AT&T

MERLIN LEGEND ™

Communications System

System Reference

ERRATA

MERLIN LEGEND™ Communications System
System Reference
555-610-110

Ignore all references to the *small* processor module. The MERLIN LEGEND™ Communications System offers only one procssor module. This processor module is referred to as a *large* processor module in this document.

Ignore references to the "small" processor module on the following pages:

Page 1-21, System Capacities.

Page 2-105, Direct-Line Console. Table 2-4, Maximum Number of System Operator Positions.

Page 2-112, Directory, Considerations. third bullet from top and third bullet from bottom of page.

Page 2-131, Direct Station Selector, Considerations, second bullet

Page 2-251, Paging, Considerations, third bullet

Page 2-294, Queued Call Console, Table 2-13, Maximum Number of System Operator Positions and fifth bullet

Page 2-337, Speed Dial, first paragraph.

Page 2-339, Speed Dial, first, third, and eighth bullets.

Page 5-4, Processor Module, first paragraph.

Page 6-1, Capacities, first paragraph.

Pages 6-2-6-5, Table 6-1, Hardware and Software Capacities

Page 6-7, Backboard Dimensions.

Appendix A - Page A-1
Ordering Codes Table *The following Price Element Code (PECs) are not valid:*
    Small (Analog) - 6141-CUA
    Small (Digital) - 6141-CUD
    Small (Digital) - 6141-24D

Appendix A - Page A-2
Ordering Codes Table: *The following Price Element Code (PEC) is not valid:*
    Upgrade from Small to Large - 6140-USLA

October 1, 1991

Notice

Every effort was made to ensure that the information in this book was completed and accurate at the time of printing. However, Information is subject to change.

Federal Communications Commissions (FCC) Information

For important FCC interference, registration, and repair information, see "Customer Support Information" in this book.

Support Telephone Number

AT&T provides a toll-free customer Helpline (1-800-628-2888) 24 hours a day (U.S.A. only). Call the helpline, or your authorized dealer, if you need assistance when installing, programming, or using your system.

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The exclamation point in an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

IMPORTANT SAFETY INSTRUCTIONS

When installing telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, eliectric Shock, and injury to persons, including:

- Read and understand all instructions.
- Follow all warnings and instructions marked on or packed with the product.
- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in a wet location unless the jack is specifically designed for wet locations.
- Never touch uninsulated telephone wires or terminals unless the telephone wiring has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Use only AT&T manufactured MERLIN LEGEND™ circuit modules, carrier assemblies, and power units in the MERLIN LEGEND (511A) control unit.
- Use Only AT&T-recommended/approved MERLIN LEGEND accessories.
- if equipment connected to the analog station modules (008/408/408 GS/LS) or to the MLX telephone module (008 MLX) is to be used for in-range out-of-building (IROB) applications, IROB protectors are required.
- Do not install this product near water, for example, in a wet basement location.
- Do not overload wall outlets as this can result in the risk of fire or electric shock.
- The MERLIN LEGEND is equipped with a three-wire grounding-type plug, a plug having a third (grounding) pin. This plug wlli fit only into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.
- The MERLIN LEGEND system requires a supplementary ground.
- Do not attach the power supply cord to building surfaces. Do not allow anything to rest on the power cord. Do not locate this product where the cord wll be abused by persons walking on it.
- Slots and openings in the module housings are provided for ventilation. To protect this equipment from overheating, do not block these openings.
- Never push objects of any kind into this product through module openings or expansion slots, as they may touch dangerous voltage points or short-out parts, which could result in a risk of fire or electric shock. Never spill liquid of any kind on this product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners on this product. Use a damp cloth for cleaning.

Customer Support Information

Support Telephone Number

AT&T provides a toll-free customer Helpline (1-800-628-2888) 24 hours a day (U.S.A. only). Call the Helpline, or your authorized dealer, if you need assistance when installing, programming, or using your system.

Federal Communications Commission (FCC)
Electromagnetic Interference Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Canadian Department of Communications (DOC)
Interference Information

This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant Ies limites applicables aux appareils numériques de la classe A prescribes dens Ie Règlement sur Ie brouillage radioélectrique édicté par le ministère des Communications du Canada.

FCC Notification and Repair Information

This equipment is registered with the FCC in accordance with Part 68 of its rules. In compliance with those rules, you are advised of the following:

■ **Means of Connection.** Connection of this equipment to the telephone network shall be through a standard network interface jack: USOC RJ11C, RJ14C, RJ21X. Connection to E&M tie trunks requires a USOC RJ2GX. Connection to off-premises stations requires a USOC RJ11C or RJ14C. Connection to 1.544 Mbs digital facilities must be through a USOC RJ48C or RJ48X. Connection to DID requires a RJ11C, RJ14C or RJ21X. These USOCS must be ordered from your telephone company.

   This equipment may not be used with party lines or coin telephone lines.

■ **Notification to the Telephone Companies.** Before connecting this equipment, you or your equipment supplier must notify your local telephone company's business office of the following:

   ■ The telephone number(s) you will be using with this equipment.

   ■ The appropriate registration number and ringer equivalence number (REN), whlch can be found on the back or bottom of the control unit, are as follows:

      If this equipment is to be used as a Key System, report the following number AS593M-72914-KF-E, and if the system provides both manual and automatic selection of incoming/outgoing access to the network, report AS593M-72682-MF-E. The ringer equivalence number for both systems is 1.5A.

   ■ For tie line connection, provide the telephone company the facility interface code (FIC) of TL31M and the service order code (SOC) 9.0F.

- For connection to off-premises stations, report the FIC 0L13C and SOC 9.0F.

- If this equipment is to be connected to digital service (1.544 Mbs), the FIC is 04DU9-B for D4 training format or 04DU9-C for extended framing format, and SOC 6.0P.

- If this equipment is to be connected to DID facilities, the FIC is 02RV2-T, and the SOC is 9.0F.

- The quantities and USOC numbers of the jacks required.

- For each jack, provide the sequence in which lines are to be connected: the type lines, the FIC, and REN by position when applicable.

You must also notify your local telephone company if and when this equipment is permanently disconnected from the line(s).

The REN is used to determine the quantity of devices which maybe connected to the telephone line. Excessive REN's on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all, areas the sum of the REN's should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REIN's, contact the telephone oornpany to determine the maximum REN for the calling area.

Installation and Operational Procedures

The manuals for your system contain information about installation and operational procedures.

- **Repair Instructions.** If you experience trouble because your equipment is malfunctioning, the FCC requires that the equipment not be used and that it be disconnected from the network until the problem has been corrected. Repairs to this equipment can be made only by the maufacturers, their authorized agents, or by others who may be authorized by the FCC. In the event repairs are needed on this equipment please contact the National Service Assistance Center (NSAC) at 1-800 626-2666, or your authorized AT&T dealer.

- **Rights of the Local Telephone Company.** If this equipment causes harm to the telephone network, the local telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if adadvance notice is not practical, you will be notified as soon as possible. You will also be informed of your right to file a complaint with the FCC.

  Your local telephone oompany may make changes in its facilities, equipment operations, or procedures that affect the proper functioning of this equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

- **Hearing Aid Compatibility.** The custom telephone sets for this system are compatible with inductively coupled hearing aids as prescribed by the FCC.

- **Automatic Dialers.** WHEN PROGRAMMING EMERGENCY NUMBERS AND/OR MAKING TEST CALLS TO EMERGENCY NUMBERS:

  - Remain on the line and briefly explain to the dispatcher the reason for the call.

  - Peform such activities in the off-peak hours, such as ealy morning or late evening.

DOC Notification and Repair Information

NOTICE: The Canadian Department of Communications (DOC) label identities certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The DOC does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to connectit to the facilities of the local telecommunications company. The equipment , must also be installed using an acceptable method of connection. In some cases, the company's inside wiring for single-line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or any equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority or electrician, as appropriate.

To prevent overloading, the Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop used by the device. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100.

DOC Certification No. 230 4095A
CSA Certification No. LR 56260
Load No. 6

Renseignements sur la notification du ministère des Communications du Canada et la réparation
AVIS: L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conform à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas qua le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le rmatériel doit également être installé en suivant une méthode acceptée de raccordernent. Dans certains cas, les fils intérieurs de l'nterprise utilises pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dspositif homologué de raccordement (cordon prolongateur téléphonique interne). L'abonné ne doit pas oublier qu'il est possible qua la conformité aux conditions énoncées ci-dessus n'empëchent pas la dégradation du service dens certaines situations. Actuellement, les entreprises de télécommunication ne permettent pas que l'on raccorde leur matériel à des jacks d'abonné, sauf dans les cas précis prévus par les tarifs particuliers de ces entreprises.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé dèsigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièbrement irnportante dans les régions rurales.

AVERTISSEMENT: L'utilisateur ne doit pas tenter de faire ces raccorderments lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, salon le cas.

L'indice de charge (IC) assigné à chaque dipositif terminal indique, pour éviter toute surchage, le pourcentage de la charge totale qui peut être raccordée à un circuit téléphonique bouclé uilisé par ce dipositif. La terminaison du circuit bouclé peut être constituée de n'irnporte quelle combinaison de dispositifs, pourvu qua la somme des indices de charge de l'ensemble des dispositifs ne dépasse pas 100.

No d'homologation 230 4095A
Node certification CSA: LR 56260
L'indice de charge: 6

MERLIN LEGEND™ D.O.C. Location Label Placement

Ministèrè des Communications du Canada emplacement de l'étiquette

AT&T   MERLIN LEGEND ™

Model 511A Control Unit

® LR 56260

**LISTED TELEPHONE
538E EQUIPMENT**

MADE IN USA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Complies with Part 68, FCC Rules, FCC Reg. No. AS593M-72682-MF-E. Ringer Equivalence 1.5A. When equipped with the "KF" option (key only), FCC Reg. No. AS593M-72914-KF-E, Ringer Equivalence 1.5A.

Use only AT&T manufactured MERLIN LEGEND circuit modules, carrier assemblies, and power units, as specified in the Installation manual, in this product. There are no user serviceable parts inside. Contact your authorized agent for service and repair.

This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

WARNING: If equipment is used for out-of-building applications, approved secondary protectors are required. See Installation Manual.

AVERTISSEMENT: Si l'equipment est utilise pour des applications exterieures, l'installation d'un protecteur secondair est requise. Voir le manuel d'installation.

CANADA

DR ID

Security of Your System-Preventing Toll Fraud

As a customer of a new telephone system, you should be aware that there exists an increasing problem of telephone toll fraud. Telephone toll fraud can occur in many forms, despite the numerous efforts of telephone companies and telephone equipment manufacturers to control it. Some individuals use electronic devices to prevent or falsify records of these calls. Others charge calls to someone else's number by illegally using lost or stolen calling cards, billing innocent parties, clipping on to someone els's line, and breaking into someone else's telephone equipment physically or electronically. In certain instances, unauthorized individuals make connections to the telephone network through the use of remote access features.

The Remote Access feature of your system, if you choose to utilize it. permits off-premises callers to access the system from a remote telephone by using an 800 number or a 7- or 10- digit telephone number. The system returns an acknowledgement signaling the user to key in his or her authorization code, which is selected and administered by the system manager. After the authorization code is accepted, the system returns dial tone to the user. If you do not program specific egress restrictions, the user will be able to place any call normally dialed from a telephone associated with the system. Such an off-premises network call is originated at, and will be billed from, the system location.

The Remote Access feature, as designed, helps the customer, through proper administration, to minimize the ability of unauthorized persons to gain access to the network. Most commonly, phone numbers and codes are compromised when overheard in a public location, through theft of a wallet or purse containing access information, or through carelessness (writing codes on a piece of paper and improperly discarding it). Additionally, hackers may use a computer to "dial" an access code and then publish the information to other hackers. Enormous charges can be run up quickly. It is the customer's responsibility to take the appropriate steps to property implement the features, evaluate and administer the various restriction levels, protect access codes, and distribute access codes only to individuals who have been fully advised of the sensitive nature of the access information.

Common carriers are required by law to collect their tariffed charges. While these charges are fraudulent charges made by persons with criminal intent, applicable tariffs state that the customer of record is responsible for payment of all long-distance or other network charges. AT&T cannot be responsible for such charges and will not make any allowance or give any credit for charges that result from unauthorized access.

To minimized the risk of unauthorized access to your communications system:

- Use a nonpublished Remote Access number.

- Assign authorization codes randomly to users on a "need-to-have" basis, keeping a log of ALL authorized users and assigning one code to one person.

- Use random sequence authorization codes, which are less likely to be easily broken.

- Deactivate all unassigned codes promptly.

- Ensure that Remote Access users are aware of their responsibility to keep the telephone number and any authorization codes secure.

- When possible, restrict the off-network capability of off-premises callers, via use of Call Restrictions and Disallowed List capabilities.

- When possible, block out-of-hours calling.

- Frequently monitor system call detail reports for quicker detection of any unauthorized or abnormal calling patterns.

- Limit Remote Call Forward to persons on a "need-to-have" basis.

Limited Warranty and Limitation of Liability

Limited Warranty

AT&T warrants to you, the customer, that your MERLIN LEGEND Communications System will be in good working order on the date AT&T or its authorized reseller delivers or installs the system, whichever is later ("Warranty Date"). If you notify AT&T or its authorized reseller within one year of the Warranty Date that your system is not in good working order, AT&T will without charge to you repair or replace, at its option, the system components that are not in good working order. Repair or replacement parts may be new or refurbished and will be provided on an exchange basis. If AT&T determines that your system cannot be repaired or replaced, AT&T will remove the system and, at your option, refund the purchase price of your system, or apply the purchase price towards the purchase of another AT&T system.

If you purchased your system directly from AT&T, AT&T will perform warranty repair in accordance with the terms and conditions of the specific type of AT&T maintenance coverage you selected. A written explanation of AT&T's types of maintenance coverage may be obtained from AT&T by calling 1-800-247-7000. If you purchased your system from an AT&T authorized reseller, contact your reseller for the details of the maintenance plan applicable to your system.

lThis AT&T limited warranty covers damage to the system caused by power surges; including power surges due to lightning.

The following will not be deemed to impair the good working order of the system. and AT&Twill not be responsible under this limited warranty for damages resulting from

■ failure to follow AT&T's installation, operation, or maintenance instructions

■ unathorized system modification, movement or alteration

■ unauthorized use of common carrier communication services accessed through the system

■ abuse, misuse, or negligent acts or omissions of the customer and persons under the customer's control

■ acts of third parties and acts of God

AT&T'S OBLIGATION TO REPAIR, REPLACE OR REFUND AS SET FORTH ABOVE IS YOUR EXCLUSIVE REMEDY.

EXCEPT AS SPECIFICALLY SET FORTH ABOVVE AT&T, ITS AFFILIATES, SUPPLIERS, AND AUTHORIZED RESELLERS MAKE NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIM ANY WARRANTIES OF MERCHANTABILIiY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF LIABILITY

EXCEPT FOR PERSONAL INJURY, DIRECT DAMAGES TO TANGIBLE PERSONAL PROPERTY PROXIMATELY CAUSED BY AT&T, AND LIABILITY OTHERWfSE EXPRESSLY ASSUMED IN A WRITTEN AGREEMENT SIGNED BY AT&T, THE LIABILTY OF AT&T, ITS AFFILIATES, SUPPLIERS AND AUTHORIZED RESELLERS FOR ANY CLAIMS, LOSSES, DAMAGES OR EXPENSES FROM ANY CAUSE WHATSOEVER (INCLUDING ACTS OR OMISSIONS OF THIRD PARTIES) REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT OR OTHERWISE, SHALL NOT EXCEED AN AMOUNT EQUAL TO THE LESSER OF THE DIRECT DAMAGES PROVEN OR THE PURCHASE PRICE OF THE SYSTEM. IN NO EVENT SHALL AT&T OR ITS AFFILIATES, SUPPLIERS OR AUTHORIZED RESELLERS BE LIABLE FOR INCIDENTAL RELIANCE CONSEQUENTLY, OR ANY OTHER INDIRECT LOSS OR DAMAGE (INCLUDING LOST PROFITS OR REVENUES) INCURRED IN CONNECTION WITH THE SYSTEM. THIS LIMITATION OF LIABILITY SHALL SURVIVE FAILURE OF THE EXCLUSIVE REMEDY SET FORTH IN THE LIMITED WARRANTY ABOVE.

About This Book

This book provides general technical information about the communications system. It is intended for persons who plan, implement, coordinate, and manage the system (called system managers).

Related Documentation

The following books are available to help you set up, use, and maintain the communications system:

- reference
- setup and modification
- telephone user support
- operator guides
- miscellaneous

How to Order Books

The books needed for operating the communications system were supplied with the system. You can order additional copies of these and other books listed below from the AT&T Customer Information Center:

■ Within the continental United States, call 1-800-432-6600.

■ In Canada, call 1-800-255-1242.

MERLIN LEGEND Book Title	**Order Number**
System Reference	
System Reference	555-610-110
System Setup and Modification	
Key System Planning	555-610-112
Key System Planning Forms	555-610-116
PBX System Planning	555-610-113
PBX System Planning Forms	555-610-117
Data Guide	555-610-114
Data Planning Forms	555-610-118
System Progamming	555-610-111
Telephone User Support	
Analog Multiline Telephones User's Guide	555-610-120
MLX-10D,™ MLX-28D,™ and MLX-20L™ Digital/ISDN Display Telephones User's Guide	555-610-122
MLX-10™ Digital/ISDN Non-Display Telephone User's Guide	555-610-123
MLX-10™ and MLX-10D™ User Cards	555-610-124
MLX28D™ and MLX-20L™ User Cards	555-610-125
Single-Line Telephones User's Guide	555-610-121
Operator Guides	
Analog Direct-Line Consoles Operator's Guide	555-610-131
Digital-ISDN Direct-Line Consoles Operator's Guide	555-610-132
Digital-ISDN Queued Call Console Operator's Guide	555-610-133
Miscellaneous	
Calling Group Supervisor's Guide	555-610-130

Additional Ordering Information

For information on ordering replacement parts, accessories, and other equipment that is compatible with the system, see Appendix A in *System Reference.*

Product Safety Labels

Throughout this book, hazardous situations are indicated by an exclamation point inside a triangle, along with the word caution or warning.

⚠ **WARNING:**

Warning indicates the presence of a hazard that could cause death or severe personal injury if the hazard is not avoided.

⚠ **CAUTION:**

Caution indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.

How to Comment on This Book

We welcome your feedback on this book. Please use the feedback form that follows. If the form is missing, send your comments to A. Sherwood, AT&T, 99 Jefferson Road, Rm. #2A25, Parsippany, NJ 07054.

System Overview

1

The **MERLIN LEGEND™** Communications System is an advanced digital switching system that integrates voice and data communications features. Voice features combine traditional telephone features, such as Transfer and Hold, with advanced features, such as Group Coverage and Park. Data features enable the transmission of voice and data over the same system wiring.

This chapter describes the following aspects of the system.

■ Components-the equipment that makes up the system

■ Capabilities-the voice, data, and call-handling capabilities of the system

■ Programming-the methods and equipment used in system programming

Components

The system consists of required and optional components:

■ required components

■ control unit

■ telephones

■ optional components

■ adjuncts

■ adapters

■ applications

Figure 1-1 on page 4 shows the components of the system. The numbered paragraphs following the figure correspond to the numbered items in the figure.

Control Unit

The control unit consists of the basic carrier and any expansion carriers. These include the processor module, power supply modules, and line/trunk and station modules. (See Chapter 5, "Hardware," for a detailed description.)

Telephones

The telephones that can be used with the system are the digital/ISDN (MLX) telephones, the analog multiline telephones (including cordless telephones), and the single-line telephones. (See Chapter 5, "Hardware," for a detailed description.)

Adjuncts

Adjuncts are pieces of equipment that connect directly to the control unit or to a telephone through an adapter (see "Adapters" below). Answering machines, credit card verification terminals, and alerts are examples of adjuncts. For more information on adjuncts, see Chapter 5, "Hardware."

Adapters

Adapters enable the connection of equipment or, in the case of a channel service unit (CSU), of Digital Signal 1 (DS1) facilities to the control unit. Some adapters oonnect directly to the control unit (system adapters) while others connect to telephones (telephone adapters):

■ **System Adapters**

  ■ ESF T1 CSU

  ■ 551 T1 L1 CSU

  ■ Universal Paging Access Module (UPAM)

■ **Telephone Adapters**

  ■ Multi-Function Module (MFM) for MLX telephones

  ■ General Purpose Adapter (GPA) for analog multiline telephones

  ■ ISDN 7500B Data Module for connecting digital data equipment either directly to the control unit or to an MLX telephone (for simultaneous voice and data transmission)

  ■ modem for connecting digital equipment (such as a personal computer) to a tip/ring (T/R) interface

  ■ Supplemental Alert Adapter (SAA) for connecting an alert (such as a horn or strobe) to an analog multiline telephone

Applications

Applications for the MERLIN LEGEND Communications System consist of software and/or hardware that add functions to the system:

■ Call Accounting System (CAS)

■ Call Accounting Terminal (CAT)

■ Call Management System (CMS)

■ Integrated Solution II (IS II)

  ■ AUDIX Voice Power — IS II

  ■ Integrated Voice Power Automated Attendant

  ■ Call Accounting System — IS II

  ■ System Programming and Maintenance — IS II

■ MERLIN MAIL™ Voice Messaging System

■ MERLIN® Attendant

■ System Programming and Maintenance (SPM)

See Chapter 3, "System Applications," for descriptions.
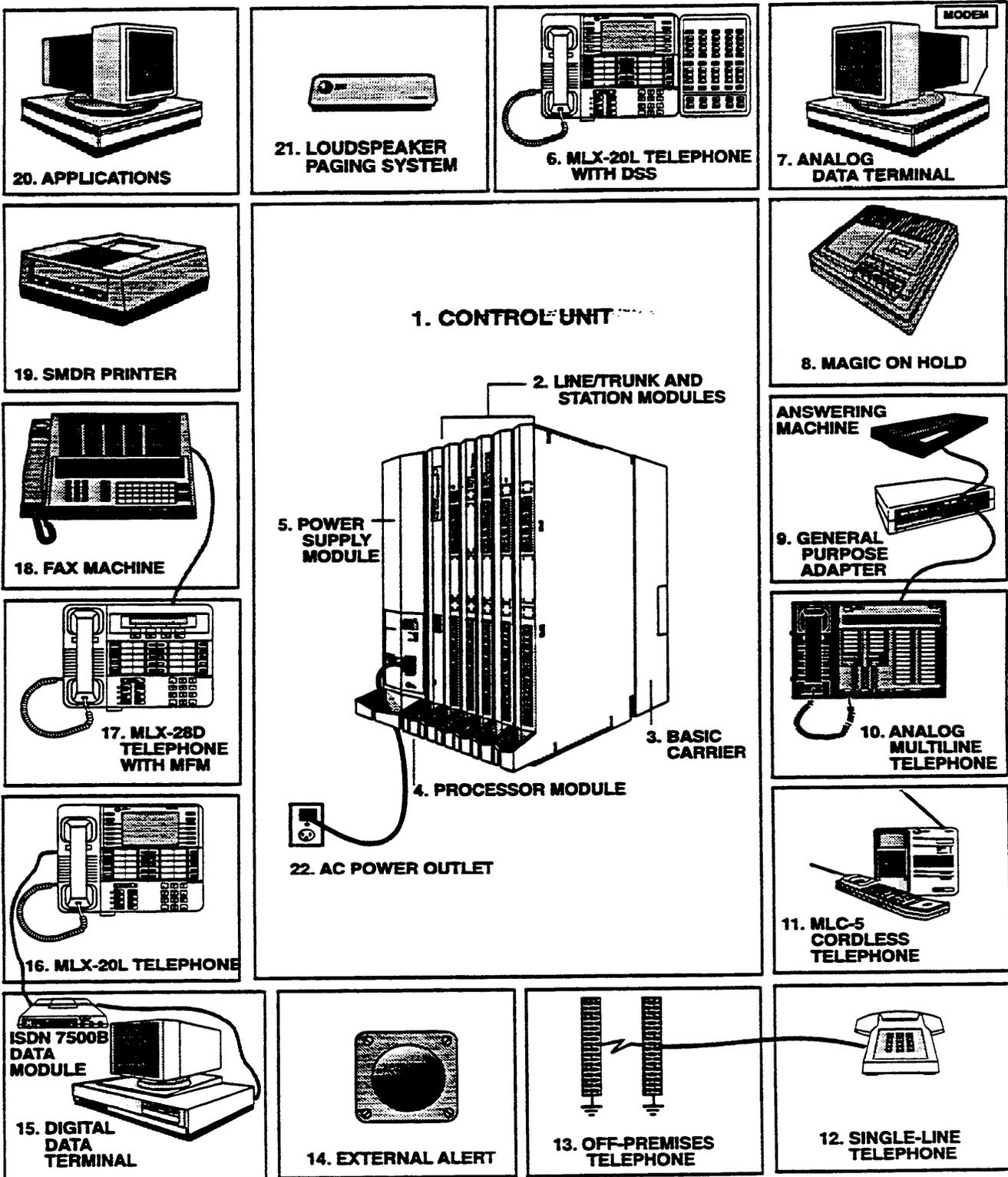
Figure 1-1 System Components

1. **Control Unit.** The backbone of the system, consisting of the basic and expansion carriers, power supply module, processor module, and line/trunk and Station modules. The control unit connects telephone company lines/trunks with stations such as telephones and adjuncts,

2. **Line/Trunk and Station Modules.** The components that connect telephone company lines/trunks and terrninal equipment such as telephones, external alerts, and fax machines via jacks to the control unit.

3. **Carrier (Basic).** The component attached to the backboard used to hold the modules needed for system operation. The basic carrier houses the processor module, power supply module, and up to five line/trunk and station modules. Each expansion carrier houses its own power supply module and up to six additional line/trunk and/or station modules. One or two expansion carriers can be added.

4. **Processor Module.** A miniature computer that controls most of the system's features, and supplies the system's diagnostics. The processor module provides two jacks, one for Station Message Detail Recording (SMDR) and the other for system programming and maintenance via a personal computer (PC).

5. **Power Supply Module.** The component that supplies DC power for the modules and telephones (one power supply unit is needed per carrier). If the system's power requirements exceed the capacity of the power supply module, an auxiliary power supply unit can be added.

6. **Direct Station Selector (DSS).** A console that adds 50 buttons for one-touch extension dialing to the MLX-20L™ or MLX-28D™ telephone and speeds call handling.

7. **Analog Data Station.** A data terminal such as a PC, printer, or optical reader that connects, via a modem (for transmitting and receiving analog signals), to a 012 basic telephone module or a 008 OPT module. A data terminal can also be connected to an MLX telephone using a Multi-Function Module (MFM) or to an analog multiline telephone using a General Purpose Adapter (GPA).

8. **Magic on Hold®.** Optional equipment that connects to the system through a ground-start/loop-start (GS/LS) jack programmed for Music-on-Hold. (A customer-provided music source can be connected instead of Magic on Hold.)

9. **General Purpose Adapter (GPA).** An adapter used to connect a variety of tip/ring (T/R) adjuncts to an analog multiline telephone (shown here with an answering machine).

10. **Analog Multiline Telephone.** A 34-button telephone with built-in speakerphone that connects to the system via an analog station jack. Other analog multiline telephones compatible with the system include the 22- and 34-button with built-in speakerphone and a one-line, 16-character display, and the 10- and 22-button with built-in speakerphone, without display.

11. **MLC5 Cordless Telephone.** A cordless multiline telephone that connects to the control unit via an analog station jack.

12. **Industry-Standard Single-Line Telephone.** A touch-tone or rotaty industry-standard telephone connected to the system via 012 basic telephone module or a 008 OPT module.

Components **1-5**

13. **Off-Premises Telephone (OPT).** A single-line, touch-tone or rotary, industry-standard telephone located in a different building from the control unit.

14. **External Alert.** Alerting devices such as bells, chimes, and strobe lights that connect to a jack on a 012 basic telephone module or a 008 OPT module, or to an MFM or Supplemental Alert Adapter (SAA)

15. **Digital Data Station.** A data terminal such as a PC, printer, or optical reader that connects via an ISDN 7500B Data Module to a 008 MLX module and that can also include an MLX telephone.

16. **MLX-20L™ Telephone.** A digital/ISDN (MLX) telephone with 20 line buttons and a display with seven lines of 24 characters each. The MLX-20L telephone can be used as a system programming console. Other MLX telephones:

    ■ **MLX-10™/MLX-10D™Telephone.** A 10-button MLX telephone with or tele without a two-line, 24-character display.

    ■ **MLX-28D™ Telephone.** An MLX telephone with 28 line buttons and a two-line, 24-character display.

17. **Multi-Function Module (MFM).** A circuit board mounted inside an MLX telephone that provides a jack to connect optional equipment such *as* answering machines, fax machines, external alerts, and modems to the telephone.

18. **Fax.** Industry-standard fax machines connected to the control unit via a jack on a 012 basic telephone module or a 008 OPT module, an MFM, or a GPA.

19. **SMDR Printer.** A printer for SMDR call records, connected via an RS-232 jack on the processor module.

20. **Applications.** Software and hardware for the MERLIN LEGEND Communications System that can be connected to the control unit to provide more functions.

21. **Loudspeaker Paging.** A single-zone or multizone system such as PagePac* with Zonemate† 9 or 39 that connects via an administered jack on a GS/LS module.

22. **AC Power Outlet.** A dedicated 115-VAC wall outlet (not controlled by an on/off switch) that supplies power to the control unit.

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* **PagePac is a registered trademark of Dracon, a division of Harris Corporation.**
† Zonemate is a trademark of Dracon, a division of Harris Corporation.

Capabilities

The following system capabilities are described in this chapter:

■ modes of operation

■ data

■ network

■ system capacities

■ DS1 capabilities

Modes of Operation

The system is for customers in the 10 to 140-station range. It can be configured to operate in one of three modes:

■ Key

■ Hybrid/PBX

■ Behind Switch

See "Modes of Operation" in Chapter 4 for a functional description of the modes.

Key Mode

In the Key mode, every line appears on a separate button on each multiline telephone. The line buttons allow users to see activity on other telephones, join conversations, make calls, and receive calls. Separate intercom buttons are used to make and receive internal calls.

A Key system automatically assigns the first eight outside lines to all telephones. Through system programming this arrangement can be customized to allow more outside line appearances on telephones. Also, lines or groups of lines can be assigned to selected groups of telephones or to individual telephones.

Hybrid/PBX Mode

The Hybrid/PBX mode handles a large volume of calls and users and provides the most flexibility of the three modes. The outside trunks can be grouped in pools for shared use. in addition, outside trunks can be assigned to line buttons on multiline telephones for users who need a personal line.

Users access inside lines and outside trunks via System Access buttons. To make an outside call, the user enters a dial-out code, usually a 9, and the system automatically selects an available trunk. The Automatic Route Selection (ARS) feature determines which trunk should be used for each type of outgoing call.

Incoming calls can be handled by either a direct-line console (DLC) or a queued call console (QCC), or by a combination of both.

Behind Switch Mode

The Behind Switch mode is used when the System is connected to a PBX or Centrex system. This other system (called the host) provides the interface to outside lines and some features.

A Behind Switch system assigns only one line (called a prime line) to each telephone. Outside lines to telephones or groups of telephones are assigned through system programming.

In the Behind Switch mode, users have access to the special features of both their system and the host system.

Lines/Trunks by Mode

Different types of lines/trunks are used for the different functions of each mode.

A Key or Behind Switch system can use

■ loop-start lines

■ tie trunks

■ a DS1 facility programmed for either T1 or ISDN-PRI operation

■ a ground-start line only when registered under the MF FCC classification

A Hybrid/PBX system can use

■ loop-start trunks

■ ground-start trunks

■ tie trunks

■ Direct Inward Dialing (DID) trunks

■ a DS1 facility programmed for either T1 or ISDN-PRI operation

Data Capabilities

For more information on data communication hardware requirements, feature descriptions, planning, programming, and using data communications equipment, see the Data Guide.

The system can provide data connections between two digital data modules (ISDN 7500B Data Modules), between two analog modems, or between an analog modem and a digital data module. The system can also provide access to an in-house host computer or to a data station on a network.

Data facilities include

■ digital data endpoints - RS-232 and V.35 interfaces via ISDN 7500B Data Modules

■ analog data endpoints - T/R modem interfaces

■ local host computer and workstation on local area network (LAN) access

■ DS1 facility interface

Data Stations

A data station is any location that includes a data terminal (such as a personal computer, printer, or fax machine) connected to the system via a modem or a data module, such as an ISDN 7500B Data Moduie. The modem or data module transmits information to and from the data terminal and, in many cases, provides dialing and answering capability. During data communications, a modem or data module functions similarly to the way a telephone functions during voice communications-it makes, maintains, and ends a call.

The two types of data stations that can be connected to the system are analog and digital. Both types can include a telephone for users who require simultaneous voice and data capability.

■ **Analog Data Station** uses a modem to convert the digital signals from the data terminal to analog signals, which are then transmitted as continuous electrical waves in the voice frequency band. The modem makes, receives, or maintains the data call; it transmits or receives analog data over the regular telephone company network or from another data station inside the system.

An analog data station can be connected directly to the control unit via a jack on a 012 or a 008 OPT module. If the data station includes an analog multiline telephone, the modem is connected to the telephone by using a General Purpose Adapter. If the data station includes an MLX telephone, the modem is connected by using a Multi-Function Module (MFM).

■ **Digital Data Station** uses a data module such as an ISDN 7500B Data Module to transmit digital signals as a sequences of separate electrical pulses. The data module serves as an interface between the data terminal and the system's control unit and is used to make, receive, or maintain the data calls. The data module transmits and receives data over telephone company digital facilities, such as Integrated Services Digital Network Primary Rate interface (ISDN-PRI), or from another digital data station inside the system.

A digital data station connects through a 2- or 4-pair cable to a jack on a 008 MLX module in the control unit.

Data Station Uses

Both analog and digital data stations can be configured for data communications with

■ an individual data terminal (computer, printer, or fax machine)

■ a mainframe computer

■ a workstation on a LAN (a network of interconnected computers or terminals)

Data calls can be made between data stations. Calls between analog data stations or calls between digital data stations are possible without additional equipment. Calls between an analog data station and a digital data station are possible only if the system includes a conversion resource called a modem pool.

A modem pool is a pairing of a modem and a data module that allows data calls between dissimilar data stations by converting signals from analog to digital or digital to analog. Calls between analog and digital stations are made in two stages. The data call is made to the extension for the modem pool, and when the data call is connected, the user dials the extension or telephone number (including dial-out code if required) for the data station being called.

Depending on the type of voice and data transmission, data stations are configured with different combinations of data and telephone equipment (see Table 1-1).

Note: There is no analog voice and digital data configuration.

Table 1-1   Configurations of Data Stations

| Type of Data Station | Equipment Configuration | | | | | Type of Module |
	Computer or Terminal	Modem	ISDN Data Module	Analog Telephone	MLX Telephone	
Analog voice and analog data	✔	✔		✔●		008, 408, 408 GS/LS
Analog data only	✔	✔				012, 008 OPT
Digital voice and analog data	✔	✔			✔†	008 MLX
Digital voice and digital data	✔		✔		✔	008 MLX
Digital data only	✔		✔			008 MLX

● Requires a GPA

† Requires an MFM

Data Communications Components

Following are examples of configurations of voice and data equipment commonly connected to the system. The accompanying text describes the equipment and how it is connected to the control unit.

Individual Use Data Station

Figure 1-2 shows configurations for data stations intended for individual use.
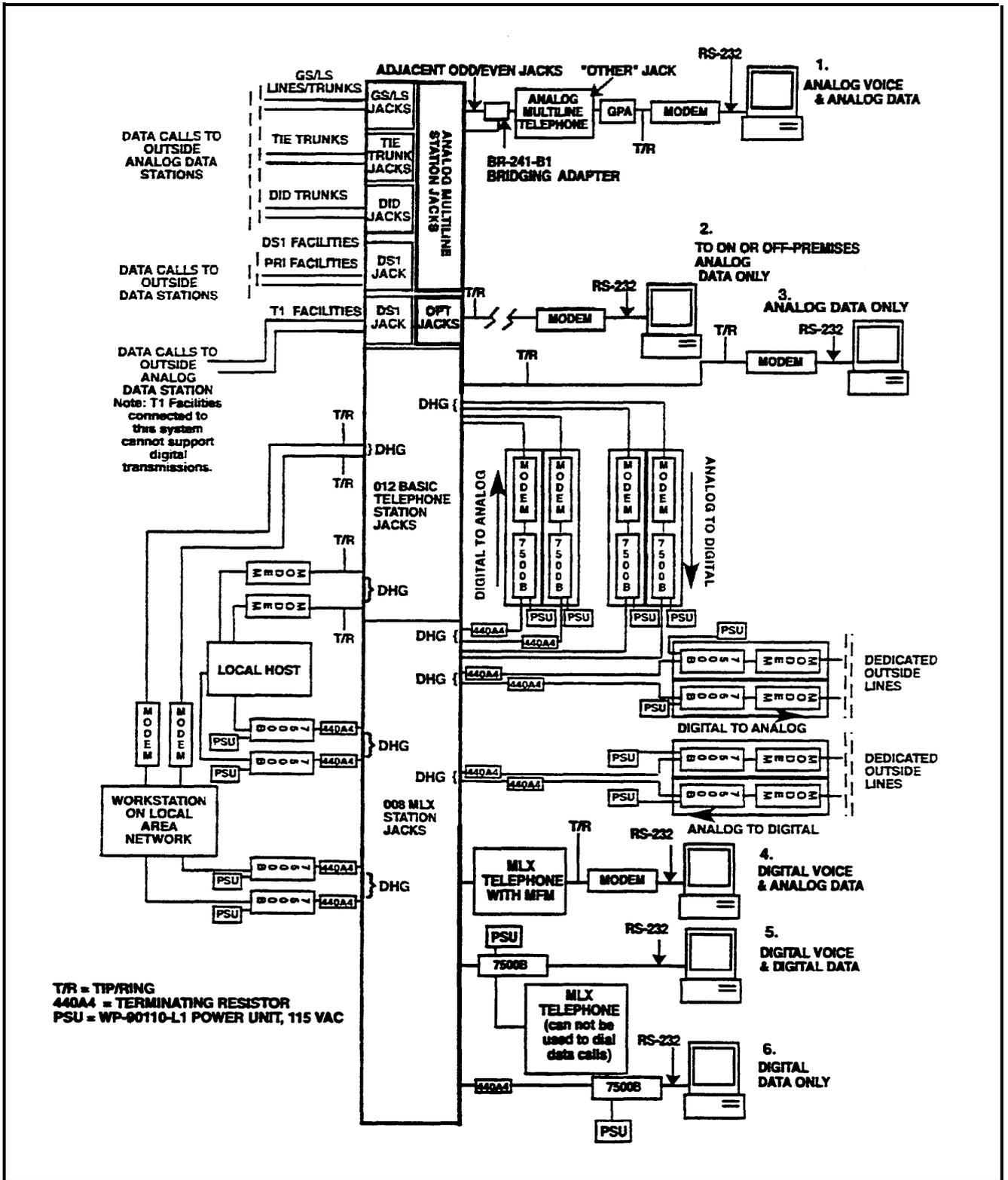
Figure 1-2 Individual Used Data Station Configurations

1. **Analog Voice and Analog Data Station** includes a data terminal, a modem, and an analog multiline telephone. A GPA is required to supply the tip/ring (T/R) interface for the modem.

   To provide the Simultaneous Voice and Data feature. two adjacent station jacks on a 408, 408 GS/LS, or 008 module must be assigned.

2. **On- or Off-Premises Analog Data-Only Station** Includes a data terminal and a modem. Connection to the control unit is through an off-premises telephone jack on a 008 OPT module.

3. **Analog Data-Only Station** includes a data terminal and a modem. Connection is through a jack on a 012 (basic telephone) module on the control unit.

4. **Digital Voice and Analog Data Station** includes a data terminal, a modem, and an MLX telephone. An MFM installed in the telephone is required to supply the T/R interface to the modem.

5. **Digital Voice and Digital Data Station** includes a data terminal, an ISDN 7500B Data Module, and an MLX telephone. The ISDN 75006 Data Module supplies the RS-232 interface to the data terminal. The data station connects through a jack on a 008 MLX module.

6. **Digital Data-Station** includes a data terminal and an ISDN 7500B Data Module. When the 7500B is installed without an MLX telephone, a 440A4 terminating resistor is required. One station jack on a 008 MLX module is assigned to connect this configuration.

Modem Pools and Data Hunt Groups

A modem pool (also called a conversion resource) is made up of one or more pairings of an ISDN 7500B Data Module and a modem. Modem pools provide resources that convert digital data signals to analog, or analog data signals to digital, and allow users with different types of data stations to communicate with each other.

A data hunt group (DHG) is a group of data stations of the same type (all analog modems or all digital ISDN 7500B Data Modules) or is a group of one or more modem pool pairings. A common extension number is assigned to each group —for example, extension 771 can be assigned to the data module DHG used to communicate with the local host computer, extension 773 can be assigned to the modem DHG used to communicate with the local host computer, extension 774 can be assigned to the data module DHG used to communicate with the workstation on a LAN, and extension 775 can be assigned to the modem DHG used to communicate with the workstation on a LAN.

DHGs allow sharing of data communication resources by connecting users in a round-robin fashion to the first available data station or modem pool pairing in the group. Specific lines/trunks can also be assigned to ring directly into the DHG so that outside callers can dial a published telephone number to reach the DHG.

Figure 1-3 shows how modem pools assigned to DHGs can be configured to allow analog and digital stations to communicate with each other.

Figure 1-3 Modem Pools Assigned to Data Hunt Groups

1. **Digital-to-Analog** translates digital signals to analog signals for data calls made from a digital data station to an inside or outside analog station. In this configuration, the ISDN 7500B Data Modules are assigned to a DHG.

2. **Analog-to-Digital** translates analog signals to digital signals for data calis from an analog data station to an inside or outside digital data station. In this configuration, the modems are assigned to a DHG.

3. **Digital-to-Analog (Outgoing) on Dedicated Outside Lines** translates digital signals to analog signals for data calls from a digital data station to an outside analog station over analog dedicated outside lines. These lines are used solely for data communications. In this configuration, the ISDN 7500B Data Modules are assigned to a DHG.

4. **Analog-to Digital (Incoming) on Dedicated Outside Lines** translates analog signals to digital signals for data calls from an outside analog data station to an inside digital data station over analog dedicated outside lines. These lines are used solely for data communications.

Configurations 1 and 2 (digital-to-analog and analog-to-digital) use system lines; therefore, the modems and data modules must be connected directly to the control unit. Each modem is assigned to a jack on a 012 or 008 OPT module, and each ISDN 7500B Data Module is assigned to a 008 MLX module jack.

For configurations 3 end 4 (the digital-to-analog or analog-to-digital on a dedicated outside line), only the ISDN 7500B Data Module connects to the control unit via jacks on a 008 MLX module.

In all four configurations, a 440A4 terminating resistor is required when the 7500B is connected without an MLX telephone to the control unit.

Local Host Computer and LAN Workstation

Figure 1-4 shows data stations assigned to DHGs to provide access to a local host computer and a workstation on a LAN.

1. **Local Host Computer** configuration includes a local host computer and the modems or ISDN 7500B Data Modules that connect the local host computer to the control unit.

   The modems and data modules are connected to RS232 ports of the host computer. Each modem is assigned to a jack on a 012 module, and each ISDN 7500B Data Module is assigned to a 008 MLX module jack.

2. **Workstation on LAN** configuration includes a data terminal or computer (workstation) that is part of a LAN and modems and/or ISDN 7500B Data Modules. The LAN is either an interconnected chain of terminals or PCs that pass data to and from a mainframe computer or a network of interconnected computers.

   In Figure 1-4, the modems and data modules are arranged in DHGs to allow a sharing of data communications equipment. Data station users communicate with the local host computer or the workstation on the LAN by using the extension number assigned to the DHG.
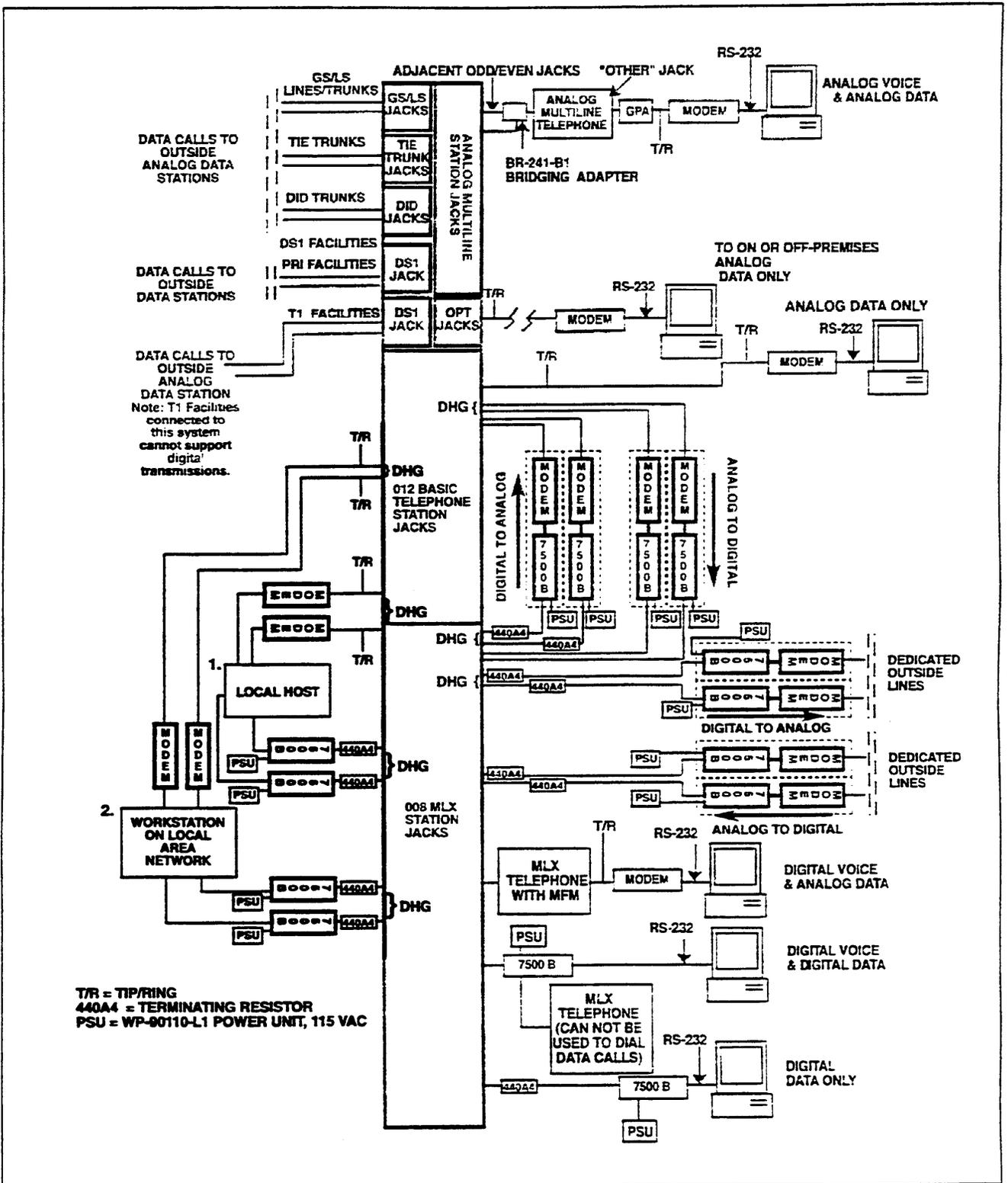
Figure 1-4 DHGs Connected to Local Host Computer and LAN Workstation

System Features for Data Communication

The following features are available to data station users through the communications system software:

■ **Modem Pool** allows data communications between digital and analog data stations.

■ **Data Hunt Group** allows users to reach a group of similar (analog or digital) data stations or a group of one or more modem pool pairings via a common extension number.

■ **Account Code Entry** allows tracking of outgoing data calls for report used for billing, forecasting, or budgets.

■ **Auto Answer All** is used when an analog data station is connected to an analog multiline telephone via a General Purpose Adapter. It allows a modem with automatic answering capability to answer data calls when the user is away from the station.

■ **Data Status** is used when a data station includes an analog multiline or MLX telephone. It monitors when data equipment is in use.

■ **Privacy** prevents loss of data by ensuring that data transmission is not interrupted accidentally. Privacy for data calls is provided automatically on digital data stations but must be manually activated on analog data stations.

■ **System Speed Dial** and **Personal Speed Dial** permit quick dialing of frequently used numbers.

Networking Capabilities

The system can connect to another system via the two control units or via tie trunks.

Control Unit to Control Unit

This system's control unit can connect to another system's control unit in three ways:

■ from an off-premises telephone (OPT) line to a loop-start line/trunk (or vice versa) via analog facilities

■ via an analog tie trunk connected on a 400EM module

■ via a digital emulated tie trunk on a DS1 facility connected on a 100D module programmed for T1 type transmission. A back-to-back connection from one DS1 facility to the other can be used when the total cable distance is fewer than 1300 feet.

OPT/Loop-Start Connection

A 008 OPT module on system A's control unit can be connected to a loop-start port on system B's control unit. This enables the user on system B to *access* all the stations and facilitiess on system A. If system B has remote access, the user on system A can directly access stations and facilities on system B without operator intervention. Conversely, a loop-start port on system A can be connected to an OPT port on system B.

Note: If the systems are on the same premises, the connection can be made to any T/R port.

With the OPT/loop-start connection, glare is more frequent as the volume of calls increases. (Glare occurs when a user tries to make an outside call on a line/trunk at the same time an incoming call is being received on that line/trunk.) In addition, if system B (the loop-start interface) does not have remote access. only the stations assigned to the loop-start facility on system B can be accessed by system A.

Analog Tie-Trunk Connection

In an analog tie-trunk connection, this systems 400EM module is connected to another system's control unit. If both systems are on the same premises, this module can be connected directly to the other system if the other system has similar tie-trunk facilities.

For off-premises connection, the 400EM module can be connected via the telephone company's facilities to another system.

The analog tie-trunk connection can be administered for two-way traffic or for one-way traffic (incoming or outgoing). The one-way mode prevents blocked calls caused by glare.

Digital Tie-Trunk Connection

The digital tie-trunk connection joins the DS1 facility (the 100D module) on the system to another system's DS1 facility. If the other system is on the same premises, the connection is back-to-back. To reach a remote system, the DS1 facility connects via a channel service unit (CSU) to the telephone company's facilities.

Tie-Trunk Networks   The tie-trunk networks that can be used with the system are
tandem, and intertandem.

Nontandem

The nontandem tie-trunk network is used primarily to connect station lines at
both ends; it does not connect to another tie trunk (see Figure 1-5).
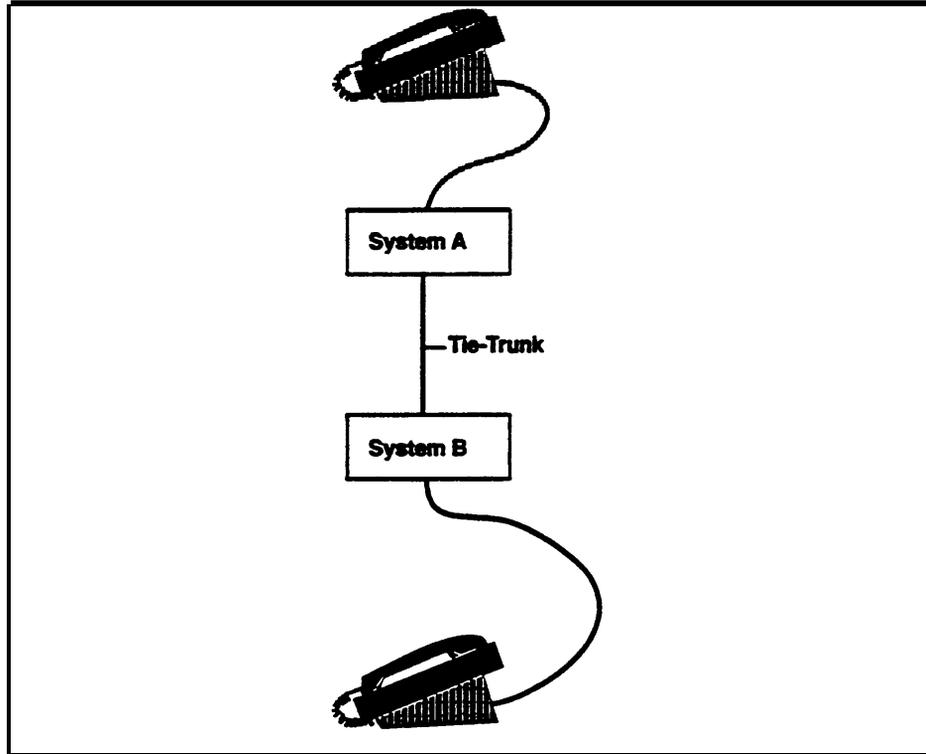
Figure 1-5 Nontandem Tie-Trunk Network

Tandem

The tandem tie-trunk network has a station on one system connected to a station on a third system via a tie-trunk connection in a second system. The tandem network also can be used to connect to an external facility in the third system, but the grade of service will be fair to poor if one or both tie trunks are analog (see Figure 1-6).
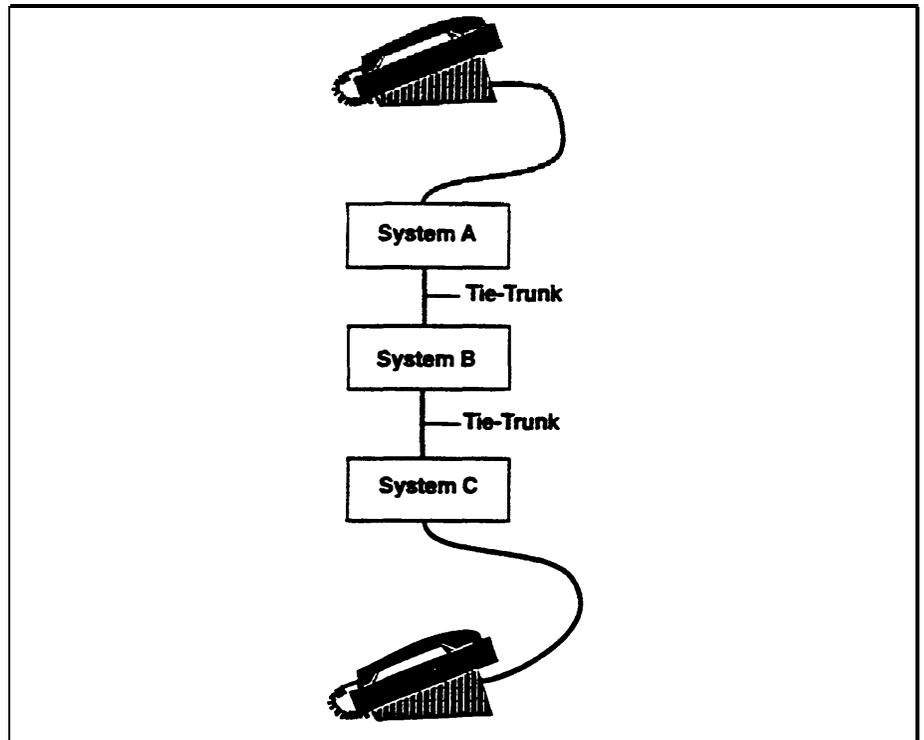
Figure 1-6 Tandem Tie-Trunk Network

Intertandem

The intertandem tie-trunk network has a tandem tie trunk connected to tie trunks at both ends. it is not recommended for analog tie trunks (see Figure 1-7).
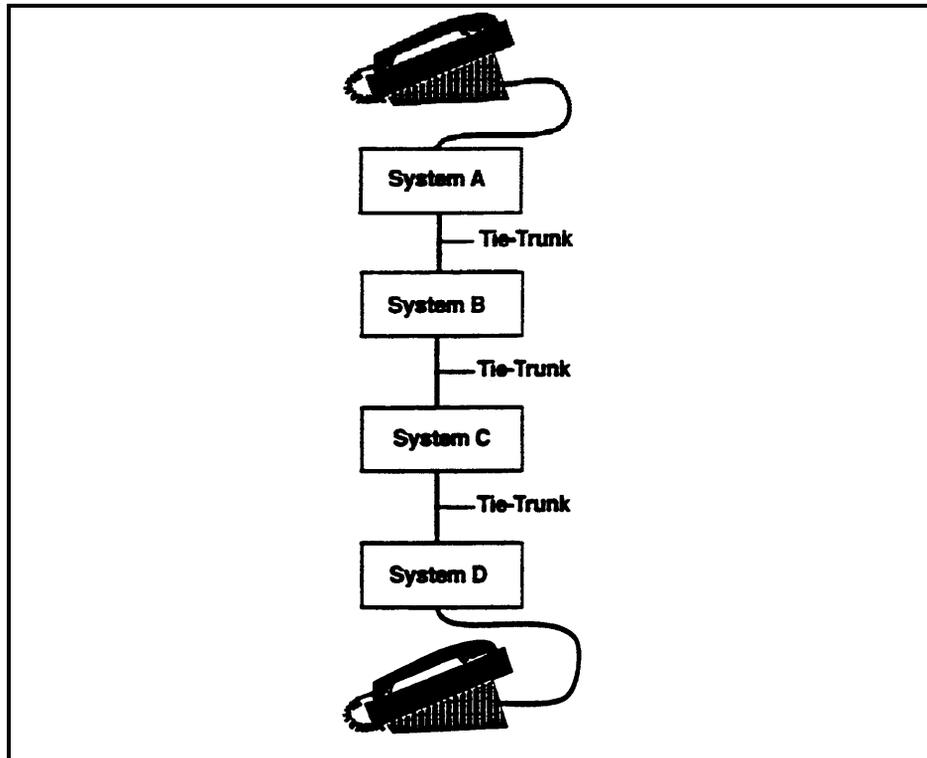
Figure 1-7 Intertandem Tie-Trunk Network

![black bar]

System Capacities

The communications system can be arranged as a stand-alone system or as part of a private network and comes in two sizes, large and small. The large system supports up to 224 jacks to connect 80 central office lines/trunks and 144 stations (such as telephones and fax machines), and the small system supports up to 80 jacks to connect 24 lines/trunks and 56 stations. The capacity of the system is determined by the size of the memory in the processor module (including the feature module) located in the control unit.

The large version of the system supports

■ up to 108 simultaneous two-party conversations (40 in the small version)

■ up to 80 line/trunk jacks (24 in the small version), including basic, DID, tie, FX, WATS, and 800 service

■ up to 255 station endpoints (56 in the small version) that support a combination of

   ■ up to 144 physical station jacks (56 in the small version) for telephones and adjuncts

   ■ up to 127 logical digital data ports (via ISDN 7500B Data Modules connected to jacks on the MLX module) providing RS-232 connections to data terminals and personal or multiport computers

See "Capacities" in Chapter 6 for a full explanation of the small and large system capacities.

DS1 Capabilities

A Digital Signal 1 (DS1) is a transmission system that carries digital signals in the DS1 format. The outside DS1 facility connects to a channel service unit (CSU), which in turn connects to the 100D module. The CSU ensures that the transmission of the 100D module matches the transmission of the outside DS1 facility. The 100D module can be programmed to handle either T1 or ISDN-PRI service.

See "DS1 Facilities " in Chapter 4 for a full explanation of how the system works in DS1 format.

System Programming

The communications system can be programmed with options for

■ basic system operating conditions

■ system renumbering

■ settings for lines/trunks

■ telephones and operator consoles

■ adjuncts

■ applications

■ optional-features

The system can be programmed by using one of the following:

■ an MLX-20L telephone connected to the first MLX module in the control unit

■ a PC with System Programming and Maintenance (SPM) software connected to the lower RS-232 port on the processor module

■ the built-in modem in the processor module, which permits remote programming via the public network. (For example, the AT&T support personnel can access the system by using a PC with a modem and with SPM software; AT&T support personnel call the system and enter a password to gain access. The system must be programmed for Remote Access.)

The programming options are accessed from display screen menus. For more information, see the System Proogramming manual.

Features

2

Introduction

This chapter describes the following types of features available with the communications system:

■ **System features** affect how the system operates and/or must be assigned through system programming.

■ **Telephone features** affect individual users (including system operators) and are either programmed through centralized telephone programming or by users from their telephones.

■ **System operator features** affect only system operators and are programmed either through centralized telephone programming or by system operators from their consoles.

The system also offers data features - features that can be programmed or used to make or receive **data** calls. Some of these features, such as Speed Dial, are also used to make or receive **voice** calls. Data-only and voice/data features are described in the *Data Guide.*

How the Information Is Presented

System, telephone, and system operator features are combined in this chapter and presented in alphabetical order. The information for each feature is presented under the following subheadings:

■ **Extension Programming** - the programming codes, feature codes, and digital/ISDN (MLX) telephone display labels that appear on the MLX telephone display while the feature is being programmed or used

■ **Description** - how the feature works and what it does for the user

■ **Telephone Differences** - differences in feature operation among telephone types

■ **Mode Differences** - functional differences of the feature in the Key, Hybrid/PBX, or Behind Switch modes of operation

■ **Considerations** - restrictions, capacities, and other information to consider before using or programming the feature

■ **Feature Interaction** — other features that must be used with, cannot work with, or modify the operation of the described feature

■ **System Programming** — the steps to activate the feature and the menu choices to reach the right screen from the System Programming menu. (See the *Planning Guide* [PBX or Key] for planning instructions and *System Programming* for system programming instructions.)

■ **Hardware Requirements** — hardware required to use features, including connectivity diagrams where applicable

■ **Related Features** — other features with similar functionality

Note: Subheadings that are not applicable are omitted-for example, if there are no mode differences, the "Mode Differences" subheading is omitted.

Feature Tables

Table 2-1 (System Features) and Table 2-2 (Telephone and System Operator Features) list all the features of the system.

System Features

System features affect how the system operates and/or must be assigned through system programming. Table 2-1 lists all the system features. the modes in which they are available, and any mode differences.

Table 2-1 System Feature

Feature	Mode			Differences
	Key	Hybrid/ PBX	Behind Switch	
Automatic Maintenance Busy	✔	✔	✔	
Automatic Route Selection (ARS)		✔		with trunk pools only
Callback	✔	✔	✔	Key and Behind Switch: not available for outside lines
Calling Restrictions	✔	✔	✔	Hybrid/PBX: can deny access to trunk pools
Delayed Ring Interval	✔	✔	✔	
Direct-Line Console (DLC) Options	✔	✔	✔	Hybrid/PBX: cannot have trunk pool access buttons
Directories	✔	✔	✔	
Direct Inward Dial Trunk Options			✔	
DS1 Module Options	✔	✔	✔	
Extension Status	✔	✔	✔	
Forced Account Code Entry	✔	✔	✔	Behind Switch: unavailable for single-line telephones Hybrid/PBX and Behind Switch: must enter account code before dial-out code
Group Call Coverage	✔	✔	✔	
Group Calling	✔	✔	✔	Behind Switch: calls do not follow the telephone company's central office ring pattern
Hold Disconnect Interval	✔	✔	✔	
Inside Dial Tone	✔	✔	✔	
Labeling	✔	✔	✔	
Line/Trunk Options	✔	✔	✔	

Table 2-1 Continued

Feature	Mode			Differences
	Key	Hybrid/ PBX	Behind Switch	
Loudspeaker Paging	✔	✔	✔	
Microphone Disable	✔	✔	✔	
Night Service	✔	✔	✔	
Paging Groups	✔	✔	✔	
Park Return Interval	✔	✔	✔	
Pickup Groups	✔	✔	✔	
Primary Rate Interface (PRI) Options	✔	✔	✔	
Queued Call Console (QCC) Options		✔		
Recall Interval	✔	✔	✔	Behind Switch: recall interval may need to be shortened
Reminder Service Cancel	✔	✔	✔	
Remote Access	✔	✔	✔	
Remote Call Forward	✔	✔	✔	Behind Switch: unavailable for single-line telephones
Station Message Detail Recording (SMDR)	✔	✔	✔	
System Numbering	✔	✔	✔	Hybrid/PBX: extension number is assigned to Listed Directory Number (the published main number) for QCC
System Speed Dial	✔	✔	✔	
Tie Trunk Options	✔	✔	✔	
Toll Type	✔	✔	✔	
Touch-Tone or Rotary Signaling	✔	✔	✔	
Transfer Options	✔	✔	✔	
Trunk Pools		✔		
Voice Announce to Busy	✔	✔	✔	

Telephone Features

Telephone features can be used by individuals (including system operators) and programmed either through centralized telephone programming or by users from their telephones {see Table 2-2).

System Operator Features

System operator features affect only system operator consoles and are programmed either through centralized telephone programming or by users from their telephones.

Table 2-2 lists all telephone and system operator features, the programming code, the feature code, the MLX display label, and the feature use by telephone and mode. Mode is indicated on the table as follows:

■ K = Key mode

■ P = Hybrid/PBX mode

■ B = Behind Switch mode

Note: System operators with queued call consoles (QCCs) can use only those features that are assigned to buttons on the console as fixed features or that can be selected from the display. QCC system operators cannot use a feature by pressing the Feature button and dialing a feature code, nor can features be programmed on buttons.

Table 2-2 Telephone and System Operator Features

Feature	Prog Code	Feature Code	2-Line Display	7-Line Display
Account Code Entry	*82	82 + code	Acct	AccountCode
Alarm*	*759		Alarm	Alarm
Auto Answer All	*754			AutoAns All
Auto Answer Intercom	*753			AutoAnsIcom

Auto Dial
  Inside (ext., group, zone)
  Outside
	
	*22 + ext. no.
	*21 + tel. no.
			AutoD...
			In
			Out
				Auto Dial
				Inside
				Outside

Automatic Line Selection
  On
  Off
	
	*14
	**14
				AutoLineSel

Barge-In*	*58†		Barge	Barge In

Callback
  Automatic
    On
    Off
  Selective
    Cancel selective
	
	*12
	**12
	*55
		
		55
		*55
			CbckA
			On
			Off
			CbckS
				Cback Auto
				On
				Off
				Cback Sel

Call Waiting
  On
  Off
  Call Waiting Pickup
	
	*11
	**11
		
		87
			CWait
			On
			Off
				CallWaiting
				On
				Off

Camp-On	*57	57	Camp	Camp On
Conference	*772	772	Conf	Conference

Coverage
  Receiver buttons
    Group
    Primary
    Secondary
  Sender buttons
    Cover inside & outside calls
    Cover outside calls only
    Coverage Off
	
	*42 + ext. no.
	*40 + ext. no.
	*41 + ext. no.
	
	*48
	**48
	*49
			Cover
			
			Group
			Prary
			Secnd
			
			CvIns, On
			CvIns, Off
			CvOff
				Coverage
				
				Group
				Primary
				Secondary
				
				CoverInside, On
				CoverInside, Off
				CoverageOff

* System operator-only feature
† Centralized telephone programming only

MLX-10D	MLX-28D	MLX-20L	Single Line	MLX-10	Analog Multiline	Feature
K P B	K P B	K P B	K P	K P B	K P B	Account Code Entry
	K P B	K P B			K P B	Alarm
					K P B	Auto Answer All
					K P B	Auto Answer Intercom
K P B	K P B	K P B		K P B	K P B	Auto Dial Inside (ext., group, zone) Outside
K P B	K P B	K P B		K P B	K P B	Automatic Line Selection On Off
K P B	K P B	K P B		K P B	K P B	Barge-In
K P B	K P B	K P B	K P	K P B	K P B	Callback Automatic On Off Selective Cancel selective
K P B	K P B	K P B	K P B	K P B	K P B	Call Waiting On Off Call Waiting Pickup
K P B	K P B	K P B		K P B	K P B	Camp-On
B	B	B		B	B	Conference
K P B	K P B	K P B	K P B	K P B	K P B	Coverage Receiver buttons Group Primary Secondary Sender buttons Cover inside & outside calls Cover outside calls only Coverage Off

Table 2-2 Continued

Feature	Prog Code	Feature Code	2-Line Display	7-Line Display
Directory			Dir	Directory
System Directory			SysDir	System Dir
Extension Directory			ExtDr	Ext Dir
Personal Directory				Personal Dir
Do Not Disturb	*47		DND	DoNotDistrb
Drop	*773	773	Drop	Drop
Extension Status				
Direct-Line Console				
Status Off	*760	760 + DSS	OpES, ESOff	OperatorES, ESOff
Status 1	*761	761 + DSS	OpES, ES1	OperatorES, ES1
Status 2	*762	762 + DSS	OpES, ES2	OperatorEs, ES2
Telephones (rooms or agents)				
Status Off		*44		
Status 1	*45	45	ES, ES1	ES Status, ES1
Status 2	*44	44	ES, ES2	ES Status, ES2
Feature button	*20			Feature Btn
Forward and Follow Me				
Activate				
Forward (Inside)	*33	33 + ext. no.	Forwd	Forward
Remote Call Forward (Outside)	*33	33 + tel no.	Forwd	Forward
Follow Me		34 + ext. no.	FlwMe	Follow Me
Cancel Forward, Remote Call				
Follow Me				
At originating station		*33 + own ext.		
At destination station				
cancel one		*34 + ext. no.		CanclFollow (QCC only)
cancel all		*34*		CanclFollow (QCC only)
Group Calling				
In-Queue Alarm button	*22 + calling group ext. no.		GrpCl	Group Call
Calling group supervisor				
Enter supervisor mode		32 + Hold		
Exit supervisor mode		32 + Drop		
Available (ES Status 2)	*762	762 + DSS	OpES, ES2	OperatorES, ES2
Unavailable (ES Status Off)	*760	760 + DSS	OpES, ESOff	OperatorES, ES Off
Calling group members				
Sign in (Available)	*44	44	ES, ES2	ES Status, ES2
Sign out (Unavailable)		*44	ES, ESOff	ES Status, ES Off
After-call work state (CMS only)	*45	45	ES, ES1	ES Status, ES1

MLX-10D	MLX-28D	MLX-20L	Single Line	MLX-10	Analog Multiline	Feature
K P B K P B	K P B K P B	K P B K P B K P B				Directory System Directory Extension Directory Personal Directory
K P B	K P B	K P B		K P B	K P B	Do Not Disturb
B	B	B		B	B	Drop
K P B	K P B K P B	K P B K P B	K P B	K P B	K P B K P B	Extension Status Direct-Line Console Status Off Status 1 Status 2 Telephones (rooms or agents) Status Off Status 1 Status 2
					K P B	Feature button
K P B	K P B	K P B	K P B	K P B	K P B	Forward and Follow Me Activate Forward (inside) Remote Call Forward (outside) Follow Me Cancel Forward, Remote Call Follow Me At originating station At destination station cancel one cancel all
K P B K P B	K P B K P B K P B	K P B K P B K P B	 K P B	K P B K P B	K P B K P B K P B	Group Calling In-Queue Alarm button Calling group supervisor Enter supervisor mode Exit supervisor mode Available (ES Status 2) Unavailable (ES Status Off) Calling group members Sign in (Available) Sign out (Unavailable) After-call work state (CMS only)

Table 2-2 Continued

Feature	Prog Code	Feature Code	2-Line Display	7-Line Display
Group Page Auto Dial button	*22 + group ext. no.		GrpPg	Group Page
Headset			Hdset	Hdset
Auto Answer	*780		Auto	Auto Answer
Hang Up†	*781			Hang Up
Mute (Headset/Handset)	*783		Mute	Mute
Status	*782		Stat	Status
Hold		771		
Hold release		**		
Intercom buttons				
Assign buttons†				
(factory-set type is Ring)				
Intercom	*16			SysAccess
Originate Only	*18			SysAcc-00
Change type of Intercom button				
Ring	***19		Voice, Place, Ring	Voice Annce, Place, Ring
Voice	*19		Voice, Place, Voice	Voice Annce, Place, Voice
Last Number Dial	*84	84	Last*	LastNumDial
Messaging				
Leave Message				
After calling	*25	25	LvMsg	Leave Msg
Without calling		53 + ext no.		
Cancel message left		*53 + ext no.		
Message LED off	*54	54		
Posted Message	*751		Post	Posted Msg
Send/Remove Message*	*38	38 + ext no.	SdMsg	Send/RavMsg
Receiving messages:			Msgs	Messages
Delete Message‡	*26	26	Dlete	Delete Msg
Next Message‡	*28	28	Next	Next Msg
Return Call‡	*27	27	Call	Return Call
Scroll‡	*29	29		
Night Service*	*39	39	Night	Night Srvc

† Centralized telephone programming only

* System operator-only feature

‡ Display telephones only. Programming and feature codes are used with analog multiline telephones only.

MLX-10D	MLX-28D	MLX-20L	Single Line	MLX-10	Analog Multiline	Feature
K P B	K P B	K P B		K P B	K P B	Group Page Auto Dial button

K P B	K P B	K P B		K P B		Headset
						  Auto Answer
						  Hang Up
						  Mute (Headset/Handset)
						  Status

B B	B B	B B	B	B B	B B	Hold Hold release

K B	K B	K B	K B	K B	K B	Intercom buttons
						  Assign buttons
						    (factory-set type is Ring)
						    Intercom
						    Originate Only
						  Change type of Intercom
						  button
						    Ring
						
						    Voice

K P B	K P B	K P B	K P	K P B	K P B	Last Number Dial

K P B	K P B	K P B	K P B	K P B	K P B	Messaging
						  Leave Message
						    After calling
						    Without calling
						    Cancel message

K P B	K P B	K P B		K P B	K P B	Message LED off
K P B	K P B	K P B		K P B	K P B	Posted Message
	K P B	K P B			K P B	Send/Remove Message
						Receiving messages:
K P B	K P B	K P B			K P B	Delete Message
K P B	K P B	K P B			K P B	Next Message
K P B	K P B	K P B			K P B	Return Call
					K P B	Scroll
	K P B	K P B			K P B	Night Service

Table 2-2 Continued

Feature	Prog Code	Feature Code	2-Line Display	7-Line Display

Notify
  Send
  Receive
	
	*757 + ext. no.
	*758 + ext. no.
			Ntfy
			Send
			Recv
				Notify
				Send
				Receive

Park	*86		Park	Park
Park Zone Auto Dial*	*22 + park zone		PrkZn	Park Zone
Personal Speed Dial	# + 01-24 + *21 + tel no. + #	01-24		
Personalized Ringing	*32 + ring (1-8)		PRing,Pat#1... Pat#8	PersonalRng, Pattern #1... Pattern#8

Pickup
  General use
  Specific extension
  Specific line
  Group
	
	*9
	*9 + ext. no.
	*9 + line no.
	*88
		
		9 + ext. no.
		9 + line no.
		88
			Pkup
			Genrl
			Ext
			Line
			Group
				Pickup
				General
				Extension
				Line
				Group

Privacy
  On
  Off
	*31	
		31
		*31
			Prvcy	Privacy

Recall	*775	775	Recll	Recall

Reminder Service
  Set
 	
  Operator Set
 	
  Cancel
  Operator Cancel
 	
  Missed
	
	*81
	
	**81
	
	*752
		
		81 + time +
		A or P
		81 + ext. no.
		+ time +
		A or P
		*81
		*81 + ext.
		no.
			Rmind
			Set
			
			Cancl
			
			Missd
				Reminder
				Set
				
				Cancel
				
				Missed

Ringing & Idle Line Preference Cancel	*343 *344		LnPrf,On LnPrf,Off	Line Prefer, On Line Prefer, Off

Ringing Options
  Individual lines
    Immediate ring
    Delayed ring
    No ring
	
	*37
	*36
	*35
			RngOp
			1Line
			Immed
			Delay
			No
				RingOptions
				One Line
				Immed Ring
				Delay Ring
				No Ring

Continued

* System operator-only feature

MLX-10D	MLX-28D	MLX-20L	Single Line	MLX-10	Analog Multiline	Feature
K P B	K P B	K P B		K P B	K P B	Notify Send Receive
K P B	K P B	K P B	K P	K P B	K P B	Park
	K P B	K P B			K P B	Park Zone Auto Dial
K P B			K P	K P B	K P B	Personal Speed Dial
K P B	K P B	K P B		K P B	K P B	Personalized Ringing
K P B	K P B	K P B	K P	K P B	K P B	Pickup General use Specific extension Specific line Group
K P B	K P B	K P B	K P	K P B	K P B	Privacy On Off
K P B	K P B	K P B		K P B	K P B (fixed button)	Recall
K P B	K P B	K P B	K P B	K P B	K P B	Reminder Service Set Operator Set Cancel Operator Cancel Missed
K P B	K P B	K P B		K P B	K P B	Ringing & Idle Line Preference Cancel
K P B	K P B	K P B		K P B	K P B	Ringing Options Individual lines Immediate ring Delayed ring No ring

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Table 2-2 Continucd

Feature	Prog Code	Feature Code	2-Line Display	7-Line Display
Ringing Options, *Continued*				
All lines			AllLn	All Lines
Immediate ring	*347		Imed	Imed Ring
Delayed ring	*346		Delay	Delay Ring
No ring	*345		No	No Ring
Abbreviated ring			Abbrv	Abbreviated
On	*341		On	On
Off	*342		Off	Off
Send ring			ShRng	SharedSARng
On	*15		On	On
Off	**15		Off	Off
Saved Number Dial	*85		Save*	SaveNumDial
Send/Remove Message*	*38	38 + ext. no.	SdMsg	Send/RmvMsg
Signaling (manual)	*23 + ext. no.		Signl	Signal
System Access buttons				
Assign buttons†				
(factory-set type is Ring)				
System Access	*16			SysAccess
Originate Only	*18			SysAcc-00
Shared System Access	*17 + primary ext. no			ShareSysAcc
Change type of System Access or Shared System Access button				
Ring	**19		Voice, Place, Ring	Voice Annce, Place, Ring
Voice	*19		Voice, Place, Voice	Voice Annce, Place, Voice
System Speed Dial	*24 + code	600-729	SpdDl	SysSpeedDl
Transfer	*774	774	Trans	Transfer
Voice Announce			Voice Recv	Voice Annce Receive
On	*10		On	On
Off	**10		Off	Off

* System operator-only feature

† Centralized telephone programming only

MLX-10D	MLX-28D	MLX-20L	Single Line	MLX-10	Analog Multiline	Feature

K P B	K P B	K P B		K P B	K P B	Ringing Options, *Continued*
						 All lines
						  Immediate ring
						  Delayed ring
						  No ring

K P B	K P B	K P B		K P B	K P B	Abbreviated Ring
						  On
						  Off

P	P	P	P	P	P	Send ring
						  On
						  Off

K P B	K P B	K P B		K P B	K P B	Saved Number Dial
	K P B	K P B			K P B	Send/Remove Message
K P B	K P B	K P B		K P B	K P B	Signaling (manual)

P	P	P	P	P	P	System Access buttons
						  Assign buttons
						  (factory-set type is Ring)
						    System Access
						    Originate Only
						    Shared System Access
						
						  Change type of System
						  Access or Shared System
						  Access button
						    Ring
						
						    Voice

K P B	K P B	K P B	K P	K P B	K P B	System Speed Dial
B	B	B		B	B	Transfer

K P B	K P B	K P B		K P B	K P B	Voice Announce
						
						  On
						  Off

Account Code Entry

Extension Programming

```
Programming Code:        *82
Feature Code:             82 + code
MLX Display Label:       AccoutCode [Acct]
```

Description

See "Station Message Detail Recording" in this ohapter for details on when and how calls are included SMDR report.

Account Code Entry is used to enter account codes for outside calls (incoming or outgoing). The account codes appear on Station Message Detail Recording (SMDR) reports with other call information. They are used for billing or cost accounting to associate outgoing calls with a project, client, or department.

Users can enter account codes before a call, during a call, or not at all. They can also change, cancel, or correct an account code while a call is in progress.

To enter an account code before making an outside call, the user activates Account Code Entry, enters the account code, and completes the entry. The user then selects an outside line and proceeds with the call.

To enter, change, correct, or cancel an account code during a call, the user activates the feature, enters the account code, and completes the entry. The caller cannot hear the tones.

To cancel an account code previously entered, the user activates Account Code Entry and completes the entry without entering an account code.

Telephone Differences

Queued Call Console

On QCCS, Account Code Entry is activated by selecting the feature from the Home screen or by pressing the Feature button and selecting the feature from the display. After the account code is dialed, the entry is completed by dialing a #.

All Other Multiline Telephones

On all other multiline telephones, Account Code Entry is activated by pressing a programmed Account Code button or by pressing the Feature button and dialing 82. After the account code is dialed, the entry is completed by pressing a programmed Account Code Entry button or dialing #. On MLX display telephones, the feature can also be activated and completed by pressing the Feature button and selecting the feature from the display.

Note: If the multiline telephone user completes the entry by dialing a #, account codes cannot be entered with System Speed Dial or Personal Speed Dial. The # completes the entry and cannot also be used to activate Speed Dial.

Single-Line Telephones   On single-line telephones, Account Code Entry is activated during a call by putting the caller on hold, getting an internal dial tone, and dialing #82. (Dialing #82 is also necessary to activate the feature before a call.) The entry is completed by dialing #.

Single-line telephones must have touch-tone dialing to activate the feature. They must be programmed through idle Line Preference to select a System Access or Intercom button when the user lifts the handset.

Single-line telephone users cannot enter account codes with System Speed Dial or Personal Speed Dial because these features are activated by dialing #. The # completes the entry of an account code and cannot also be used to activate the Speed Dial features.

Considerations

- Account codes cannot be entered for incoming calls received on an individual Cover or Group Cover button. Account codes must be entered at the sender's telephone for coverage calls.

- A programmed Account Code button only activates and completes the account code entry. If the user also wants to enter account codes by using a button, a separate Auto Dial button must be programmed.

- Users cannot change an account code entered from another telephone.

- Account codes can be entered, changed, corrected, or canceled during a call.

- The caller cannot hear account codes entered during a call.

- Only the digits 0-9 are allowed for account codes. Other special characters are not allowed, and the account code must consist of 1-16 characters. Extra characters (more than 16) are ignored by the system.

- The system does not validate account codes; it only checks for completion of Account Code Entry (via dialing #, pressing an Account Code Entry button, or selecting Account Code Entry from the display).

Feature Interactions

Auto Dial   Frequently used account code numbers can be programmed onto outside Auto Dial buttons.

Automatic Line Selection   Account codes can be entered by a single-line telephone user only when the Automatic Line Selection is programmed to select a System Access or intercom button when the user lifts the handset.

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Automatic Route Selection	When ARS is used on the system, an account code can be entered before or after dialing the telephone number. If Forced Account Code Entry is assigned, the user must enter the oode before dialing the ARS dial-out code.
Callback	An account code must be entered before the user activates Callback. If not, the user must wait until after the call is connected before entering the account code. Account codes cannot be entered while the call is queued.
Conference	A separate account code must be entered for each outside call added to a conference.
Coverage	When answering calls on a Primary Cover, Secondary Cover, or Group Cover button, a receiver cannot enter an account code. The account code must be entered from the sender's telephone. (If the receiver tries to enter an account code, no error tone sounds and the account code does not appear on the SMDR printout.) Since Cover buttons are not required when the QCC queue is programmed as a receiver for a Coverage group, a QCC system operator can enter account codes and the account code appears on the SMDR printout.
Directory	An MLX-20L telephone user can program account codes either individually or with a telephone number in a Personal Directory listing. However, the user must lift the handset or press the Speakerphone button before selecting the listing from the display.
Display	When the Account Code Entry feature is activated, the "Acct:" message on the display prompts the user to enter the account code. The account code digits are shown next to the prompt as they are dialed.
Queued Call Console	On a QCC, Account Code Entry can be activated only by selecting the feature from the display-not by feature codes. Normally, account codes cannot be entered when a Group Coverage call is answered at a Group Cover button programmed on a multiline telephone. However, when the QCC queue is programmed as the receiver for a coverage group, the QCC system operator can enter account codes and the account code appears on the SMDR printout. Cover buttons are not required when the QCC queue is programmed as a receiver for a coverage group.
Remote Access	Account codes cannot be entered on calls made via Remote Access.

Speed Dial

Multiline telephone users who use a programmed Account Code button or display telephone users who select the feature from the display can use Personal Speed Dial and System Speed Dial to dial account codes. Single-line telephone users and multiline telephone users who complete the entry by dialing a # cannot use Personal Speed Dial or System Speed Dial to dial account codes since the # required to *use* Speed Dial also completes Account Code Entry.

Station Message Detail Recording

The account code is printed in the "Account" field of the SMDR record.

Hardware Requirements

An RS-232 compatible, 80-column serial printer or other device is needed to print SMDR/Account Code reports.

Related Features

■ Forced Account Code Entry

■ Station Message Detail Recording

Alarm

| Extension Programming | Programing Code: *759
MLX Display Label: Alarm [Alarm] |

Description

Two alarms are available to provide either a visible or audible indication when the system detects a problem that can degrade service and, therefore, requires immediate attention:

- **Alarm button.** A programmed button on direct-line-consoles (DLCs) and queued call consoles (QCCs), that alerts the system operator to problems detected by the system software. The red LED next to the Alarm button on the system operator console goes on when the system detects a problem that requires immediate attention. The red LED remains on until the problem is corrected.

- **Maintenance Alarm alert.** An alert device (such as a bell or strobe) connected to a line/trunk jack designated through system programming as a Maintenance Alarm port. The device rings or lights when the system detects a problem that requires immediate attention.

Note: An alarm should be reported immediately to the system manager.

Telephone Differences

An Alarm button is used only on system operator consoles and cannot be programmed on any other telephone.

An Alarm button is assigned as a fixed feature on a QCC.

A digital DLC system operator or a QCC system operator can use Inspect to display the number of alarms; an analog DLC system operator cannot use the Inspect feature.

Considerations

- The Alarm can be activated only at a programmed button; feature codes cannot be used for Alarm.

- The red LED next to the alarm goes on and/or the Maintenance Alarm sounds or flashes as soon as the system detects a problem.

- All system operator consoles with an Alarm button receive the indication.

Feature Interactions

Automatic Maintenance Busy   The red LED goes on next to the Alarm buttons on system operator consoles, and the designated Maintenance Alarm alert device sounds or flashes when more than 50 percent of the trunks in the trunk pool are in a maintenance-busy state.

Direct-Line Console   The DLC system operator uses an Alarm button to monitor system operation. A system operator with a digital DLC can use Inspect to display the number of alarms: a system operator with an analog DLC cannot use Inspect.

On a small system (fewer than 29 lines), an Alarm button is factory-assigned to analog DLCs with 34 buttons or more. On a large system (more than 29 lines), the Alarm button is replaced with line 30. An Alarm button is factory-assigned to an MLX-28D used as a DLC, regardless of the number of lines/trunks connected to the system. The Alarm button is not a fixed feature and can be assigned to any available button on an analog or digital DLC.

Inspect   Inspect can be used on a digital DLC or a QCC to display the number of alarms; Inspect cannot be used on an analog DLC.

Personal Lines   A line/trunk jack used for a Maintenance Alarm cannot be assigned as a personal line.

Pools   A trunk jack used for a Maintenance Alarm cannot be assigned to a trunk pool (Hybrid/PBX only).

Queued Call Console   An Alarm button is assigned as a fixed feature on a QCC.

System Programming

■ Designate line/trunk jack that connects an external alerting device used for Alarm.

```
AuxEquip -> MaintAlarms
```

Allowed Lists

Description

See "Calling Restrictions" in this chapter for information on types of restrictions.

Assigned to individual telephones via system programming, an Allowed List is a list of telephone numbers that a user with an outward- or toll-restricted telephone can dial.

For example, an Allowed List assigned to an outward-restricted telephone can permit calls to specific local or toll numbers, such as emergency numbers (911). For toll-restricted telephones, an assigned Allowed List can allow calls to specific area codes and/or exchanges needed for daily tasks.

Considerations

■ A maximum of eight lists can be programmed, and each list can contain a maximum of ten numbers.

■ More than one Allowed List can be assigned to each telephone up to the maximum of eight.

■ Individual Allowed Lists are numbered 0 through 7, and within each list, entries are numbered 0 through 9.

■ Each number in a list can have a maximum of six digits (for example, an area code followed by an exchange) plus a leading 1 if a toll prefix is required.

■ Special characters, such as Pause, cannot be used in Allowed list entries.

Feature Interactions

Auto Dial

A user with an outward-restricted telephone cannot dial an outside number by using an Auto Dial button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using an Auto Dial button unless the number is included on an Allowed List assigned to the telephone.

Automatic Route Selection

ARS checks calling restrictions before choosing the route for a call. This prevents users with restricted telephones from dialing numbers that are not included on an Allowed list.

Calling Restrictions

When used with calling restrictions, Allowed Lists can permit the dialing of specific numbers such as emergency numbers from an outward- or toll-restricted telephone.

Conference   A user with an outward-restricted telephone cannot add an outside participant to a conference call unless the participant's number is on an Allowed list assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number to add a participant unless the participant's number is on an Allowed List assigned to the telephone.

However, if a conference-call originator with an outside call presses the Conference button, selects an outside line, and presses Conference again before dialing a number, the outside person can dial a toll call, thereby overriding calling restrictions assigned to the conference originator's telephone. The toll call is billed to the originator's company.

Directory   When a marked System Directory listing includes a toll telephone number in addition to an access code, using the System Directory to dial the number overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.

A user with an outward-restricted telephone cannot dial an outside number by using a Personal Directory or System Directory listing (excluding a marked System Directory listing) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using a Personal Directory or System Directory listing (excluding a marked System Speed dial code) unless the number is on an Allowed List assigned to the telephone.

Disallowed Lists   Disallowed Lists take precedence over Allowed Lists. If a telephone number is on both an Allowed List and a Disallowed List and both are assigned to an individual telephone, the user cannot dial the number.

Forward and Follow Me   A user with an outward restricted telephone cannot forward calls to an outside number unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number unless the number is on an Allowed List assigned to the telephone. When activating Forward, the user with a restricted telephone does not hear an error tone, but when a call is received, the forward is denied if the number is not on the Allowed List.

Personal Lines   A user with an outward-restricted telephone cannot dial an outside number on a Personal Line button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number on a Personal Line button unless the number is on an Allowed List assigned to the telephone.

Remote Access   An Allowed List is one of the class-of-restriction (COR) items for Remote Access. When barrier codes are not used, Allowed Lists are assigned to lines/trunks system wide. When barrier codes are used, Allowed Lists are assigned to individual barrier codes.

Speed Dial

When a marked System Speed Dial number (the dialed number is suppressed from the display) is used to dial a number that includes a toll telephone number in addtion to an access number, using the System Speed Dial code to dial the number overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.

A user with an outward-restricted telephone cannot use Personal Speed Dial or System Speed Dial to dial an outside number that is not marked (the dialed number is not suppressed from the display) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using Personal Speed Dial or System Speed Dial (when the display of the number dialed is not suppressed) unless the number is on an Allowed List assigned to the telephone.

System Access

In the Hybrid/PBX mode, a user with an outward-restricted telephone cannot dial an outside number on a System Access button (including Shared System Access buttons) unless the number is on an Allowed List assigned to the telephone being used to make the call. A user with a toll-restricted telephone cannot dial a toll number on a System Access button (including Shared System Access buttons) unless the number is on an Allowed List assigned to the telephone being used to make the call.

System Programming

■ Establish, change, or remove Allowed List entries.

Tables -> AllowList

■ Assign or remove Allowed Lists from individual telephones.

Tables -> AllowTo

■ In addtion, when Remote Access is used:

■ Assign or remove Allowed Lists from non-tie lines/trunks used for Remote Access.

LinesTrunks -> RemoteAccss -> Non-TIE -> Allow List

■ Assign or remove Allowed Lists from tie trunks used for Remote Access.

LinesTrunks -> RemoteAccss -> TIE Lines -> Allow List

■ Assign or remove Allowed Lists from each Remote Access barrier code.

LinesTrunks -> RemoteAccss -> BarrierCode -> Allow Lists

Related Features

■ Calling Restrictions
■ Disallowed Lists

■■■■■■■■■■■■■■■■■■■■■■■■■

Auto Answer All

Extension Programming	Programming Code: *754 MLX Display Label: AutoAnsAll (centralized telephone programming only)

Description

See Chapter 5 for more information about adjuncts and GPAs.

Auto Answer All is used on analog multiline telephones or analog direct-line consoles (DLCs) with an optional modem, answering machine, fax, or other answering device connected via a General Purpose Adapter (GPA). With Auto Answer All, the device can automatically answer both outside and inside voice and data calls when the user is not available.

Auto Answer All is also used with a 502B or 502C headset adapter to allow the analog multiline telephone or DLC user with a headset to be connected automatically to ringing calls. A tone heard through the headset signals an incoming call.

A programmed button is used to activate and deactivate Auto Answer All. The user selects the lines to be answered by the device by programming Immediate Ring or Delayed Ring as the ringing option. Lines that are not to be answered are programmed as No Ring. See "Ringing Options" in this chapter.

To activate Auto Answer All, the user slides the switch on the GPA to Auto and presses the Auto Answer All button. The green LED next to the button turns on, and incoming calls are answered automatically.

If the user wants the answering device to answer only inside calls, all personal lines (outside lines assigned to buttons on the telephone) must be programmed for No Ring. See "Ringing Options" in this chapter.

To deactivate the feature, the user can either slide the switch on the GPA to Basic or press the Auto Answer All button. If the button is pressed to deactivate the feature, the green LED next to the button goes off. In either case, the telephone returns to normal operation.

Telephone Differences

Auto Answer All cannot be programmed on an MLC-5 cordless telephone, MLX telephone, or single-line telephone.

Considerations

■ When Auto Answer All is used, all voice announcements (including Voice Announce to Busy) should be disabled because the device connected to the GPA cannot answer voice-announced calls.

■ Feature codes cannot be used to activate or deactivate Auto Answer All.

■ Only analog multiline telephones and analog DLCs can use or be programmed for Auto Answer All.

■ Both Auto Answer All and Auto Answer Intercom can be programmed on an analog multiline telephone, but they cannot be used at the same time.

■ Auto Answer All should be used instead of Auto Answer Intercom to allow an answering device to answer intercom calls. Using Auto Answer Intercom can cause intercom calls to be dropped.

■ Auto Answer All cannot be used with an optional Hands Free Unit (HFU).

■ Occasionally a second alert (or zip) tone may sound on incoming or intercom calls. This is normal.

Feature Interactions

Auto Answer Intercom   Both Auto Answer All and Auto Answer Intercom can be programmed on the same telephone, but they cannot be used at the same time.

Coverage   Auto Answer All is used when a receiver with an analog multiline telephone wants Individual or Group Coverage calls answered by an answering machine connected to the telephone.

Forward and Follow Me   An answering device connected to an analog multiline telephone can answer forwarded calls when Auto Answer All is activated.

Group Calling   Members in a calling group with analog multiline telephones can use Auto Answer All when an answering machine is connected to their telephones. When the feature is activated, all incoming calls ringing on the calling group member's telephone, both calls for the calling group and calls to the member's own extension, are answered automatically by the answering machine.

Queued Call Console   Auto Answer All cannot be programmed on a QCC.

Ringing Options   The analog multiline telephone user selects the lines to be answered by the device connected on a GPA by programming each line to be answered for Immediate or Delayed Ring and programming the lines not to be answered for No Ring. If the user wants the device to answer only inside calls, all personal lines (outside lines assigned to buttons on the telephone) must be programmed for No Ring.

System Access

When Auto Answer All is activated, all calls received at an Intercom or System Access Ring, or Intercom or System Access Voice button can be answered automatically by the device connected to the GPA. If Shared System Access buttons are assigned, only the principal station should be programmed for immediate Ring to prevent the call from being answered at the principal station and at stations with the Shared System Access button.

Voice-announced calls received at the analog multiline telephone are not answered by a device connected via a GPA since ringing current is not sent to the device.

Hardware Requirements

A GPA is needed to connect an answering device to an analog multiline telephone.

Related Features

■ Auto Answer Intercom

Auto Answer Intercom

Extension Programming

> **Programming Code: *753**
> **MLX Display Label: AutoAnsIcom (centralized**
> **telephone programming only)**

Description

See Chapter 5 for more on the HFU.

Some models of analog multiline telephones do not have a built-in speakerphone. Users with this type of telephone can still answer inside calls without lifting the handset by using Hands Free Answer on Intercom (HFAI). By connecting an optional Hands-Free Unit (HFU), a user can also answer outside calls without lifting the handset.

The Auto Answer Intercom feature expands the capabilities of the HFU to include inside calls received on an Intercom or System Access button. With Auto Answer Intercom, the HFU can be used to answer both inside and outside calls without lifting the handset.

To activate Auto Answer Intercom, the user presses the Auto Answer Intercom button. The green LED next to the button turns on, and the HFU turns on automatically when an inside or outside call is received.

To deactivate the feature, the user presses the Auto Answer Intercom button. The green LED next to the button turns off, and the HFU turns on automatically only when outside calls are received.

Telephone Differences

Auto Answer Intercom cannot be used on an MLC-5 cordless telephone, MLX telephone, or single-line telephone.

Considerations

- Feature codes cannot be used to activate or deactivate Auto Answer Intercom.

- Only analog multiline telephones without a built-in speakerphone can use Auto Answer Intercom.

- Both Auto Answer Intercom and Auto Answer All can be programmed on an analog multiline telephone, but they cannot be used at the same time.

- Auto Answer All should be used instead of Auto Answer Intercom to allow an answering device to answer intercom calls. Using Auto Answer Intercom can cause intercom calls to be dropped.

- In the Hybrid/PBX mode, when Auto Answer Intercom is activated and a call is received on a System Access button, the HFU turns on even if the button is programmed for Delayed Ring or No Ring.

Feature Interactions

Auto Answer All   Both Auto Answer All and Auto Answer Intercom can be programmed on the same telephone, but they cannot be used at the same time.

Coverage   Auto Answer Intercom does not allow a receiver with an analog multiline telephone to use an HFU to answer calls received on a Primary Cover, Secondary Cover, or Group Cover button.

Queued Call Console   Auto Answer Intercom cannot be programmed on a QCC.

System Access   When the Auto Answer Intercom feature is activated, the HFU is used to answer inside and outside calls received on a System Access button. This excludes calls received on a Shared System Access button.

Hardware Requirements

Auto Answer Intercom is used only by analog telephones with an HFU connected.

Related Features

■ Auto Answer All

Auto Dial

Extension Programming
Inside Auto Dial:
Programing Code: *22 + extension number
MLX Display Label: Auto Dial, Inside [AutoD,In]

Outside Auto Dial:
Programming Code: *21 + number (including special characters)
MLX Display Label: Auto dial outside, [AutoD,Out]

Description

Auto Dial buttons are used for one-touch dialing of frequently called numbers.
Two types of Auto Dial buttons can be programmed:

■ **Inside Auto Dial** button is used for any station or group extension in the dial
plan (such as co-workers, calling group, or fax machines), a paging group
extension, or a calling group extension. A system operator can also program
an inside Auto Dial button for the extension number for a park zone.

■ **Outside Auto Dial** button is used not only for frequently called telephone
numbers but also for numbers such as account codes, long-distance
company access codes, bank access codes, or emergency contact
numbers. A maximum of 28 digits can be programmed, which allows
customers using AT&T International Service or a different vendor for regular
toll service to program all required codes on an Auto Dial button.

When an inside Auto Dial button is programmed, the user can see the status of
the extension associated with the button: the green LED next to the button is on
when a person at the extension is on a call or using Do Not Disturb.

In the Hybrid/PBX mode, to make an inside or outside call by using an Auto Dial
button, the user presses the Auto Dial button without lifting the handset. A
System Access button is selected automatically (if the user has a
speakerphone, it goes on automatically) and the programmed number is dialed.

In the Key and Behind Switch modes, to make a ringing inside call or an outside
call by using an Auto Dial button, the user presses the Auto Dial button without
lifting the handset. An Intercom Ring button is selected when an inside Auto Dial
button is pressed, and a Personal Line Access button is selected automatically
when an outside Auto Dial button is pressed. if the user has a speakerphone, it
goes on automatically, and the programmed number is dialed. To make a voice-
announced inside call by using an inside Auto Dial button, the user preselects
an Intercom Voice button and presses the inside Auto Dial button without lifting
the handset. If the user has a speakerphone, it goes on automatically, and the
programmed extension is dialed.

Note: Emergency numbers and other numbers should be tested during off-peak
hours, such as early morning or late evening. The user should remain on the line
and briefly explain to the dispatcher the reason for the call.

Telephone Differences

Queued Call Console   Auto Dial buttons cannot be programmed on a queued call console (QCC). The Personal or System Directory can be used instead of outside Auto Dial buttons. The Extension Directory or DSS buttons can be used instead of inside Auto Dial buttons.

All Other Multiline Telephones   All multiline telephone users can program and use Auto Dial buttons. Personal Directoty can be used in place of Auto Dial on MLX-20L telephones.

Single-Line Telephones   Single-line telephone users cannot program Auto Dial buttons.

Mode Differences

Hybrid/PBX   In the Hybrid/PBX mode, the system automatically selects a System Access button when the user presses an inside or outside Auto Dial button before lifting the handset.

To allow time to receive a local telephone company dial tone, one or two Pause characters must be programmed immediately following a pool dial-out code or an acoess code for a long-distance carrier. Pause characters are entered by pressing the Hold button.

Key   In the Key mode, the system automatically selects an outside line button when the user presses an outside Auto Dial button without lifting the handset. When the user presses an inside Auto Dial button without lifting the handset, the system automatically selects an Intercom button.

Behind Switch   In the Behind Switch mode, the user must press a Prime Line or outside line button before pressing an outside Auto Dial button and must press an Intercom button before pressing an inside Auto Dial button. The system does not automatically select an outside line.

To allow time to receive a local telephone company dial tone, one or two Pause characters must be programmed immediately following a pool dial-out code when required by the host system or an access code for a long-distance carrier. Pause characters are entered by pressing the Hold button.

Considerations

- ■ Auto Dial can be used only with a programmed button. MLX display telephone users can select the feature from the display only while programming the feature.

- ■ A maximum of 28 digits can be programmed on reside or outside Auto Dial buttons.

- ■ When an inside or outside Auto Dial button is used to make a call, the green LED next to the button does not go on.

- ■ When an inside Auto Dial button is programmed, the user can see the status of the extension associated with the button; when the person ison the telephone or using Do Not Disturb the green LED next to the button is on. However, if an extension is busy because features are being assigned through system or centralized telephone programming, the green LED next to the button is not on.

- ■ Only company extension numbers should be programmed on inside Auto Dial buttons. Account codes, access codes, and outside telephone numbers should be programmed on outside Auto Dial buttons.

- ■ If the user tries to program an incomplete extension number on an inside Auto Dial button, the system does not provide an error tone and the button remains as previously programmed.

- ■ On Hybrid/PBX systems, the number programmed on an outside Auto Dial button must include the pool dial or Automatic Route selection (ARS) code and two Pauses before the telephone number to allow time to receive dial tone from the local telephone company.

- ■ If numbers are being dialed incorrectly by outside Auto Dial, it is possible that the digits are being dialed before a central office dial tone is received. In this case, a Pause should be programmed as the first digit of the dialed number in the Key mode and as the second digit (after the dial-out code) of the dialed number in the Hybrid/PBX mode.

For information on special characters and their meanings, see Appendix D.

- ■ Special characters may be needed when programming outside Auto Dial buttons. Each of these characters counts as one of the 28 digits allowed.

Feature Interactions

Account Code Entry

Frequently used account code numbers can be programmed onto outside Auto Dial buttons.

**Allowed Lists
Calling Restrictions**

A user with an outward-restricted telephone cannot dial an outside number by using an Auto Dial button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using an Auto Dial button unless the number is on an Allowed List assigned to the telephone.

Automatic Route Selection   ARS dial-out codes cannot be programmed on inside Auto Dial buttons. An ARS dial-out code can be programmed on an outside Auto Dial button when a telephone number is also included.

Conference   The Conference button is pressed to enter the Flash special character in a telephone number programmed on an Auto Dial button. The Drop button is pressed to enter the Stop special character in a telephone number programmed on an Auto Dial button.

Direct-Line Console   Inside Auto Dial can be assigned to an available button on a DLC. The system operator can use the buttons to transfer a call, make an internal call, or determine availability of the extension.

Disallowed Lists   A user cannot dial an outside number by using an Auto Dial button when the number is on a Disallowed List assigned to the telephone.

Display   When a user presses a programmed Auto Dial button, the digits appear on the display as if the user were dialing them from the dialpad, and the number is automatically dialed. An MLX telephone user can select Auto Dial from the display only during programming.

If the Stop character is the last character in the dialed number, it is not displayed when the user presses the Auto Dial button. The user must press the Auto Dial button again to complete dialing.

Do Not Disturb   When a user activates Do Not Disturb, the green LED goes on next to all Auto Dial buttons programmed with the user's extension.

Forced Account Code Entry   Frequently used account code numbers can be programmed onto outside Auto Dial buttons.

Group Calling   The Calls-in-Queue-Alarm button for a calling group is assigned on a multiline telephone by programming an inside Auto Dial button with the calling group's extension number.

When a DSS is not available, Auto Dial buttons programmed with each calling group member's extension are used by the calling group supervisor to monitor group member availability.

Headset Options   If headset operation is activated on the telephone or console, the user must select a line button before using Auto Dial to dial an extension or an outside number.

Last Number Dial	A number dialed by pressing a programmed outside Auto Dial button is saved for Last Number Dial as if it were dialed with the dialpad, but special characters do not work. An extension dialed by pressing a programmed inside Auto Dial button is not saved for Last Number Dial.
Microphone Disable	When an MLX telephone user's microphone is disabled, pressing an Auto Dial button turns on the speakerphone so the user can hear the number being dialed. However, the user must lift the handset to talk once the call is answered.
Paging	An extension for a speakerphone paging group can be programmed on an inside Auto Dial button.
Park	A system operator can program the park zone codes on inside Auto Dial buttons. An inside Auto Dial button can also be programmed with a user's (including system operator's) own extension number and can be used to park calls. When the system is programmed for One-Touch Hold with manual completion, a user hears a busy signal when parking a call at his or her own extension number and must complete the transfer by hanging up or pressing the Transfer button.
Personal Lines	Only an outside Auto Dial button can be used on a personal line-an inside Auto Dial button cannot be used on a personal line.
Pools	Pool dial-out codes cannot be programmed on inside Auto Dial buttons. A pool dial-out code can be programmed on an outside Auto Dial button when a telephone number is also included: however, one or two Pause characters must be programmed before the telephone number to allow time to receive local telephone company dial tone. Pause characters are entered by pressing the Hold button.
Queued Call Console	An Auto Dial button cannot be programmed on a QCC.
Saved Number Dial	A number dialed by pressing a programmed outside Auto Dial button is saved for Saved Number Dial as if it were dialed with the dialpad, but special characters do not work. An extension dialed by pressing a programmed inside Auto Dial button is not saved for Saved Number Dial.
Signaling	A Signaling button and an Auto Dial button cannot be programmed for the same extension. If a user tries to program an Auto Dial button when a Signaling button is already programmed, or vice versa, the feature being programmed erases the previously programmed feature.
Station Message Detail Recording	All numbers dialed on an outside call by using Auto Dial are recorded on the SMDR report.

System Access   When an inside Auto Dial button is pressed, the system automatically selects an
Intercom or System Access button and turns on the speakerphone. When
outside Auto Dial button is pressed, the system automatically selects an outside
line button in the Key mode, a Prime Line button in the Behind Switch mode, or a
System Access button in the Hybrid/PBX mode.

Transfer   Users can press Auto Dial buttons instead of dialing extension numbers to
transfer calls. To use the One-Touch Transfer option, users must program an
Auto Dial button for every extension to Which they transfer calls. When a system
operator transfers a call and it returns unanswered, the green LED next to the
Auto Dial button flashes to indicate the extension from which the call is
returning. Only system operators receive this indication.

Related Features

■ Directory System Speed Dial

■ Personal Speed Dial

Automatic Line Selection

Extension Programming

> **Programming Code:**
> **Begin selection: *14**
> **End selection **14**
> **MLX Display Label (centralized telephone programming only):**
> **Begin selection: AutoLineSel**
> **End selection: Enter**

Description

Automatic Line selection is the programmed order in which the system makes outside lines available to a user. A preferred Automatic Line Selection sequence can be programmed for one to eight lines assigned to individual telephones. When the user lifts the handset or presses the Speaker button (without manually selecting a line), the system automatically connects the user to the first line in the preferred sequence. If the first line in the programmed Automatic Line Selection sequence is busy, the system connects the user to the second-choice line, and so forth.

For example, if a user normaly makes toll calls, a WATS line assigned to the station can be programmed as the first line in the sequence and local lines as the second, third, etc. When the user lifts the handset or presses the Speaker button, the WATS line, if available, is automatically selected.

To override Automatic Line Selection when another line is preferred, the multiline user presses another line button (preselects the line manually) before lifting the handset or pressing the Speaker button.

Telephone Differences

Queued Call Console

Automatic Line selection on a QCC is a fixed sequence that starts at the lower Call button and moves upward.

All Other Multiline Telephones

On all other multiline telephones, the Automatic Line Selection is assigned by using programming codes or on MLX display telephones by selecting the feature from the display. Feature codes cannot be used.

When the programming code for Automatic Line Selection is entered, the system clears the current Automatic Line Selection sequence and the green LED for each line button goes off. As the user presses each line button to be added to the sequence, the green LED flashes to indicate the line is successfully added to the sequence.

Single-Line Telephones   The Automatic Line Selection sequence for single-line telephones can be changed only via centralized telephone programming and cannot be changed by the telephone user.

The Automatic Line Selection sequence for single-line telephones and other tip/ring equipment connected to a 012 module or a Multi-Function Module (MFM) is factory set to include only the Intercom Ring or System Access Ring button..

In the Key mode, the preferred sequence can be changed via centralized telephone programming to include outside lines assigned to the telephone. This allows the single-line telephone user to select outside lines assigned to the telephone by dialing the idle line Preference access code (normally a 9). The Automatic Line Selection sequence can be changed to include only outside lines and not an intercom button; however, with this arrangement, the single-line telephone user cannot use system features.

In the Behind Switch mode, the factory setting for Automatic Line Selection is the Prime Line. The factory setting can be changed via centralized telephone programming to an Intercom line followed by the Prime Line or outside lines. This allows the single-line telephone in the Behind Switch mode to use system features and to select the Prime Line and/or outside lines by dialing the idle Line Preference access code (usually a 9).

Mode Differences

Hybrid/PBX   In the Hybrid/PBX mode, Automatic Line Selection is needed only when Personal Line or Pool buttons are assigned to multiline telephones, or when single-line telephones or other tip/ring devices (such as fax) are connected to a 012 module or MFM.

Key   In the Key mode, outside lines assigned to buttons on the telephone are programmed in the Automatic Line Selection sequence for multiline telephones.

Behind Switch   In the Behind Switch mode, Automatic Line Selection is needed to allow single-line telephone users to make inside calls and use system features. See above for single-line telephone differences.

Considerations

- No more than eight lines can be programmed in an Automatic Line Selection sequence.
- Outside lines/trunks, tie trunks, System Access lines, or Intercom lines can be included in the sequence, but the four types of lines/trunks should not be mixed.

■ When outside lines/trunks or pools are assigned to a single-line telephone, they are automatically added to the Idle Line Preference sequence.

■ To ensure that the correct sequence is selected, Automatic Line Selection should be programmed first if the user is programming additional features in one session.

Feature Interactions

Account Code Entry, Forced Account Code Entry	Account codes can be entered by a single-line telephone user only when the Automatic Line Selection is programmed to select a System Access or Intercom button when the user lifts the handset.
Coverage	Primary Cover, Secondary Cover, and Group Cover buttons cannot be programmed in an Automatic Line Selection sequence since the buttons cannot be used to make calls.
Headset Options	Automatic Line Selection does not apply when an MLX telephone or console is in headset operation. A headset user must select a line manually before making a call.
Multi-Function Module	When an MFM is installed in an MLX telephone, the Automatic Line Selection order for the MFM should be set to select Intercom or System Access Ring, then Intercom or System Access Originate Only, and then outside lines (or the Prime Line in Behind Switch mode) assigned to the MFM.
Queued Call Console	Automatic Line Selection on a QCC is a fixed sequence that starts at the lower Call button and moves upward.
Ringing/Idle Line Preference	Ringing/Idle Line Preference must be activated to allow the system to automatically select the lines programmed in the Automatic Line Selection sequence. In the Key and Behind Switch modes, an available outside line or Prime Line (Behind Switch mode only) is selected by dialing the Idle Line Preference access code (usually a 9) on an Intercom button.
System Access	Intercom or System Access (including Shared System Access) buttons can be programmed as part of an Automatic Line Selection sequence. Different button types-personal Line, Pool, Intercom, System Access, or Shared System Access buttons-should not be mixed in an Automatic Line Selection sequence.
Transfer	Automatic Line Selection does not apply when the Transfer button is pressed.

Automatic Maintenance Busy

Description

When Automatic Maintenance Busy is enabled, a malfunctioning loop-start line/trunk, ground-start line/trunk or tie trunk is automatically put in a maintenance-busy state, preventing outside calls from being made on that line/trunk (incoming calls are never blocked).

In general, there are two reasons an outside facility is put in a maintenance-busy state:

■ Faulty or delayed signaling between the system and the central office. To avoid busying out lines/trunks because of slow telephone company central office responses rather than faulty lines/trunks, four consecutive occurrences of faulty or delayed signaling are required before the line/trunk is put in the maintenance-busy state.

■ Central office failure to disconnect (make the line/trunk available for use) after the user has hung up. The line/trunk is put in the maintenance-busy state after two occurrences of a failure to disconnect.

When a line/trunk is put in the maintenance-busy state, an error is recorded on the internal error log. The log indicates which type of error occurred-faulty or delayed signaling, or central office failure to disconnect.

Once a line/runk is in the maintenance-busy state, there are three ways to clear the condition and put the line/trunk back into service:

■ Periodic testing of the line/trunk by the system's internal maintenance software to verify proper functioning.

■ Manual clearing of the error from the error log.

■ Manual seizure of the line/trunk at the system operator console or via maintenance dial codes.

Mode Differences

Hybrid/PBX

To provide optimum performance, Automatic Maintenance Busy should be enabled when a Hybrid/PBX system includes trunk pools.

Key and Behind Switch

In the Key and Behind Switch modes, the feature is disabled.

Considerations

- Incoming calls are received and processed normally on lines/trunks in a maintenance-busy state.

- Direct inward dialing (DID) trunks in the Hybrid/PBX mode are not affected by Automatic Maintenance Busy because these trunks can only receive calls.

- 100D (DS1) modules configured as ground-start line/trunks, loop-start lines/trunks, or tie trunks are monitored and maintained by Automatic Maintenance Busy.

- No more than 50 percent of the trunks in a trunk pool are allowed to be placed in the maintenance state at one time, except when the central office has failed to disconnect a trunk (preventing its use) or when an entire trunk module is manually taken out of service (a user-imposed-maintenance-busy state).

  When more than 50 percent of trunks in a pool are in a maintenance-busy state because of either or both of these exceptions, a system alarm oocurs and the red LED next to the Alarm button on system operator consoles goes on.

Feature Interaction

Alarm   The red LED next to the Alarm buttons on system operator consoles goes on and the designated Maintenance Alarm alert device sounds or flashes when more than 50 percent of the trunks in the trunk pool are in a maintenance-busy state.

Automatic Route Selection   When ARS is used to make an outside call, the system selects another trunk in the pool when the first trunk is in the maintenance-busy state.

Pools   To provide optimum performance, Automatic Maintenance Busy should be enabled when a Hybrid/pBX system includes trunk pools.

System Programming

■ Enable or disable Automatic Maintenance Busy.

System -> MaintenBusy

Automatic Route Selection

Description

Automatic Route Selection (ARS) provides preferred routing of calls over selected outside trunks based on the number dialed and the trunks available, With ARS, a Hybrid/PBX system can be programmed to route calls over the least expensive route available when the call is made.

ARS call processing is activated when a user selects a System Access button and dials the ARS access code (usually a 9) plus the telephone number. The system analyzes the digits dialed to select the appropriate ARS table.

ARS Tables

ARS determines the best route for a call by matching telephone numbers with programmed lists, "tables" of area codes, exchanges, and other numbers. The ARS tables areas follows:

Area Code Tables. Many businesses use only one type of trunk, such as a regional WATS trunk for all calls made to a particular area code. These calls are routed according to tables that contain lists of area codes. The system scans only the area code of the number dialed to route the call.

Local Exchange Tables. In-state WATS trunks are used to make calls to particular exchanges within an area code. These calls are routed according to tables that associate the exchanges with the preferred trunk pool. The system scans only the exohange of the number being dialed to route the call.

6-Digit Tables. For some businesses the cost of toll calls to telephone numbers in another area code varies according to the exchange the caller dials. In these cases, the system can be set up to make calls to numbers in a particular area code on different trunk pools, depending on the exchange to which the call is made.

On the tables used to route these calls, an area code is the first entry and the remaining entries are exchanges within the area code. The system scans the first 6 digits of the number that was dialed (the area code and the exchange) to route the call.

1 + 7 Tables. In some areas, callers must dial a 1 and a 7-digit number to call certain exchanges even though the call is within the area code. The 1 + 7 tables contain lists of all the exchanges that require dialing a 1 plus 7 digits. For these areas, the ARS 1 + 7 dial setting must be set in system programming to "within area code." This setting specifies that 1 + 7 tables must be checked when a user dials a 1 and 7 digits. In the areas where the local telephone company does not require that the caller dial a 1, the ARS 1 + 7 dial setting must be set to "not within area code." With this setting, the user is not required to dial the leading 1; however, the system adds the 1 to the dialed number to allow proper routing using the ARS tables.

Note: Setting up 1 + 7 tables speeds call processing. However, users need to be instructed to dial the 1 if these tables are programmed and the ARS 1 + 7 dial setting is set to "within area code". If these tables are programmed and the 1 + 7 dial setting is set to "within area code,' users have two options for making calls to 1 + 7-digit numbers:

■ Users can dial 1, dial the 7-digit number, and wait for ARS to recognize (after a timeout delay) that no more digits are being dialed.

■ Users can dial 1, dial the 7-digit number, and then press #. When the dialing sequence is ended with a #, the system knows that the user is finished dialing and eliminates the timeout delay.

Dial Zero Table. This table routes all calls that are preceded with a 0. (The international dialing code, 011, is treated as a special case and can be put into a three-digit table such as an area code table. If 011 is not specified in a table, international calls are routed through the Dial Zero table.)

Special Number or N11 Table. The N11 table routes calls to the numbers 411, 611, 811, and 911.

Default Local Table. This factory-set table routes local calls to numbers whose exchanges do not match any of the entries on the local exchange tables.

Default Toll Table. This factory-set table routes toll calls to numbers whose area codes do not match any of the entries on either the Area Code tables or 6-Digit tables.

The system can have as many as 20 ARS tables-16 are programmable and 4 (the Dial Zero, Special Number, Default Local, and Default Toll tables) are factory set.

Each table is assigned its own routing pattern that can consist of two subpatterns allowing routing of calls based on the time of day. Each subpattern can contain a sequential list of up to six routes that the system can use to complete a call, the first route being the most cost-effective (such as a WATS trunk) and the sixth being the least cost-effective (such as a local central office trunk).

In addition, each route in a pattern (or subpattern) has an associated Facility Restriction Level (FRL), which ARS uses to control and restrict access to the route. There are seven FRLs, ranging from 0 to 6, where 0 is the least restricted and 6 is the most restricted.

Telephones are also assigned FRLs from 0 to 6, which ARS uses to determine whether callers have permission to use the routes. A telephone with an FRL of 0 has the least ARS privileges (that is, levels 1-6 cannot be used) and a telephone with an FRL of 6 has the most privileges. To use a route, the telephone's FRL must be equal to or greater than the route's FRL.

Other digits or special characters may be required so the system can route a call on a particular trunk pool. For example, some companies use an alternate toll company that requires dialing of the telephone number with pauses and access codes. After the user dials the telephone number, the system automatically adds the required pauses and access code to the front of the telephone number, based upon the particular table used. A maximum of 20 digits can be added to numbers dialed by users.

From 0 to 11 dialed digits can also be programmed to be deleted or absorbed by the system before the dialed number is sent to the central office. For example, if the central office does not require dialing a 1 before an area code, the system can be programmed to absorb that first digit. The system absorbs digits starting with the first digits dialed by the user.

How ARS Works

To make a call in a system that has ARS, a user selects a System Access button and dials the ARS access code (usually a 9) followed by the telephone number. The call is routed over the trunk pool that is the most cost effective. The system determines the best route for the call by checking the telephone number dialed against the numbers (digits) in the ARS tables. ARS eliminates the tables until it finds one containing a match. A match can be made by comparing one, three, or six digits.

The system checks to ensure that the user has the appropriate permission for making each call (including a check for Allowed and Disallowed List assignment). First the dialed number is checked to see if it is an emergency number-for example, fire or police. If so, the call is routed over the main pool, regardless of any restrictions. If it is not an emergency call, the permissions are checked for any call restrictions (outside or toll).

If a user dials "0," ARS eliminates all tables except the Dial Zero table and routes the call by using the table's programmed routes. If a user dials the equal access code (10xxx), the call is routed through the main pool.

If a user dials an 11-digit number that begins with 1 (for example, 1-201-555-1234), ARS first recognizes that it is a toll call (a 1 followed by 10 digits) and eliminates all exchange tables.

ARS then checks the area code tables and 6-Digit tables for a match. If it finds a match on a 6-Digit table, it routes the call accordingly. If it does not find a match on a 6-Digit table, it checks the Area Code tables for a match and routes the call. If a match is not found, the call is routed according to the default toll table.

Once ARS selects the appropriate routing table, it checks the time of day to select the appropriate subpattern and tries to route the call via the first route programmed for the subpattern. ARS then checks the FRL assigned to the first route and to the telephone from which the call is being made.

If the telephone's FRL is equal to or greater than the FRL of the first route (for example, the telephone's FRL is 4 and the route's FRL is 3) and if the route is available, the call is put through. If the route is busy, the FRL of the second route is checked and, if the telephone has the appropriate FRL the call is put through. If fhe second route is busy. the process is repeated for the third route, and so on until ARS finds an available route.

Note: If all routes are in use, Callback can be used to queue the call and wait for an opening in the first route. Callback will not queue a call for any other route.

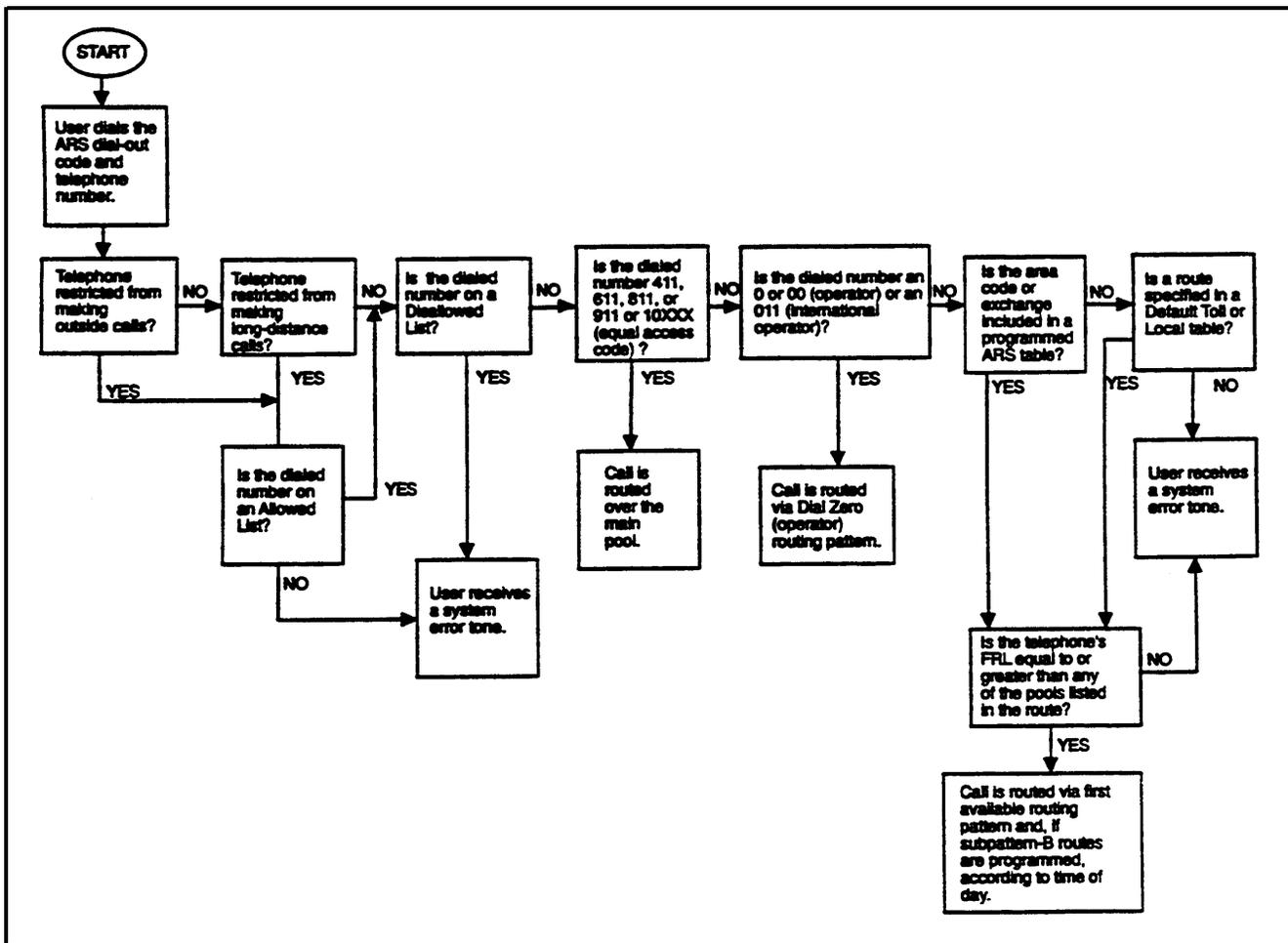The flow chart in Figure 2-1 illustrates the ARS process.

Figure 2-1 ARS Process

Mode Differences

ARS can be used only on systems that operate in Hybrid/PBX mode with trunk pools.

Considerations

■ ARS users must dial a dial-out code (usually 9) to gain access to an outside trunk.

■ The factory setting for the ARS dial-out code is 9.

■ Once a user has dialed the ARS dial-out code, he or she will hear beeps instead of tones as the rest of the number is dialed.

■ A 1 must be dialed before any 10-digit toll call, even if the local telephone company does not require it.

■ ARS restrictions (FRLs) operate independently of dial access to pool restrictions, providing greater flexibility in assigning the type of usage a telephone is allowed.

■ A system can have up to 16 fully programmable ARS routing patterns. Each pattern can contain up to 12 routes (6 per subpattern).

■ The wildcard character (Pause) cannot be used in system programming to enter area code and/or exchanges in ARS tables.

■ Calls made to the equal access code (10xxx) are always routed over the main pool.

■ Users who are restricted from using a particular ARS route will hear a high-low error tone indicating the call cannot be completed.

■ Users can press # after dialing a 1 + 7-digit number to avoid a timeout delay—the delay between the time the last digit is dialed and the time the system recognizes that there are no more digits coming.

■ When ARS is used on rotary-dial trunks, the timeout delay is 24 seconds when zero to two digits are dialed (this includes dialing 00 for the toll operator), 10 seconds when three to six digits are dialed (this includes dialing 010 for the overseas operator), and 5 seconds when more than six digits are dialed or if the only digit dialed is a zero.

■ The factory setting for FRLs for routes and telephones is 3.

■ From 0 to 20 digits can be added by ARS to numbers dialed by the user. The factory setting is 0.

■ From 0 to 11 digits can be absorbed, starting with the first digits dialed by the user. The factory setting is 0.

Feature Interactions

Account Code Entry

When ARS is used on the system, an account code can be entered before or after dialing the telephone number.

Allowed Lists

ARS checks calling restrictions before choosing the route for a call. This prevents users with restricted telephones from dialing numbers that are not included on an Allowed List.

Auto Dial

The ARS code can be programmed before a telephone number on an Auto Dial button.

Automatic Maintenance Busy

When ARS is used to make an outside call, the system selects another trunk in the pool when the first trunk is in the maintenance-busy state.

Callback

When a call is made via ARS and all possible trunk routes are busy, the call can be queued for the first route in the pattern. However, if the FRL for the telephone does not allow the call to be made over the route, the call is not queued.

Calling Restrictions

The use of ARS does not allow users to avoid calling restrictions. The system checks for outward or toll restrictions assigned to the telephone before it selects the best route for making the call. If the ARS Facility Restriction Level (FRL) assigned to the telephone restricts use of the route, the user hears an error tone and the call does not go through. Since FRL assignment determines pools selected in each route, a user may be allowed to select a pool via ARS even if the telephone is restricted from the pool dial-out code.

Direct Station Selector

The LED next to a DSS button for the ARS code is always off.

Directory

System Directory and Personal Directory (MLX-20L telephones only) numbers can include the ARS dial-out code.

Disallowed Lists

The use of ARS does not allow the user to dial numbers on a Disallowed List assigned to the telephone. The system checks all restrictions before selecting the route.

Display

Only the ARS dial-out code and the number dialed are displayed. Digits added by ARS before the dialed number and digits absorbed by ARS are not displayed.

Forced Account Code Entry

If Forced Account Code Entry is assigned to the telephone, the user must enter the code before dialing the ARS dial-out code.

Forward and Follow Me	ARS can be used to select the facility on which to forward calls to an outside telephone number. The user enters the ARS code before the telephone number. The FRL for the call is that of the telephone from which calls are being forwarded.
Night Service	When Night Service with Outward Restriction is programmed, the user must enter the password before dialing the ARS dial-out code unless the telephone is assigned to an Exclusion List or the number is on an Emergency Numbers List.
Personal Lines	ARS cannot be used on personal lines.
Pools	ARS ensures appropriate and cost-effective use of trunk pools.
Recall	Recall cannot be used to hold an outside line if ARS was used to make the call.
Remote Access	Remote Access users can make calls by using ARS. The user dials into the system, enters a barrier code if one is required, and dials the ARS code while listening to the system dial tone. FRLs can be assigned to restrict the routes that remote callers can use. When barrier codes are not used, FRL is assigned to all tie trunks and non-tie trunks and cannot be assigned to individual tie trunks or non-tie lines/trunks. When barrier males are used, FRLs are assigned to individual barrier codes.
Saved Number Dial	The ARS dial-out code is saved with the telephone number dialed.
Speed Dial	Personal Speed Dial and System Speed Dial numbers can include the ARS code.
Station Message Detail Recording	SMDR reports for systems with ARS show all the digits dialed by the user in the "Number" field, including any digits absorbed by digit absorption and the facility used to make the call. The records do not include the ARS dial-out code or any digits added by ARS.
System Access	The ARS FRL assigned to the telephone being used to make the call applies to calls made on a Shared System Access button.
System Numbering	The ARS access code can be renumbered (factory-setting is 9).

Toll Type
In certain areas the local telephone company requires dialing the prefix 1 for certain exchanges. In these cases, the exchanges can be assigned to a 1 + 7 ARS table and the 1 + 7 dial setting must be set to 'within area code' so that people calling numbers in the exchanges do not have to dial the 1.

System Programming

■ Specify the type of table (six-digit, area code, local exchange, or 1 + 7) and the area codes and/or exchanges to be included on the table.

> **Tables -> ARS -> ARS Input**

■ Specify that 1 + 7 tables should be searched when a leading 1 is dialed.

> **Tables -> ARS 1 + 7**

■ Specify time of day when calls are routed by using Subpattern B routing information.

> **Tables -> ARS -> Sub 8 Start or Sub 8 Stop**

■ Identify the trunk pools (up to six) on which calls are to be routed.

> **Table -> ARS -> Sub A Pools or Sub B Pools**

■ Assign or remove the FRL associated with each route.

> **Tables -> ARS -> Sub A FRL or Sub B FRL**

■ Specify the number of digits that need to be absorbed by the system when it routes calls on an identified route.

> **Tables -> ARS -> Sub A Asorb or Sub B Absorb**

■ Specify the digits or special characters that must be added by the system to the number dialed by the user when calls are routed on an identified route.

> **Tables -> ARS -> Sub A Digit or Sub B Digit**

■ Specify the FRL and/or digits that must be added when people dial emergency numbers in the special number or N11 table.

Tables-> ARS -> More -> SpecINumber -> ARS FRL or ARS Digit

■ Specify the pool routing, FRL, and digits or special characters that must be added by the system to the number dialed by the user when calls are routed on the dial 0 table.

Tables -> ARS -> More -> Dial D -> ARS Pool or ARS FRL or ARS Digits

Barge-In

Centralized Telephone Programming	**Programming Code: *58** **MLX Display Label: Barge In**

Description

Barge-In allows a user to contact a co-worker in an emergency or if the user has been given special instructions to interrupt. If the extension is busy, Barge-in bridges the user onto the call. If Do Not Disturb is activated, Barge-in overrides the feature and makes the telephone ring.

To bridge onto a call or override Do Not Disturb on a multiline telephone (excluding queued call consoles), the user dials the extension number by using the dialpad or DSS button and then presses the programmed Barge-In button. On an MLX display telephone or a queued call console (QCC), the user presses the Feature button and selects Barge-In from the display.

A tone, heard by the user and the people on the call, indicates that the user is bridged onto an in-progress conversation. If the user hears ringing, it indicates a Do Not Disturb override.

Considerations

■   Barge-In is used only with a programmed button or by selecting the feature from the display feature codes are not used for Barge-In.

■   QCC system operators can use Barge-In only by selecting the feature from the display.

■   A user cannot program a Barge-in button; the button can be programmed only via centralized telephone programming.

■   Barge-In does not override Privacy.

■   If a user is in the process of dialing and another person uses Barge-In to reach the user, the touch-tones generated by the dialpad cancel the Barge-In tone. As a result, the user may not be aware that someone else is joining the call.

■   If the user presses the Barge-In button while calling an MLX telephone, an extra ring occurs on the MLX telephone. If the user presses the Barge-In button while calling an analog multiline telephone, the call is disconnected.

Telephone Differences

Queued Call Console   To use Barge-In, the QCC system operator dials the extension number, then presses the Feature button and selects Barge-In from the display.

All Other Multiline Telephones	To use Barge-In on all other multiline telephones, the user dials the extension number then presses a programmed Barge-In button or presses the Feature button and dials 58. On an MLX display telephone, the user can also press the Feature button and select Barge-In from the display.
Single-Line Telephones	Single-line telephones cannot use Barge-In.

Feature Interactions

Callback	If Callback is used to request a busy extension or pool and the user is waiting on the line for the queued call, Barge-in cannot be used to interrupt.
Conference	Barge-In can be used to interrupt conference calls; all participants hear the Barge-In tone. Barge-in does not connect the user to a conference call if the conference already has the maximum number of participants. If Barge-in is used to connect to a conference call that involves an outside line/trunk and the person on the outside line/trunk hangs up, the person using Barge-in is also dropped.
Coverage	Barge-In can be used for Individual or Group Coverage calls answered at any receiver's telephone.
Direct-Line Console	Barge-In enhances call handling by allowing the DLC system operator to contact a person who is on a call or is using Do Not Disturb (Barge-in does not override Privacy). If the system operator uses Barge-in for a user who is using Coverage or Forward (including Remote Call Forward), the call from the system operator is not directed to the destination telephone.
Direct Station Selector	Barge-in can be activated by pressing a DSS button corresponding to a user's extension number followed by programmed Barge-In button.
Display	Barge-In appears on the display as a feature choice only on system operator consoles. On an MLX display telephone receiving a Barge-in call, the message "Barge-In" and either the name or extension number of the person joining the call remains on the display until the receiving telephone user hangs up.
	If Barge-in is denied, an error message is not displayed on the calling telephone to indicate that the attempt was not successful.
Do Not Disturb	If Do Not Disturb is activated Barge-In overrides the feature and makes the telephone ring.

Forward and Follow Me   When a forwarded call is answered at the destination station, Barge-In can be used to join the call only by dialing the extension number for the destination station (not the extension for the originating station). Barge-In cannot be used to join a call forwarded to an outside telephone number.

Group Calling   Barge-In can be used for calling group members, but the member's extension must be used instead of the calling group extension. If a user tries to use Barge-In after dialing the calling group extension number and waiting in the queue, the feature has no effect.

If a person uses Barge-In to reach another user who is waiting in a calling group queue, the call is removed from the queue and both people and the delay announcement, if programmed are connected if a person uses Barge-in for the delay announcement extension and the device is playing a message to a caller, the call is removed from the queue and both people and the delay announcement are connected.

Headset Options   If Barge-in is used to contact a user with Headset Auto Answer, the call is automatically answered.

Messaging   If Barge-in is used to contact a user with a posted message, the caller's telephone does not display that message.

Paging   Barge-In cannot be used to join speakerphone or loudspeaker paging calls.

Privacy   Barge-In does not override Privacy. The user hears a busy signal when trying to use Barge-ln to contact a person using Privacy.

Queued Call Console   Barge-In enhances call handling by allowing the QCC system operator to contact a person who is busy on a call or is using Do Not Disturb. The use of Barge-In does not override Privacy. On a QCC, Barge-In can be used only by pressing the Feature button and selecting it from the display.

Barge-In can be used to join only an inside call to a QCC system operator and only if the caller's extension number is dialed instead of the QCC system operator's extension number. If a user tries to use Barge-In after dialing a QCC system operator's extension and waiting in the QCC queue, the feature has no effect and the user hears an error tone. If the error tone times out while the call is still in the QCC queue, the call is disconnected. However, if a QCC system operator becomes available before the error tone times out, the error tone is removed and the call is delivered to the system operator normally.

Related Features

■ Voice Announce to Busy

Callback

Extension Programming

Programming Code:
  Automatic Callback On: *12
  Automatic Callback Off: **12
  Selective Callback: *55
Feature Code:
  Selective Callback: 55
  Cancel Callback Request: *55 (single-line telephones only)
MLX Display Label:
  Automatic Callback On: Cback Auto, on [CbckA, On]
  Automatic Callback Off: Cback Auto, off [CbckA, off]
  Selective Callback: Cback Sel [cbcks]

Description

Callback provides users with an easy way to complete calls to busy extensions and, in the Hybrid/PBX mode, to outside numbers when calls are made by using a pool in which all trunks are busy.

The following two types of Callback can be programmed via extension or centralized telephone programming:

- ■ **Automatic.** Callback is activated automatically when the user reaches a busy extension or when all trunks in a pool are busy.

- ■ **Selective** (the factory setting). Callback is activated only when a user chooses by either dialing a feature code or, on multiline telephones, by pressing a programmed Callback button. On an MLX display telephone, a user can also select the feature from the display.

When Automatic Callback is programmed, and a user reaches a busy extension or trunk pool, the user hears the queuing tone (five short beeps) instead of the busy tone to indicate that the system is putting the call into the Callback queue.

When Selective Callback is programmed and the user reaches a busy extension, the user must activate Callback while listening to the busy tone. If the user tries to make a call by using a pool in which all trunks are busy, the user hears a fast busy signal immediately after dialing the pool dial-out code. After activating Callback and hearing the queuing tone, the user can dial the telephone number and the call is added to the Callback queue.

With either Automatic Callback or Selective Callback, a user can either stay on the fine until the call is completed or hang up. If the user stays on the line, the red and green LEDs are on next to the Intercom or System Access button used to make the call. When the busy extension or pool is available, the user hears the dequeuing tone (three short beeps) and the call is automatically completed.

■■■■■■■■■■■■■■■■■■

If the user hangs up, the green LED flashes next to the Intercom or System Access button used to make the call to indicate that the call is on hold. When the busy extension or pool is available, the user hears a priority ring (four bursts of ring on an MLX telephone and three bursts of ring on an analog multiline telephone and single-line telephone). If the user does not answer the Callback call within the number of rings programmed for the system (1-6), the Callback request is canceled.

Telephone Differences

Queued Call Console

A queued call console (QCC) system operator cannot use Callback.

All Other Multiline Telephones

On all other multiline telephones, Selective Callback is activated by pressing a programmed Callback button or by pressing the Feature button and dialing 55. On MLX display telephones, Selective Callback is also activated by pressing the Feature button and selecting the feature from the display. If the user is on another call when the system tries to callback, the user hears an abbreviated ring.

A multiline telephone user can cancel a Callback request by pressing the Intercom or System Access button used to make the call, lifting the handset, pressing the Drop button, and pressing the Intercom or System Access button again. The red and green LEDs next to the button go off, and the request is canceled.

Single-Line Telephones

On single-line telephones, Selective Callback is activated by dialing #55 while listening to the busy tone. This is an exception to only being able to activate features while listening to internal dial tone. The user can make and receive other calls while waiting for the call to be completed. The request remains in queue until the single-line user who initiated the request is available.

A single-line telephone user can cancel a Callback request by lifting the handset and dialing #*55 while listening to internal dial tone. The system sends a confirmation tone to indicate that the request is canceled.

A single-line telephone user cannot use Callback if another call is on hold.

A waiting incoming outside call rings at a single-line telephone before any calls queued for that telephone.

Mode Differences

Hybrid/PBX

In the Hybrid/PBX mode, Callback can be used for both busy extensions and outside calls on pools where all trunks are busy.

Key and Behind Switch

In the Key and Behind Switch modes, Callback can be used only for busy extensions, not for outside lines.

Considerations

■ Callback cannot be used for lines or pools assigned to buttons on a telephone.

■ No more than 40 dialed digits can be included in a queued call.

■ A maximum of 64 calls can be queued in the system at one time. A user who tries to queue the 65th call receives a busy tone.

■ A multiline telephone user can queue a maximum of 64 calls (the system limit) and can queue more than one call to the same extension.

■ A single-line telephone can queue only one call at a time.

■ If more than one-call is waiting for the same extension or trunk, the call that has been in queue the longest is connected first.

■ If the Callback originator does not answer the call from the system within the number of rings (1-6) programmed, the call is dropped from the queue and no additional attempts to make the call are made. The number of rings programmed for Callback refers to the number of rings at the originating station, not the destination station.

■ When a call is waiting in queue for an extension, no new calls are sent to the extension until after the queued call is completed.

Feature Interactions

Account Code Entry   An account code must be entered before the user activates Callback. If not, the user must wait until after the call is connected before entering the account code. Account codes cannot be entered while the call is queued.

Automatic Route Selection   When a call is made via ARS and all possible trunk routes are busy, the call can be queued for the first route in the pattern. However, if the Facility Restriction Level (FRL) for the telephone does not allow the call to be made over the route, the call is not queued.

Barge-In   If Callback is used to request a busy extension or pool and the user is waiting on the line for the queued call, Barge-In cannot be used.

Calling Restrictions   In the Hybrid/PBX mode, a user with a restricted telephone can use Callback for a busy pool because restrictions are based on the specific trunk being used to make the call. When a trunk in the busy pool is available, the system checks for restrictions assigned to the telephone. If the telephone is restricted, the user hears a fast busy signal to indicate that the call is not dialed.

Call Waiting   When Automatic Callback is used to queue a call at an extension that has Call Waiting, Callback overrides Call Waiting—the user with Call Waiting does not hear the Call Waiting tone, and the call is queued until the extension becomes available.

Conference	With Automatic Callback, the call is automatically queued; however, if the user tries to add the queued call to the conference, the system returns a busy tone. If a user with Selective Callback tries to queue a call while setting up a conference, the system returns a busy tone. The user must press the Drop button and the line button used for the call to drop the busy tone from the conference.
Coverage	The sender and all coverage receivers must be busy before a call to a sender can be queued. The call is sent to coverage before it is put in the Callback queue. Once a call is in the Callback queue, it is not sent to coverage again. The Callback call indicating that a busy extension or pool is available is not eligible for Individual or Group Coverage.
Display	When a call is queued via Automatic Callback on MLX and analog multiline telephones or via Selective Callback on analog multiline telephones, the display shows a feedback message. When an MLX telephone user activates Selective Callback, the display prompts the user to enter the telephone number. After the number is dialed, the display provides the same feedback as on an Automatic Callback call. When the queued call rings the user's telephone, the display indicates that it is a returning Callback call.
Do Not Disturb	Calls to extensions that are using Do Not Disturb are not eligible for Callback queuing. If the Callback originator is using Do Not Disturb, the system overrides the feature and the telephone rings when the busy extension or trunk is available.
Extension Status	In the hotel/motel mode, a station in ES state 1 or 2 cannot use Callback to request busy pools.
Forced Account Code Entry	An account code must be entered before Callback is activated. If not, the user hears a busy tone.
Forward and Follow Me	If a user queues a call and then uses Forward, Remote Call Forward, or Follow Me, the call does not ring back at the destination extension or telephone number the Callback call returns only to the forwarding telephone.
	When a user with Automatic Callback activated selects a pool on which to forward calls to an outside number and all trunks in the pool are busy, the caller hears queuing tone when the call is queued for the busy pool. When the pool is available, the caller hears the dequeuing tone and the call is forwarded.
	When a user with Selective Callback selects a pool on which to forward calls to an outside number and all trunks in the pool are busy, the caller hears a busy signal to indicate all trunks in the pool are busy. If the call is from an inside caller, the caller can activate Callback and the call is queued for the forwarding telephone and not the busy pool. Outside callers cannot use Callback when the forwarding telephone is busy.

Group Calling

Calls made to a calling group are not eligible for Callback since the call rings into the calling group's queue. However, Callback can be used for calls to individual calling group member extensions or to the delay announcement device. Calling group calls are not sent to the group member telephone when the calling group member uses Callback for a busy extension or pool, or if another person used Callback to reach a calling group member and the Callback call is ringing on that person's telephone.

Headset Options

Callback calls are answered automatically by using Headset Auto Answer, but the user hears the Callback dequeuing tone instead of the Auto Answer tone. When both calling and receiving users have headsets with Headset Auto Answer activated (MLX telephones only), the person being called hears zip tone when the Callback call is completed but the Callback originator does not hear zip tone or dequeuing tone.

If the user with Headset Auto Answer uses Do Not Disturb, Callback calls override Do Not Disturb and are automatically answered.

Hold

Pressing the Hold button while waiting for a queued call is the same as hanging up-the call is disconnected. If a system operator presses another line button, an Auto Dial button, or a DSS button while waiting on the line for a queued call, the call is disconnected-Automatic Hold does not work.

Line Request

Returning Callback calls cancel Line Request.

Multi-Function Module

Both Automatic and Selective Callback can be used from an MFM; however, a callback call cannot be manually canceled.

Music-on-Hold

An outside caller waiting in the Callback queue hears Music-on-Hold.

Paging

A speakerphone paging (voice-announced inside) call that is queued via Callback automatically becomes a ringing call. Callback cannot be used for calls to a speakerphone paging group. Systems with loudspeaker paging can be setup to allow calls to be queued for the loudspeaker paging system by placing the loudspeaker paging port in its own pool and having users access the paging system via the pool. When the pool is busy, the "call" can be queued.

Park

Calls waiting in a Callback queue cannot be parked.

Personal Lines

The Callback feature cannot be used to request a busy personal line.

Pickup

A Callback request cannot be picked up at another telephone.

Pools	Callback can be used to complete calls to outside numbers in the Hybrid/PBX mode only when the call is made by using a pool in which all trunks in the pool are busy.
Queued Call Console	Calls to QCCs are not eligible for Callback since the calls ring into the QCC queue. Callback cannot be used on a QCC.
Reminder Service	Reminder Service calls cannot be queued by using Callback.
Remote Access	If the system is programmed for Remote Access Callback, Remote Access users can use Callback. The user cannot hang up but must wait on the line until the extension or trunk pool is available. The user hears Music-On-Hold if it is programmed.
Speed Dial	When a Stop character is programmed as part of a Speed Dial number, the user must stay on the line and wait for the Callback call and then reactivate Speed Dial. This signals the system to continue dialing the digits after the Stop character.
Station Message Detail Recording	SMDR begins measuring the duration of Callback calls when the call is completed.
System Access	Callback can be used on Intercom or System Access buttons. In the Hybrid/PBX mode, when Callback is used on a Shared System Access button, the Callback from the system rings and the LED next to the button flashes only at the telephone that originated Callback.
	If a user other than the person originating the Callback selects a Shared System Access button with a queued call and lifts the handset, the person hears the queuing tone and the green LED on the originator's telephone goes from flashing to steady. If the second person hangs up, the green LED on the originator's telephone goes back to flashing and the system directs the Callback call to the originator. If the second person does not hang up, the system directs the call to the second person and not to the Callback originator.
Transfer	A queued Callback call cannot be transferred, but calls transferred to busy extensions are eligible for callback. When a user reaches a busy extension while transferring a call, Automatic Callback or Selective Callback can be used to queue the call before completing the transfer. The caller hears ringback or Music-On-Hold as with any transfer.

When the extension is available, the call is transferred to the extension automatically. If the extension is not available before the Transfer Return interval expires, the call is removed from the Callback queue and returned to the originator.

If a single-line telephone user with a call queued for a busy station completes a transfer to a busy pool, the caller hears a fast busy tone. The transfer is considered complete, and the call is not returned to the originator.

System Programming

■ Specify the number of rings (1-6) to the Callback originator before the system cancel Callback request. The factory setting is 3 rings.

```
Options -> Callback
```

■ Enable or disable the use of Callback for busy trunk pools for Remote Access users.

```
LinesTrunks -> RemoteAccss -> AutoQueuing
```

Related Features

■ Automatic Route Selection

■ Line Request

■■■■■■■■■■■■■■■■■■■■■■■■■■■■

Calling Restrictions

Description

Calling restrictions help a company manage communications costs and resources. Through calling restrictions, users at individual telephones can be restricted from making certain types of calls:

■ **Outward Restriction.** The telephone cannot be used to make outside calls. Incoming calls can be answered and inside calls can be made and received.

■ **Toll Restriction.** The telephone cannot be used to make toll calls. Incoming toll calls can be answered, and local and inside calls can be made and received.

■ **Pool Dial-out Code Restriction** (Hybrid/PBX only). The telephone cannot be used to dial a pool dial-out code. This restricts outgoing calls from specific pools and can be used to reserve pools for specific purposes-for example, for data communications only.

See "Automatic Route Selection" in this chapter for more on ARS.

■ **Automatic Route Selection Facility Restriction Level (FRL)** (Hybrid/PBX only). The telephone is restricted to certain routes. When Automatic Route Selection (ARS) is used, an FRL is assigned to control or restrict access to specific routes in an ARS table. There are seven FRLs assigned to routes, ranging from 0 to 6, where 0 is the least restricted and 6 is the most restricted.

FRLs from 0 to 6 are also assigned to telephones and are used to determine whether callers have permission to use the routes. However, the FRL assigned to a telephone is the opposite of an FRL assigned to a route. In other words, a telephone with an FRL of 0 has the fewest ARS privileges (that is, levels 1-6 cannot be used), and a telephone with an FRL of 6 has the most privileges. To use a route, the telephone must have an FRL equal to or greater than the route's FRL

See "Allowed Lists" and "Disallowed Lists" in this chapter for details.

If the restrictions are too limiting, an Allowed List can be used in combination with calling restrictions. An Allowed List is a list of telephone numbers (such as emergency numbers) that a user with an outward-or toll-restricted telephone can dial. If no calling restrictions are assigned to a telephone or to supplement calling restrictions, a Disallowed List can be used. A Disallowed List is a list of telephone numbers (for example, 900 numbers) that cannot be dialed from a telephone.

Mode Differences

Hybrid/PBX   In the Hybrid/PBX mode, all calling restrictions can be assigned.

Key and Behind Switch   In the Key and Behind Switch modes, outward and toll restrictions can be assigned, while the pool dial-out code restriction and ARS FRL cannot be assigned.

Considerations

■ In the Hybrid/PBX mode, an outward-restricted telephone cannot be used to make an ARS call except to emergency numbers.

■ Users with Pool buttons on their telephones can use the pool even if the pool dial-out restriction is assigned to the telephone.

■ Only outgoing calls are affected; users can receive inside, local, and toll calls on restricted telephones and can join any type of call in progress.

■ If a tip/ring equipment user does not dial with 15 seconds after hearing an outside dial tone, the touch-tone receiver (TTR) is removed from the call. Once the TTR is removed, the user has approximately nine seconds before the local telephone company disconnects the call. After the disconnection the user can override calling restrictions and dial undetected by the system.

■ When a user with an outward-restricted telephone presses a dialpad button while on a call, the call is disconnected, the user hears a fast busy, and the line/trunk is released. When the dialpad is used, the system assumes that the user is trying to make an outside call, which is not allowed because of the outward restriction assigned to the telephone.

Feature Interactions

Allowed Lists

When used with Calling Restrictions, Allowed Lists can permit the dialing of specific numbers (such as emergency numbers) from an outward- or toll-restricted telephone.

Auto Dial

A user with an outward-restricted telephone cannot dial an outside number by using an Auto Dial button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using an Auto Dial button unless the number is on an Allowed List assigned to the telephone.

Automatic Route Selection

The use of ARS does not allow users to avoid calling restrictions. The system checks for outward or toll restrictions assigned to the telephone before it selects the best route for making the call. If the ARS Facility Restriction Level assigned to the telephone restricts use of the route, the user hears an error tone and the call does not go through. Since FRL assignment determines pools selected in each route, a user may be allowed to select a pool via ARS even if the telephone is restricted from the pool dial-out code.

Callback

In the Hybrid/PBX mode, a user with a restricted telephone can use Callback for a busy pool because restrictions are based on the specific trunk being used to make the call. When a trunk in the busy pool is available, the system checks for restrictions assigned to the telephone. If the telephone is restricted, the user hears a fast busy signal to indicate that the call is not allowed.

Considerations

A user with an outward-restricted or toll-restricted telephone cannot add an outside participant to a conference unless the participant's number is on an Allowed List assigned to the telephone.

However, if a conference originator with an outside caller presses the Conference button, selects an outside line, and presses the Conference button again before dialing a number, the outside caller can dial a toll call, thereby overriding calling restrictions assigned to the conference originator's telephone. The toll call is billed to the conference originator's company.

Direct-Line Console

Calling restrictions can be assigned to DLCs. Since restrictions apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.

Disallowed Lists

Disallowed Lists can be assigned to restricted telephones. Disallowed Lists take precedence over Allowed Lists. If a telephone number is on both an Allowed List and a Disallowed List and both are assigned to an individual telephone, the user cannot dial the number.

Display

The "Call Denied" message is shown on an MLX display telephone when a call is denied because of calling restrictions. The message is not shown on an analog multiline display telephone.

Extension Status

To allow users in the hotel/motel configuration of Extension Status to dial emergency or other selected numbers when the telephone is in status 1 or 2, access must be assigned to an Allowed List.

Forward and Follow Me

A user with an outward-restricted telephone cannot forward calls to an outside number unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot forward calls to a toll number unless the number is on an Allowed List assigned to the telephone. No error tone sounds when the user with a restricted telephone activates the Forward feature; however, when a call is received at the station, the system checks restrictions and denies the forward if the number is not on the Allowed List.

Night Service

For Night Service with outward restriction, a Night Service emergency Allowed List must be created consisting of emergency numbers that can be dialed from any telephone without dialing the password. Any restrictions assigned to a telephone on the exclusion list are in effect when Night Service is activated.

Personal Line

A user with an outward-restricted telephone cannot dial an outside number on a Personal Line button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number on a Personal Line button unless the number is on an Allowed List assigned to the telephone.

Pools	Specific pools can be restricted from being used for outgoing calls by assigning a pool dial-out code restriction to telephones.
Queued Call Console	Calling restrictions can be assigned to QCCs. Since calling restrictions apply to telephones used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.
Speed Dial	When a marked System Speed Dial code is used to dial a number and the number includes a toll telephone number in addition to an access number, the dialed number overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.
	A user with an outward-restricted telephone cannot dial an outside number by using Personal Speed Dial or System Speed Dial (excluding a marked System Speed dial code) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using Personal Speed Dial or System Speed Dial (excluding a marked System Speed dial code) unless the number is on an Allowed list assigned to the telephone.
System Access	Calling restrictions assigned to the telephone being used to make the call apply to calls made by using a Shared System Access button.
Touch-Tone or Rotary Signaling	If a tip/ring equipment user does not dial within 15 seconds after hearing an outside dial tone, the touch-tone receiver (TTR) is removed from the call. Once the TTR is removed, the user has approximately nine seconds before the local telephone company disconnects the call. After the disconnection the user can override calling restrictions and dial undetected by the system.

System Programming

■ Assign or remove outward or toll restriction to individual telephones.

Extensions -> Restriction

■ Assign or remove pool dial-out code restriction to individual telephones.

■ Assign or remove the ARS FRL associated with each route.

Table -> ARS -> Sub A FRL or Sub B FRL

■ Assign or remove ARS FRL to or from individual telephones

Extensions -> More -> ARS Restrct

Related Features

■ Allowed Lists
■ Automatic Route Selection
■ Disallowed Lists

Call Waiting

Extension Programming

Programming Code:
  Call Waiting On: *11
  Call Waiting Off: **11
Feature Code:
  Call Waiting Pickup: 87
MLX Display Label:
  Call Waiting On: Call Waiting, On [CWait,On]
  Call Waiting Off: Call Waiting, Off [CWait,Off]

Description

When a telephone is programmed with Call Waiting, a user who is on a call hears a tone when another call is received. For an inside call, the user hears one beep; for an outside call, the user hears two beeps. MLX display telephone users also see "Call Waiting" on the display. The caller hears a special ringback to indicate that the telephone is busy and that the Call Waiting tone has been sent.

The user hears a call waiting tone for the following types of calls that ring on an Intercom or System Access button:

■ An inside call

■ A call received on a Direct Inward Dial (DID) trunk (Hybrid/PBX only)

■ A call from a Remote Access user

■ A call received on an automatic dial-in tie trunk

The user does not hear a Call Waiting tone for calls received on a personal line unless the business subscribes to the Call Waiting service from the local telephone company.

A multiline telephone is considered busy when no System Access or intercom button is available for incoming calls and, if Coverage is programmed, all coverage points are busy. A single-line telephone is considered busy when a call is ringing on the telephone or the user has lifted the handset and, if Coverage is programmed, all coverage points are busy. A user can have more than one call waiting.

The user receiving the Call Waiting tone has these options:

■ Ignore the new call and continue with the current call. The caller continues to hear the special ringback.

■ Complete the current call, hang up, and answer the waiting call when it rings. The caller hears normal ringback.

■ Put the current call on hold and answer the new call (multiline telephones in the Key and Behind Switch modes do not have this option).

A telephone can be programmed with Call Waiting on or Call Waiting off. The factory setting is Call Waiting off at all stations.

Telephone Differences

Queued Call Console

QCC system operators cannot have Call Waiting.

All Other Multiline Telephones

To put the current call on hold and answer the new call, the multiline telephone user in the HybridFBX mode presses the Hold button, presses the System Access Originate Only button, and picks up the waiting call by pressing the Feature button and dialing 87.

Single-Line Telephones

To put the current call on hold and answer the new call, the single-line telephone user presses and releases the Recall button or switchhook, and picks up the waiting call by dialing #87.

If the single-line telephone user presses and releases the Recall button or the switchhook after picking up a waiting call, the call that was picked up is disconnected and the user is reconnected to the original call. If the user hangs up after picking up a waiting call, the picked-up call is disconnected and the Transfer feature is originated for the first call (the original call goes on hold and Transfer Return applies).

Note: If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC 3178-NHL and 2500MMGK-PEC 3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to put the current call on hold and answer the new call..

Mode Differences

Hybrid/PBX

If a multiline telephone in the Hybrid/PBX mode does not have a System Access Originate only button assigned or available, the user cannot pickup the waiting call.

Key and Behind Switch   If a multiline telephone in the Key or Behind Switch mode does not have an
Intercom Originate Only button assigned or available, the user cannot pickup
the waiting call.

Considerations

- Call Waiting is not activated if a line button of the appropriate type (such as
  Intercom or System Access) is available to receive a call.

- A telephone can have more than one call waiting at a time.

- If a user is in the process of dialing and Call Waiting is being used to reach
  the user, the touch-tones generated by the dialpad cancel the Call Waiting
  tone. As a result, the user may not be aware that a call is waiting.

- If a single-line telephone with a timed disconnect is used (for example AT&T
  models 2500YMGK-PEC 3178-NHL and 2500MMGK-PEC 3101-ETR),
  pressing the switchhook automatically disconnects the call. With this type of
  telephone, the Recall button must be used instead of the switchhook to put
  the current call on hold and answer the new call.

- An extension programmed as a fax port can activate Call Waiting so callers
  can wait until a fax machine is available. To prevent disruption of an in-
  progress fax message, a Call Waiting tone is not sent to an extension
  programmed as a fax port.

Feature Interactions

Callback   When automatic Callback is used to queue a call at an extension that has Call
Waiting, Callback overrides Call Waiting. The user with Call Waiting does not
hear the Call Waiting tone, and the call is queued until the extension becomes
available.

Camp-on   A user with no available buttons to receive a transferred call hears the Call
Waiting tone when a co-worker uses Camp-On to transfer a call, even if Call
Waiting is not activated.

Conference   A Call Waiting tone is only heard by the person receiving the call and not by
other conference participants. If the conference originator reaches a busy
extension, hears the call waiting special ringback, and tries to add the call to the
conference, the system returns a busy tone. The user must press the Drop
button and then press the line button used to call the busy extension to drop the
busy tone from the conference.

Coverage   A call to a sender with Call Waiting activated goes to Individual and/or Group
Coverage first. If all coverage areas are busy, the sender receives the Call
Waiting tone.

If a sender uses Coverage On/Off to prevent calls from going to Coverage
receivers after hearing a Call Waiting tone, the waiting call does not go to
Coverage, but subsequent calls do.

Direct-Line Console

When the DLC system operator uses Camp-On to transfer a call to a busy extension, the call is placed in the Call Waiting queue and the caller hears the Call Waiting tone whether or not the extension has the Call Waiting feature activated.

If the system is programmed for One-Touch Transfer with automatic completion, the system operator uses Camp-On by pressing the Transfer button, dialing the extension manually, activating Camp-On, hanging up, and pressing another line button or the Transfer button again. If the system operator presses an Auto Dial or DSS button, the transfer is automatically completed and Camp-On cannot be used.

Display

When a user has a call waiting "Call-Waiting" is-shown on the display.

Forward and Follow Me

Call Waiting does not apply to forwarded calls since the system tries the destination telephone instead of the forwarding telephone. However, if the call is not forwarded for any reason (the line/trunk selected is an unreliable loop-start line/trunk), call waiting functions normally.

Group Calling

Calls made to a calling group are not eligible for Call Waiting since the call rings into the calling group's queue. However, call waiting can be used for calls to individual members of the calling group.

Hold

A person with all calls on hold cannot hear the Call Waiting tone.

Paging

Call Waiting cannot be used for Group Paging calls to busy extensions.

Personal Lines

A user does not hear a Call Waiting tone for calls received on a personal line unless the business subscribes to the Call Waiting service from the local telephone company.

Pickup

Pickup features cannot be used to answer a waiting call at another telephone.

Queued Call Console

QCC system operators are not eligible for Call Waiting.

A QCC system operator can release a call to a busy extension by selecting Camp-On from the display or by pressing the Release button. If Camp-On is used, the call does not return to the QCC queue until the Camp-On return interval expires. If the system operator presses the Release button, the extension being called receives the Call Waiting tone (not Camp-On) and the call returns to the QCC queue when the Transfer return interval expires.

If the system is programmed for automatic extended call completion, to use Camp-On, the system operator must press the Start button, dial the extension manually, activate Camp-On, and press Release. If the system operator presses a DSS button, the transfer is automatically completed and Camp-On cannot be used.

Reminder Service Reminder Service calls are not eligible for Call Waiting.

Station Message Detail Recording SMDR does not begin measuring the duration of Call Waiting calls until the call is answered.

System Access A telephone is considered busy when all Intercom or System Access (excluding Intercom or System Access Originate Only) buttons are in use. The user can dial the Call Waiting feature code to pickup a waiting call only when an Intercom, System Access Originate Only, or Shared System Access (Hybrid/PBX only) button is available.

Transfer If a transfer is completed to a busy telephone, the user at the destination telephone hears the Call Waiting tone, if programmed, and the caller hears Call Waiting ringback. If call waiting is not programmed, the call waits in queue until the Transfer Return Interval expires. Calls answered by using Call Waiting Pickup cannot be transferred.

Related Features

■ Hold

Camp-On

Extension Programming

Programing Code: *57
Feature Code: 57
MLX Labels: Camp On [Camp]

Description

Camp-On allows a user to complete a transfer to a busy telephone. The call is put on hold until the telephone can receive a call, then rings through automatically. While the call is on hold, the caller (inside or outside) hears ringback and the person at the busy telephone hears a tone to indicate that a call is waiting.

If the call is not answered within the programmed Camp-On Return interval (30-300 seconds), the call returns to the originator. The originator hears a priority ring-four bursts of ring on an MLX telephone and three bursts of ring on an analog multiline telephone or single-line telephone-to indicate a returning Camp-On call.

Camp-On can also be used to complete a transfer to an extension that is not busy. This can increase the amount of time before the call returns to the originator because the return is timed according to the Camp-On Return interval instead of the Transfer Return Interval (1-9 rings; the factory setting is 4 rings).

Camp-On can be activated by using either a programmed button or a feature code.

Telephone Difference

Queued Call Console

Camp-On can be used when a QCC system operator hears ringing, a busy tone, or Call Waiting ringback while transferring a call. To use Camp-On to complete the transfer, the system operator presses the Feature button and selects Camp-On from the display.

All Other Multiline Telephones

Camp-On can be used when a multiline telephone user hears ringing, a busy tone, or Call Waiting ringback while transferring a call. To use Camp-On to complete the transfer, the user presses a programmed Camp-On button or presses the Feature button and dials 57. On MLX display telephones, the user can also press the Feature button and select Camp-On from the display.

Single-Line Telephones

Calls can be camped onto single-line telephones, but single-line telephone users cannot use Camp-On.

Considerations

- A Camp-On Return interval of 30-300 seconds in increments of 10 seconds can be programmed. The factory setting is 90 seconds.

- Using Camp-On to complete a Transfer to a busy extension permits calls to wait for a longer period before the call returns to the originator (up to 300 seconds).

- A user hears a Call Waiting tone when a call is camped on even if Call Waiting is not programmed on the telephone.

- Multiple calls can be camped onto individual telephones.

- No error tone sounds if a user tries to use Camp-On but is unsuccessful (for example, while listening to the system dial tone).

Feature Interactions

Call Waiting

A user with no available buttons to receive a transferred call hears the Call Waiting tone when a co-worker uses Camp-onto transfer a call, even if Call Waiting is not activated.

Coverage

All Individual and/or Group Coverage points must be busy before a call can be camped on to a sender's telephone. Coverage calls answered by any type of receiver can be camped on to another user.

Direct-Line Console

When a DLC system operator uses the Camp-On feature to transfer a call to a busy telephone, the call is placed in the Call Waiting queue and the caller hears the Call Waiting tone whether or not the user has the Call Waiting feature activated.

If the system is programmed for One-Touch Transfer with automatic completion, the system operator uses Camp-On by pressing the Transfer button, dialing the extension manually, activating Camp-On, hanging up, and pressing another line button or the Transfer button again. If the system operator presses an Auto Dial or DSS button, the transfer is automatically completed and Camp-On cannot be used.

Direct Station Selector

When Camp-On is used to complete a call transfer and the call returns, the DSS button for the extension where the call was transferred goes off and does not flash as it does for a Transfer return or Park return.

Display

After Camp-On is activated, the display on an MLX display telephone shows "Camp On:" and the caller's extension or name.

Do Not Disturb

A Camp-On call does not ring when Do Not Disturb is activated.

Group Calling

Users can transfer calls to a calling group by using Camp-On, but the calls do not return to the originating telephone, even if it is not answered within the programmed Camp-On Interval.

Line Request

Returning Camp-On calls cancel Line Request.

Music-on-Hold

When Camp-On is used to complete a transfer of an outside call to an extension, whether it is busy or not, the caller hears ringback during the transfer even if Music-on-Hold is programmed as the transfer audible.

Paging

Camp-On cannot be used for calls to busy speakerphone paging groups.

Queued Call Console

A Camp-On button cannot be programmed on a QCC. Instead, a QCC system operator can release a call to a busy extension by selecting Camp-On from the display. The call does not return to the QCC queue until the Camp-On return interval expires. If the system operator presses the Release button, the extension being called receives the Call Waiting tone (not Camp-On) and the call returns to the QCC queue when the Transfer Return interval expires.

To use Camp-On when the system is programmed for Automatic Extended Call Completion, the System operator must press the Start button, dial the extension manually, activate Camp-On, and press Release. If the system operator presses a DSS button, the transfer is automatically completed and Camp-On cannot be used.

Station Message Detail Recording

If an incoming call is camped-on but is not picked up by the called extension, the extension of the user that activated Camp-On is shown in the "Station Extension" field of the SMDR report. If an incoming call is camped-on and picked up by the destination extension, the destination extension is shown in the "Station Extension" field.

Transfer

A transfer can be completed by using the Camp-On feature whether or not the destination extension is busy. When the feature is used, the Camp-On Return Interval is used instead of the Transfer Return Interval. If a user presses the Camp-On button or dials the Camp-On feature code while transferring a call to an outside number, the call to the outside number is disconnected. The original call remains on hold.

System Programming

■ Change the Camp-On Interval (30 seconds-300 seconds in increments of 10 seconds). The factory setting is 90 seconds.

> **Options -> CampOn**

Related Features

■ Call Waiting

■ Hold

■ Transfer

Conference

Extension Programming	**Behind Switch Mode Only:**
	Programming Code:
	  Conference: ***772**
	  Drop: *773
	 MLX Display Label:
	  Conference: **Conference [Conf]**
	  Drop: Drop

Description

Through Conference, a user can establish a conference call by using a combination of inside and/or outside lines. Conference calls originated from multiline telephones can have a total of five participants-the originator plus two outside lines and two extensions. Conference calls originated from single-fine telephones can have a total of three participants-the originator plus two others in any combination of inside or outside lines.

A user can consult privately with each participant before adding the person to the conference. Anyone who shares an outside line or System Access button with the user can join the conference on that button and is counted as a participant.

A multiline telephone user can selectively drop conference participants while the conference is in progress by using the Drop button. However, a queued call console (QCC) system operator cannot selectively drop participants from a conference. When the QCC system operator presses the Drop button, only the most recently added participant is dropped. Sligle-line telephone users can drop the most recently added participant from the conference by pressing and releasing the Recall button or switchhook.

The conference originator can leave the conference by pressing the Hold button (the conference continues). If a conference originator (excluding a QCC system operator) leaves a conference by either hanging up or selecting another line, the entire conference is disconnected.

A QCC system operator can press the Release button after originating a conference involving three participants (including the system operator), which disconnects the system operator from the conference but leaves the other participants connected. A QCC system operator cannot, however, release a conference involving four or five participants. if the QCC system operator hangs up or selects another Call button, the conference is put on hold.

Telephone Differences

Queued Call Console

A QCC system operator arranges a conference call by pressing the Conference button after receiving a call or dialing the first outside number or extension. The green LED next to the Call button flashes to indicate the person is on hold for the conference. An outside participant hears Music-On-Hold if it is programmed; an inside participant hears nothing. The QCC system operator then dials the next number and presses Conference again; all participants, including the originator, are connected.

To add another person, the QCC system operator presses the Conference button again. The green LED next to the Call button flashes, indicating a call on hold, and the participants can converse. The originator can continue to add participants by dialing the number and pressing the Conference button until up to two outside lines and three extensions (including the conference originator) are added. The operator can converse privately with each participant before pressing the Conference button to join other participants.

Calls to busy numbers cannot be added to a conference. To disconnect a call to a busy number, the QCC system operator presses the Call button with the conference call. This disconnects the call to the busy number. The system operator can then continue adding participants.

All conference participants (a maximum of five) are connected together on one Call button. This allows the system operator to put the conference on hold and have other Call buttons available to make or receive other calls. However, since all participants are on one Call button, the system operator can drop only the last party added to the conference by pressing the Drop button and the Call button used to originate the conference.

To rejoin a held conference call, the QCC system operator presses the Call button with the conference participant. To end the conference, the QCC system operator joins the conference and presses the Forced Release button, and all participants are disconnected. If, instead of pressing the Forced Release button, the system operator hangs up, the conference is put on hold.

When a QCC system operator arranges a three-participant conference (the system operator and two other participants) and then presses the Release button or hangs up, the QCC system operator is released from the call and the other two participants remain connected. If the system operator arranges a three or four-participant conference, pressing the Release button has no effect however, if the system operator hangs up, the conference is disconnected.

All Other Multiline Telephones

A multiline telephone user arranges a conference call by pressing the Conference button after receiving a call or dialing the first outside number or extension. The green LED next to the button used to make the call flashes to indicate the person is on hold for the conference. An outside participant hears Music-On-Hold if it is programmed, and an inside participant hears nothing. The user then selects another line button, dials the next number, and presses Conference again. When the Conference button is pressed the second time, all participants (including the originator) are connected.

Conference **2-75**

To add another person, the user presses the Conference button again. The green LED next to the line buttons flash, but the participants can converse. The originator can continue to add participants by pressing the Conference button, selecting a line or dialing the number, and pressing the Conference button until up to two outside lines and three extensions (including the conference Originator) are in the conference. The user can converse privately with each participant before pressing the Conference button to join other participants.

Calls to busy numbers cannot be added to a conference. If the user reaches a busy number, he or she can press any of the line buttons associated with the conference call to disconnect the call to the busy number before continuing to add participants.

To selectively drop a participant the multiline telephone user presses the Drop button followed by the line button for the participant to be dropped. To leave the conference call temporarily without disconnecting the call, the user presses the Hold button. To rejoin a held conference call, the user presses any line button representing a conference participant. To end the conference, the user hangs up and all participants are disconnected.

Single-Line Telephones

A single-line telephone user sets up a conference call by pressing and releasing the Recall button or switchhook after receiving a call or dialing the first outside number or extension. The participant automatically goes on hold (an outside participant hears Music-on-Hold if it is programmed, and an inside participant hears nothing). The user then dials the other number and presses and releases the Recall button or switchhook again. All participants are connected on the conference call. A total of three participants can be included on a conference call originated from a single-line telephone. The user can converse privately with each participant before pressing the Conference button to join other participants.

Calls to busy numbers cannot be added to a conference. If the user reaches a busy number, the user can press and release the Recall button or switchhook to drop the outside line.

A single-line telephone user can drop the most recently added participant from the conference by pressing and releasing the Recall button or switchhook.

Note: If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC 3178-NHL and 2500MMGK-PEC 3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to add a conference participant or release the most recently added participant.

Mode Differences

Behind Switch

In the Behind Switch mode, the fixed Conference button on multiline telephones activates Conference from the host system. The dial codes for the host system for Conference and Drop must be system programmed. A multiline telephone user can program a Conference or Drop button to use the Conference feature as described above. A single-line telephone user cannot use the Conference feature in the Behind Switch mode.

Considerations

- ■ Transmission quality may vary during the conferencing of outside lines.

- ■ A call to a busy number cannot be added to a conference.

- ■ Pressing the Drop button and the line button for a participant also disconnects a participant who joined the conference by using a shared outside line or System Access button.

- ■ Conferences originated from multiline telephones can have a total of five participants-the originator plus two outside lines and two extensions.

- ■ Conferences originated from single-line telephones can have a total of three participants-the originator plus two others using any combination of inside or outside lines.

- ■ If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC 3178-NHL and 2500MMGK-PEC 3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to add a conference participant or drop the most recently added conference participant.

- ■ When a conference originator puts the conference on Hold, Music-on-Hold is not activated.

- ■ The system does not automatically select either an outside line or Intercom or System Access button when the user presses the Conference button; the user must select the line manually.

- ■ If the conference originator presses Conference, selects a line button, dials a number, and presses Conference again before the person being called answers, all conference participants hear ringback, which may cause voices to cut in and out.

- ■ If the conference originator calls a co-worker and presses the Conference button and the co-worker, while on hold for the conference, presses a Hold, Conference, or Transfer button, the call is disconnected.

- ■ If a conference participant (excluding the originator) who is included on a conference call on a System Access or intercom button leaves the conference temporarily by putting the call on hold and then rejoins the conference on a shared outside line or Shared System Access button, the person is connected to the conference. However, the original conference call appearance on the Intercom or System Access button is disconnected.

Feature Interactions

Account Code Entry   A separate account code must be entered for each outside call added to the conference.

Allowed Lists and Calling Restrictions

A user with an outward-restricted telephone cannot add an outside participant to a conference unless the participant's number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number to add a participant unless the participant's number is on an Allowed List assigned to the telephone.

However, if a conference originator with an outside caller presses the Conference button, selects an outside line, and presses Conference again before dialing a number, the outside caller can dial a toll call, thereby overriding calling restrictions assigned to the conference originator's telephone. The toll call is billed to the conference originator's company.

Auto Dial

The Conference button is pressed to enter the Flash special character in a telephone number programmed on an Auto Dial button. The Drop button is pressed to enter the Stop special character in a telephone number programmed on an Auto Dial button.

Barge-In

Barge-In can be used to interrupt conference calls; all participants hear the Barge-In tone. Barge-In, however, does not connect the user to a conference call if the conference already has the maximum number of participants. If Barge-In is used to oonnect to a conference call that involves an outside line/trunk and the person on the outside line/trunk hangs up, the person using Barge-In is also dropped.

Callback

A queued call cannot be part of a conference. With automatic Callback, the call is automatically queued; however. if the user tries to add the queued call to the conference, the system returns a busy tone. If a user with selective Callback tries to queue a call while setting up a conference, the system returns a busy tone. The user must press the Drop button and the line button with the queued call to drop the busy tone from the conference.

Calling Restrictions

A user with an outward-restricted telephone cannot add an outside participant to a conference unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot add a person at a toll number to a conference unless the number is on an Allowed List assigned to the telephone.

However, if a conference originator with an outside caller presses the Conference button, selects an outside line, and presses Conference again before dialing a number, the outside caller can dial a toll call, thereby overriding calling restrictions assigned to the conference originator's telephone. The toll call is billed to the conference originator's company.

Call Waiting

A Call Waiting tone is only heard by the person receiving the call and not by other conference participants. If the conference originator reaches a busy extension, hears the Call Waiting special ringback, and tries to add the call to the conference, the system returns a busy tone. The user must press the Drop button and then press the line button used to call the busy extension to drop the busy tone from the conference.

Coverage

Conference calls can be originated from a Cover button only when the user with a caller on the Cover button presses the Transfer button, dials the number for another person, and then presses Conference to complete the transfer. In this case only, instead of the call being transferred, a conference call with three participants (including the originator) is established.

Directory

The Extension, Personal, and System Directory features can be used to set up conference calls. The Conference button is pressed to enter the Flash special character in a directory listing telephone number. The Drop button is pressed to enter the Stop special character.

Disallowed Lists

A user cannot add outside people to a conference when the number is on a Disallowed List assigned to the telephone. However, if the conference originator with an outside caller presses the Conference button, selects an outside line, and presses Conference again before dialing a number, the outside caller can dial a toll call, thereby overriding calling restrictions assigned to the conference originator's telephone. The toll call is billed to the conference originator's company.

Display

As with any other call, the dialed digits appear on line 1 of the display as a user sets up a conference call. On MLX telephones, line 1 of the display shows the number of conference participants. In addition, the MLX telephone display prompts the user each time the Conference button is pressed (the prompt disappears when the user selects the line). The display also prompts the user to drop a conference participant after the Drop button is pressed and then shows the updated conference information on line 1 and which line or extension was dropped on line 2.

Forced Account Code Entry

A separate account code must be entered for each outside call added to the conference.

Forward and Follow Me

When calls received on a personal line are forwarded to an outside telephone number and another user who shares the personal line and the line/trunk selected to forward the call joins the in-progress call (by pressing the Personal Line button), the person joining the call is considered the conference originator and the forwarded call can be conference. If the person who joined the call hangs up, all participants on the conference call are disconnected.

Group Calling

Calls waiting in the calling group queue or ringing at a calling group member's station cannot be added to a conference call. A user must be connected to a calling group member before the call can be added to the conference

Headset Options

Headset Auto Answer is disabled and must be activated manually while an MLX telephone user with a headset is setting up a conference.

Hold	The conference originator receives the Hold Reminder tone when the conference is on hold for more than one minute as a result of using the Hold button or adding other participants. If DLC Operator Automatic Hold is programmed and used by a DLC system operator setting up a conference, the entire conference goes on hold.
	Both sides of an inside call cannot be put on hold. Therefore, if the user presses the Hold button while waiting on hold for a conference initiated by another user (an inside call), or if the user presses the Conference button while waiting on hold on an inside call, all participants are disconnected.
Inspect	If the user presses the Conference button while Inspect is activated, Inspect is canceled and the system tries to activate the Conference feature.
	When a user joins a conference by using a shared outside line or Shared System Access button, the queued call console (QCC) display reflects the correct number of participants. However, if the QCC system operator uses the Inspect feature to verify the number of participants, the number shown on the display does not include participants joining the conference on a shared button.
Multi-Function Module	The Conference feature cannot be used on the MFM since the system ignores the switchhook flash sent by the MFM.
Music-on-Hold	If the first participant put on hold for a conference is an outside call, the caller hears Music-on-Hold until the second participant is added.
Paging	Speakerphone and loudspeaker paging calls cannot be added to a conference.
Park	Conference calls can be parked by all users except a QCC system operator. They remain parked and do not return to the originating telephone if the Call Park Interval is exceeded. If a QCC system operator tries to park a conference by pressing the Start button and then pressing the DSS button for the Park zone, the park is denied and the system operator is reconnected to the conference.
Pickup	A conference call cannot be picked up at another telephone. A conference originator can, however, pick up a call and add it to the conference.
Queued Call Console	When a QCC system operator arranges a conference call, the result is that all conference participants (a maximum of five) are connected together on one Call button. This allows the system operator to put the conference on hold and still have other Call buttons to make and receive calls. However, since all participants are on one Call button, the system operator can drop only the last participant added to the conference.

Recall	A single-line telephone user with a Recall button adds a participant to a conference call and connects all participants by using the Recall button. In addition, the Recall button can be used to drop the most recently added participant or to drop a busy number.
Signaling	Signaling can be used during a conference.
Speed Dial	The Conference button is pressed to enter the Flash special character in a Personal Speed Dial or System Speed Dial telephone number. The Drop button is pressed to enter the Stop special character.
Station Message Detail Recording	When a conference call includes inside and outside participants, records are generated only for outside participants. When a call is dropped from a conference call, it is considered a completed call and is sent to the SMDR print queue.
System Access	Calls on Intercom or System Acoess buttons (including Shared System Access buttons) can be included in a conference call in the Hybrid/PBX mode, if a user involved in a conference call on a System Access button also has a Shared System Access button for one of the conference participants, the call is active at the System Access button and not at the Shared System Access button for the other participant.
Transfer	A conference call with three or more participants (including the conference originator) cannot be transferred. However, if the conference originator has one person on hold for the conference (the originator pressed the Conference button after reaching the first person) and after dialing the number for the next participant decides to transfer the call, he or she can press the Transfer button to transfer the call instead of conferencing it.

System Programming

■ Assign the host system Conference dial code.

Options -> More -> BhndSwitch -> Conference

■ Assign the host system Drop dial code.

Options -> More -> BhndSwitch -> Drop

Related Features

■ Hold

Coverage

Extension Programming

Sender Buttons:

Programming Code:
  Coverage for both inside
  and outside calls: *48
  Coverage for outside
  calls only: **48
  Coverage On/Off: *49

MLX Display Label:
  Coverage for both inside
  and outside calls: CoverInside, On [CvIns, On]
  Coverage for outside
  calls only: CoverInside, Off [CvIns, Off]
  Coverage On/off: CoverageOff [CvOff]

Receiver Buttons:

Programming Code:
  Primary Individual Coverage: *40 + sender's
                                       extension number
  Secondary Individual; Coverage: *41 + sender's
                                       extension number
  Group Coverage   *42 + sender group number

MLX Display Label:
  Primary Individual Coverage,   Coverage, Primary
                                   [Cover, Prmry]
  Secondary Individual Coverage: Coverage, Secondary
                                   [Cover, Secnd]
  Group Coverage: Coverage, Group [Cover, Group]

Description

Coverage allows calls received by users (called "senders") to be answered by "recievers." A Coverage sender can be any type of telephone except a queued call console (QCC). A Coverage receiver can be one or more co-workers, the QCC queue (Hybrid/PBX only), or a calling group. A receiver can answer calls for a sender even when the receiver does not share outside lines/trunks or System Access buttons (Hybrid/PBX only) with the sender.

The two types of Coverage are Individual Coverage and Group Coverage. Both are described in this section.

■ Calls received at Intercom or System Access buttons programmed for Immediate or Delayed Ring—inside calls, calls received on a Direct Inward Dial trunk (Hybrid/PBX only), or outside or inside calls transferred by another user.

■ Calls received on Pool buttons programmed for Immediate or Delayed Ring.

■ Calls received on personal lines (outside lines assigned to buttons on the telephone) programmed for immediate or Delayed Ring when the sender is assigned via system programming as the principal user for the personal line, or when no principal user is assigned for the personal line.

See "Forward and Follow Me" in this chapter for details on types of lines/trunks on which calls can be forwarded to outside numbers.

Note: When a sender with Remote Fowarding capability is assigned as the principal user of a personal line, calls received on the personal line can be forwarded to an outside number. Only one extension can be the principal user for each individual line/trunk. If no principal user is assigned and the personal line is shared by other senders, calls received on the personal line are sent to all available primary or secondary Individual Coverage receivers for all senders sharing the line. If more than one sender also has Group Coverage Receivers programmed, the calls are sent only to the Group Coverage receiver for the sender connected to the station jack with the lowest numbered logical ID.

The following types of calls are not eligible for Coverage:

■ Calls received on buttons programmed for no ring

■ Calls received on Personal Line buttons on other than the principal user's telephone

■ Calls received on an Intercom or System Access button that are forwarded from another extension

An eligible call is sent to the Coverage receiver(s) as soon as the sender's telephone rings. An eligible call received on a button that is programmed for Immediate Ring on the sender's telephone is sent to the Coverage receiver(s) immediately. An eligible call received on a button programmed for Delayed Ring on the sender's telephone is sent to the Coverage receiver(s) after the call rings two times at another telephone sharing the line.

A sender can use Coverage On/Off to activate and deactivate Coverage so that calls are sent to receivers only when the sender chooses. With Coverage On/Off off, calls are not sent to Coverage receivers. The sender can also program the telephone to have all calls or only outside calls sent to receivers.

Individual Coverage

Individual Coverage is a one-on-one arrangement where calls received by one sender are sent to an individual Cover button programmed on a receiver's telephone. Each individual Cover button programmed on a receiver's telephone corresponds to only one sender. A maximum of eight Coverage receivers can program an individual Cover button for each sender.

A sender can have any type of telephone except a QCC. Only a multiline telephone can be a receiver a single-line telephone and a QCC cannot be a receiver.

The sender's telephone can be programmed to have all calls or just outside calls covered. A receiver can program separate Individual Cover buttons for more than one sender (a maximum of eight).

Each receiver can program each Individual Cover button for Immediate Ring, Delayed Ring, or No Ring. If a receiver programs an Individual Cover button for Delayed Ring, the Delayed Ring Interval determines when the receiver's telephone rings. The Delayed Ring Interval for the system can be set to 1-6 rings (the factory setting is two rings) via system programming.

Each Individual Cover button can be programmed to provide primary or secondary Individual Coverage.

■ **Primary Individual Coverage.** A receiver with a multiline telephone can program a Primary Cover button for the sender's extension number.

When the sender's telephone rings with an eligible call, the call is sent immediately to all receivers with a programmed Primary Cover button for the sender. For each possible ringing option the status of the green LED and when the receiver's telephone rings are as follows:

■ Immediate Ring. The green LED next to the Primary Cover button flashes immediately, and the receiver's telephone rings immediately.

■ Delayed Ring. The green LED next to the Primary Cover button flashes immediately, and the receiver's telephone rings after the programmed Delayed Ring interval (1-6 rings).

■ No Ring. The green LED next to the Primary Cover button flashes immediately, but the receiver's telephone does not ring.

Primary Individual Coverage is useful for executives whose calls are screened by a secretary or for direct-line console (DLC) system operators who cover calls for another system operator during peak calling periods or while the other system operator is away from the office.

■ **Secondary Individual Coverage.** A receiver with a multiline telephone can program a Secondary Cover button for the sender's extension number.

When the sender's telephone rings with an eligible call, the call is sent immediately to all receivers with a programmed Secondary Cover button for the sender. For each possible ringing option the status of the green LED and when the receiver's telephone rings areas follows:

■ Immediate Ring. The green LED next to the Secondary Cover button flashes immediately, and the receiver's telephone rings after the sender's telephone rings two times (the Secondary Delay Interval cannot be changed).

■ Delayed Ring. The green LED next to the Secondary Cover button flashes immediately, and the receiver's telephone rings after the sender's telephone rings two times (the Secondary Delay Interval) plus the programmed Delayed Ring Interval (1-6 rings). For example, if the Delayed Ring Interval is set to two rings, the receiver's telephone rings after the sender's telephone rings four times.

■ No Ring. The green LED next to the Secondary Cover button flashes immediately, but the receiver's telephone does not ring.

Secondary Individual Coverage is useful for executives who want calls covered only when they are unable to answer or for DLC system operators who want a co-worker to provide backup during peak calling periods.

Both Primary Cover and Secondary Cover buttons can be programmed for each individual sender (a maximum of eight).

Calls ringing on Primary Cover and/or Secondary Cover buttons ring until answered. When the call is answered, the call appearance is removed from all telephones involved in the coverage arrangement.

The factory setting covers both inside and outside calls. The sender can program the telephone to have only outside calls covered. A sender can also program a Coverage On/Off button to allow or prevent calls from going to receivers.

Figure 2-2 shows examples of the LED and ringing patterns when both Primary Cover and Secondary Cover buttons are programmed for an individual sender.
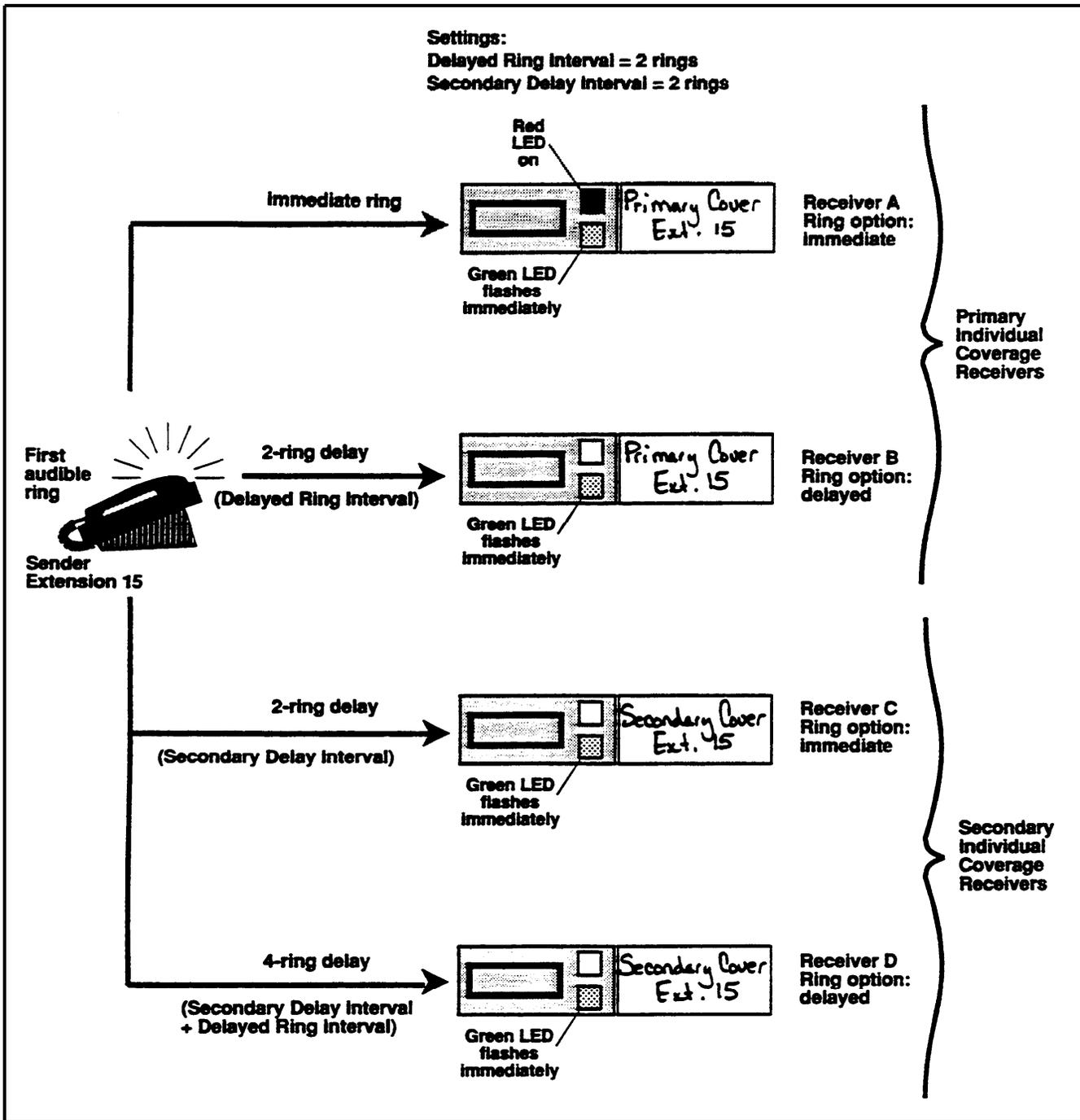
Figure 2-2 Primary and Secondary Individual Coverage Ringing Patterns

Group Coverage

Group Coverage is a group arrangement where senders are organized into groups and calls received by any member of the group are sent to one or more receivers. Any telephone (except a QCC) can be a member of a coverage group; however, each sender can be a member of only one coverage group.

Senders are assigned to a coverage group via system programming. A maximum of 30 coverage groups can be programmed; there is no limit to the number of senders allowed in each coverage group.

Three types of Group Coverage receivers can be assigned:

■ **Calling group.** A calling group can be assigned via system programming as a receiver for 1-30 coverage groups. If a calling group is programmed as a receiver for a coverage group, it can be the only receiver and no other types of Group Coverage receivers can be programmed.

When a calling group is programmed as a receiver for a coverage group, the call enters the calling group queue and waits for an available calling group member. When the call rings at an available member's telephone, the call appearance is removed immediately from the sender's telephone.

■ **Multiline Telephone.** A receiver with a multiline telephone can program a Group Cover button associated with the Coverage Group number (01-30). A maximum of eight Group Cover buttons can be programmed for each coverage group. All eight can be programmed on one multiline telephone or they can be distributed among up to eight multiline telephones.

A receiver can program one to eight Group Cover buttons for a single coverage group: however, each programmed button is counted in the eight Group Cover button maximum.

Each receiver can program each Group Cover button for Immediate Ring, Delayed Ring, or No Ring. When a Group Cover button is programmed for Delayed Ring, the receiver's telephone rings after the number of rings programmed for the Delayed Ring Interval (1-6; the factory setting is two rings).

Group Cover buttons cannot be programmed on QCCs. Single-line telephones cannot be programmed individually as Group Coverage receivers. However, if a single-line telephone is a member of a calling group, it can receive group coverage calls.

■ **QCC queue (Hybrid/PBX only).** The QCC queue can be programmed via system programming as a receiver for 1-30 coverage groups by assigning one to four QCC system operators to receive calls for each coverage group. The QCC queue can be the only receiver or can be programmed in addition to Group Cover buttons on multiline telephones; it is not counted in the eight-receiver maximum.

Note: When Group Coverage is the only type of coverage programmed for a sender, it is not recommended that the QCC queue be programmed in addition to Group Cover buttons because coverage calls received by a QCC system operator cannot be programmed for Delayed Ring. Therefore, eligible calls ring immediately both at the sender's telephone and at the QCC queue. This may not allow the sender enough time to answer the call before a QCC system operator receives the call.

When the QCC queue is a receiver, Group Coverage calls enter the queue and are delivered to an available QCC system operator in the same way that other calls are.

Group Call Coverage can be used alone with either primary or secondary Individual Coverage, or with both. This allows callers to get personal attention from the primary and/or secondary Individual Coverage receiver; Group Coverage is used only as backup.

For example, one or more receivers (such as secretaries or assistants) can program Primary Cover and/or Secondary Cover buttons to provide Individual Coverage for all incoming calls for a sender who is a member of a coverage group.

The factory setting for the type of calls covered for a coverage group member is both inside and outside calls. Each coverage group member can program the telephone to have only outside calls covered. A sender can also program a Coverage On/Off button to allow or prevent calls from being sent to receivers.

A call to a sender that is also ringing on Primary Cover, Secondary Cover and/or Group Cover buttons, rings until answered. When the call is answered, the call appearance is removed from all other telephones involved in the coverage arrangement. However, when a calling group is programmed as the receiver for a coverage group, the call appearance is removed from the sender's telephone when the call leaves the calling group queue and is sent to an available calling group member (except for outside calls received on a Personal Line).

Whether or not a call is sent to Group Coverage depends on:

■ Whether the sender is available or unavailable.

■ Whether or not Primary Cover and/or Secondary Cover buttons are programmed, and whether a primary and/or secondary Individual Coverage receiver is available or unavailable.

■ The type of Group Coverage receiver(s) programmed-calling group, QCC queue, or Group Cover buttons.

■ The Coverage Delay Interval, which is the number of rings (1-9; the factory setting is 3) before a call is sent to a calling group, QCC queue, or other Group Coverage receivers when Primary Cover and/or Secondary Cover buttons are also programmed for the sender. The Coverage Delay Interval is set system wide via system programming.

■ The Delay Ring Interval (1-6 rings; the factory setting is 2), which is the number of rings before a call is received on any type of Cover button programmed with delayed ring.

Note: The duration of the ring heard by an outside caller is shorter than the ring heard at an MLX or analog multiline telephone. Therefore, an outside caller hears one or two rings plus the number of rings programmed for the Delayed Ring Interval and Coverage Delay Interval. For example, if the Delayed Ring Interval is programmed for two rings and the Coverage Delay interval is programmed for one ring, an outside caller hears four rings before the call is sent to coverage. If both intervals are set to their maximum values, the caller can hear up to two additional rings.

A sender is considered unavailable when:

■ The sender activates Do Not Disturb

■ The sender's telephone is in extension or system programming mode

■ All intercom or System Access buttons are being used on the sender's telephone

■ The sender does not answer

■ The sender with an MLX display telephone is using the Alarm Clock or Directory feature

■ The sender's telephone is busied-out for maintenance or system programming

A primary or secondary Individual Coverage receiver is considered unavailable to receive calls when:

■ The receiver activates Do Not Disturb

■ Another call is ringing or answered on a Primary Cover, Secondary Cover, or Group Cover button

■ A Primary Cover or Secondary Cover button is not programmed for a sender

When a call is sent to group coverage depends on the type of receivers programmed for a coverage group.

If a call is sent to Group Coverage and no Group Coverage receiver is available, the system tries to send the call to Group Coverage every five seconds until the call is answered by the sender or until an Individual Coverage receiver or a Group Coverage receiver becomes available. This is called retry timing; the interval cannot be adjusted.

Table 2-3 shows when the call is sent to Group Coverage receivers. For multiline telephone receivers, when the telephone rings depends on the ringing option (Immediate Ring, Delayed Ring, or No Ring) chosen for the Group Cover button. See Figures 2-3 and 2-4 for examples of LED and ringing patterns.

Figure 2-3 shows examples of the LED and ringing patterns when only Group Coverage is used or when all individual Coverage receivers are unavailable.

Figure 2-4 shows examples of the LED and ringing patterns when both Individual Coverage (primary and secondary) and Group Coverage is programmed for an individual sender.

Table 2-3 Group Coverage Call Delivery Rules

Receiver Type	Sender Status	Primary/ Secondary Receiver Status	When Call is Delivered to Group Coverage
Multiline telephone only or multiline telephone and QCC queue	Available	Available	After Coverage Delay Interval (1-9 rings) + Delayed Ring Internal (2-6 rings)
	Available	Unavailable or not programmed	Immediately
	Unavailable	Available	After Coverage Delay Interval (1-9 rings) + Delayed Ring Interval (2-6 rings)
	Unavailable	Unavailable or not programmed	Immediately
QCC queue only	Available	Available	After Coverage Delay Interval (1-9 rings) + Delayed Ring Interval (2-6 rings)
	Available	Unavailable or not programmed	After Coverage Delay Interval (1-9 rings)
	Unavailable	Available	After Coverage Delay Interval (1-9 rings) + Delayed Ring Interval (2-6 rings)
	Unavailable	Unavailable or not programmed	Immediately

Table 2-3 Continued

Receiver Type	Sender Status	Primary/ Secondary Receiver Status	When Call is Delivedred to Group Coverage
Calling group	Available	Available	After Coverage Delay Interval (1-9 rings)+ Delayed Ring Interval (2-6 rings)
	Available	Unavailable or not programmed	After Coverage Delay Interval (1-9 rings)
	Unavailable	Available	After Coverage Delay Interval (1-9 rings) + Delayed Ring Interval (2-6 rings)
	Unavailable	Unavailable or not programmed	Immediately

Settings:
Delayed Ring Interval = 2 rings
Coverage Delay Interval = 3 rings
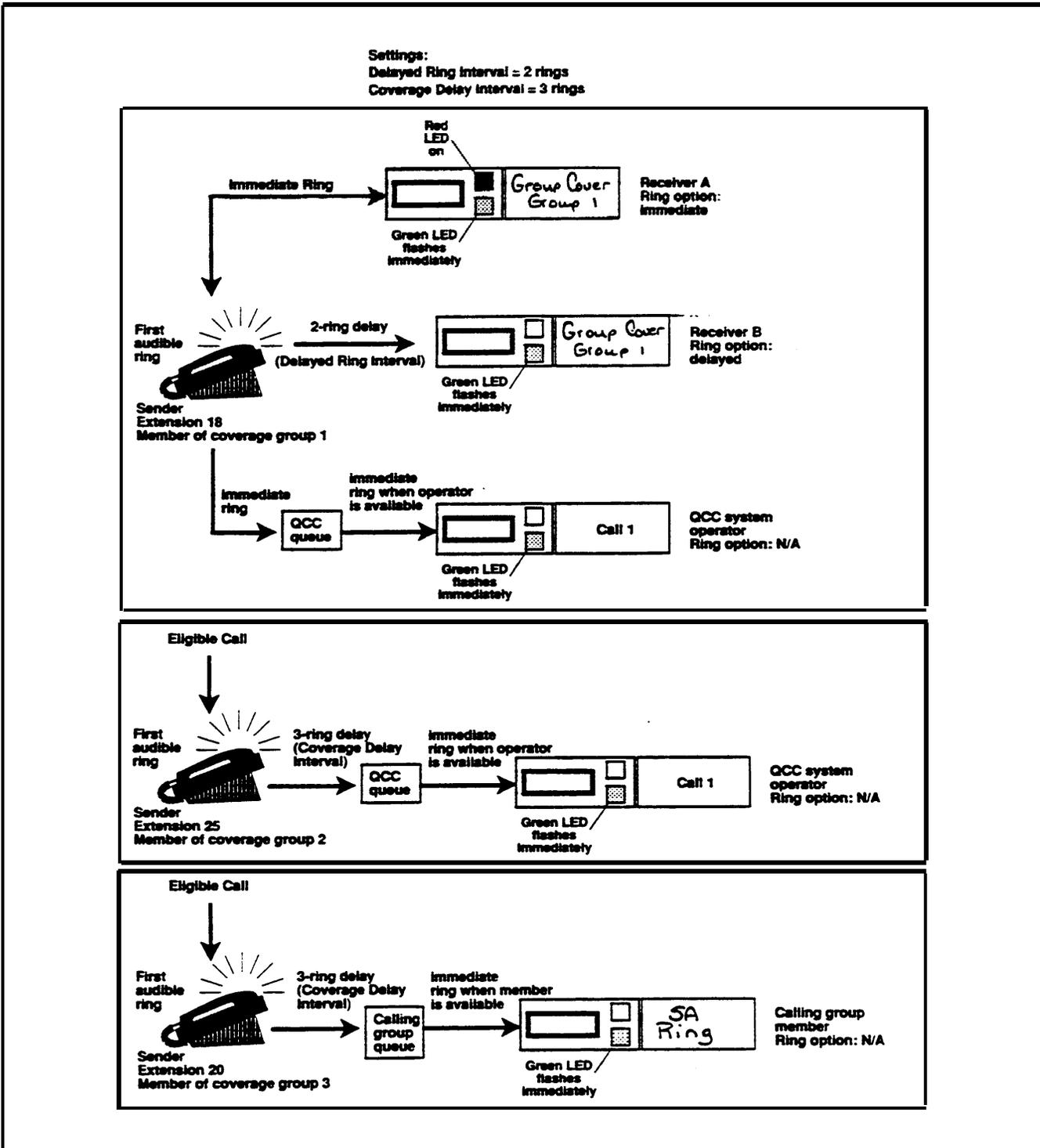
Figure 2-3 Group Coverage Only or All Individual Coverage Receivers Not Available
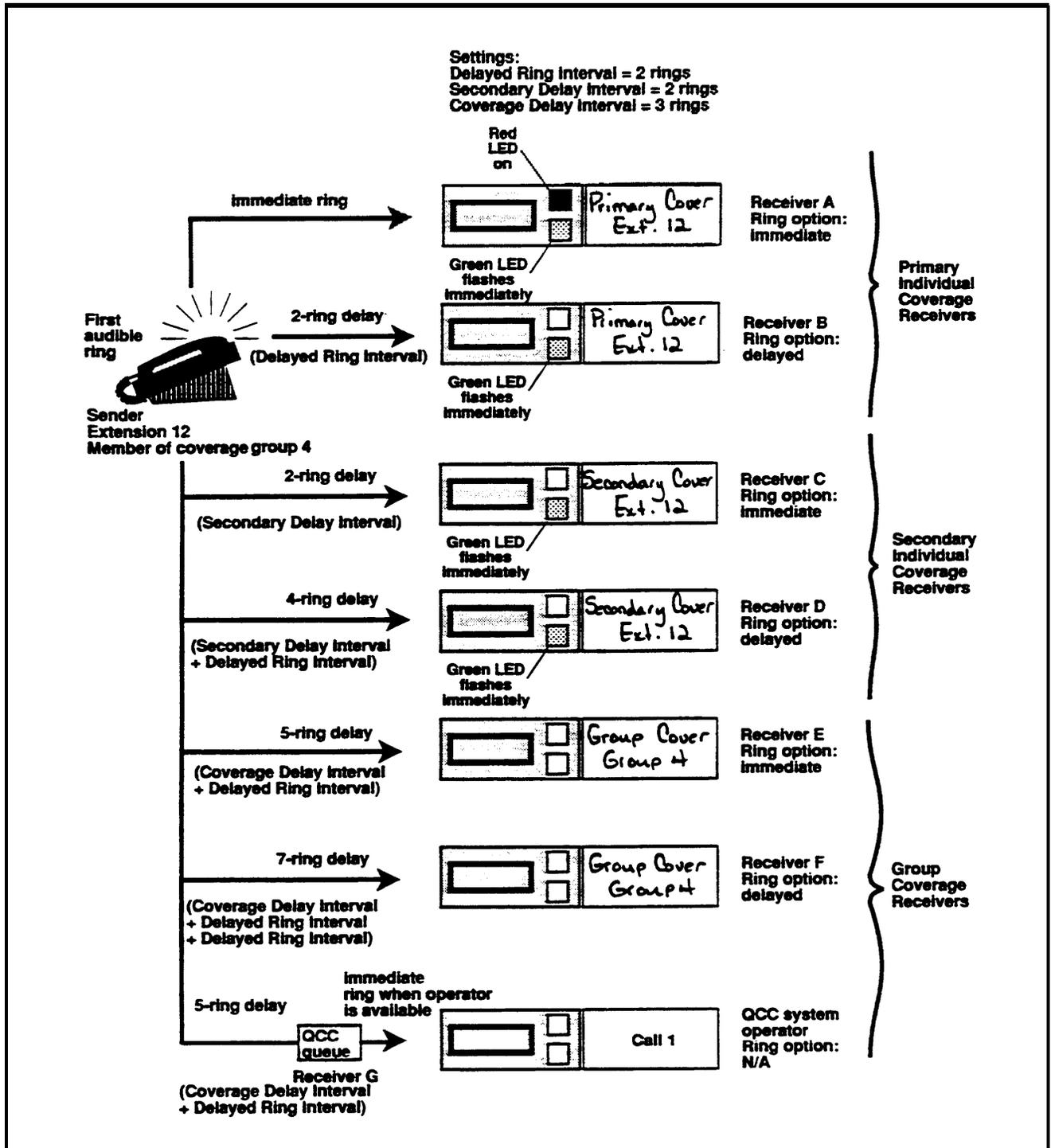
Figure 2-4 Individual (Primary and Secondary), and Group Coverage Ringing Patterns

Telephone Differences

Multiline Telephones Any type of multiline telephone except a QCC can be a sender and/or receiver for either Individual Coverage or Group Coverage.

Single-Line Telephones A single-line telephone can be a sender. A single-line telephone cannot be a receiver for Individual Coverage and can be a receiver for Group Coverage only when the single-line telephone is assigned as a member of a calling group.

Mode Differences

Hybrid/PBX The queued call console (QCC) queue can be a Group Coverage receiver and is not counted in the maximum of eight receivers allowed for each group.

Key and Behind Switch The QCC queue is not available in the Key and Behind Switch mode.

Considerations

- A maximum of eight Individual Coverage receivers (primary or secondary) can be assigned for an individual sender.
- A maximum of 30 coverage groups can be assigned.
- The factory setting for type of calls covered for a sender is both inside and outside calls.
- Each coverage group can have from no members to the maximum number of telephones in the system.
- Each sender can be a member of only one coverage group.
- A receiver with a multiline telephone can program one to eight Group Cover buttons for an individual coverage group; however, each programmed button is counted in the eight Group Cover button maximum.
- A maximum of eight Group Cover buttons can be assigned for each coverage group. All eight can be programmed on one multiline telephone, or the Group Cover buttons can be distributed among up to eight multiline telephones.
- A receiver with a multiline telephone can provide coverage for a maximum of eight coverage groups and/or individual senders.
- When the QCC queue is programmed as a Group Coverage receiver along with multiline telephones, the queue is not counted in the eight-receiver maximum for each group. The QCC queue can provide Group Coverage for 1-30 coverage groups.

■ When Group Coverage is the only type of coverage programmed for a sender, the QCC queue should not be programmed in addition to Group Cover buttons because coverage calls received by a QCC system operator cannot be programmed for Delayed Ring. Therefore, eligible calls ring immediately both at the sender's telephone and at the QCC queue. This may not allow the sender enough time to answer the call before a QCC system operator receives the call.

■ A maximum of one calling group can be assigned as a receiver for each coverage group.

■ If a calling group is programmed as a receiver for a coverage group, it is the only Group Coverage receiver and no other types of Group Coverage receivers can be programmed. However, Individual Coverage (primary and secondary) can also be programmed.

■ A calling group can be a receiver for 1-30 coverage groups.

■ When a sender is assigned to a coverage group and no receivers are assigned for the group, if the sender is unavailable, the caller hears ringback and not a busy tone.

■ Primary Cover, Secondary Cover, and Group Cover buttons cannot be used to make calls.

■ A Group Coverage receiver can program a Group Cover button and can also be a member of the coverage group for which the button is programmed. Calls for the receiver are sent to all receivers programmed for the group.

■ Only one extension can be assigned as the principal user for each individual line/trunk assigned as a personal line.

■ If a call is sent to coverage because the sender did not have available buttons to take the call, the call does not return to the sender's telephone, even if a button becomes available while the call is ringing at a coverage receiver's telephone.

■ The factory setting for the Coverage Delay Interval is three rings. The setting can be programmed for 1-9 rings.

■ The Coverage Delay Interval does not appear on system programming reports.

■ The Secondary Delay (the delay before a call is eligible to ring at a Secondary Cover button) is fixed at two rings.

■ The duration of the ring heard by an outside caller is shorter than the ring heard at an MLX or analog multiline telephone. Therefore, an outside caller hears one or two rings plus the number of rings programmed for the Delayed Ring Interval and Coverage Delay Interval. For example, if the Delayed Ring Interval is programmed for two rings and the Coverage Delay Interval is programmed for one ring, an outside caller hears four rings before the call is sent to coverage. If both intervals are set to their maximum values, the caller can hear up to two additional rings.

■ If a receiver has both a Primary (or Secondary) Cover button for a sender and a Group Cover button for the group in which the sender is a member, a call rings only at the Primary (or Secondary) Cover button. This prevents multiple calls to the same receiver.

- If a sender calls a receiver, the call follows any individual or Group Coverage pattern programmed for the receiver. However, if a receiver calls an unavailable sender, the call is sent to an individual or Group Coverage receiver programmed for the sender. If the sender is available, the call is not sent to individual or Group Coverage receivers.

- Inside voice-announced calls made by using either an Intercom Voice or System Access Voice button that are subsequently sent to coverage are not voice announced but ring at the receiver's telephone instead.

Feature Interactions

Account Code Entry

When answering calls on a Primary Cover, Secondary Cover, or Group Cover button, a receiver cannot enter an account code. The account code must be entered from the sender's telephone. (If the receiver tries to enter an account code, no error tone sounds and the account code does not appear on the SMDR printout.)

Since Cover buttons are not required when the QCC queue is programmed as a receiver for a Coverage group, a QCC system operator can enter account codes and the account code appears on the SMDR printout.

Auto Answer All

Auto Answer All is used when a receiver with an analog multiline telephone wants Individual or Group Coverage calls answered by an answering machine connected to the telephone.

Auto Answer Intercom

Auto Answer Intercom does not allow a receiver with an analog multiline telephone to use a Hands-Free Unit to answer calls received on a Primary Cover, Secondary Cover, or Group Cover button.

Automatic Line Selection

Primary Cover, Secondary Cover, and Group Cover buttons cannot be programmed in an Automatic Line Selection sequence since the buttons cannot be used to make calls.

Barge-In

Barge-In can be used for Individual or Group Coverage calls answered at any receiver telephone.

Callback

The sender and all coverage receivers must be busy before a call to a sender can be queued. The call is sent to coverage before it is put in the Callback queue. Once a call is in the Callback queue, it is not sent to coverage again. The Callback call indicating that a busy extension or pool is available is not eligible for Individual or Group Coverage.

Call Waiting A call to a sender with Call Waiting activated goes to Individual and/or Group Coverage first. If all coverage areas are busy, the sender receives the Call Waiting tone.

On a sender uses Coverage On/Off to prevent calls from going to Coverage receivers after hearing a Call Waiting tone, the waiting call does not go to Coverage, but subsequent calls do.

Camp-On All Individual and/or Group Coverage points must be busy before a call can be camped on to a sender's telephone. Coverage calls answered by any receiver can be camped onto another user.

Conference Conference calls can be originated from a Cover button only when the user with a caller on the Cover button presses the Transfer button, dials the number for another person, and then presses Conference to complete the transfer. In this case only, instead of the call being transferred, a conference call with three participants (including the originator) is established.

Direct-Line Console A DLC can be both an Individual or Group Coverage receiver and a member of a coverage group. No more than eight Primary Cover, Secondary Cover, or Group Cover buttons can be assigned on a DLC.

Direct Station Selector When a system operator transfers an Indvidual or Group Coverage call and the call returns, the red LED next to the DSS button for the sender does not flash as it does for a transfer return for calls received on other types of line buttons.

Display When an Individual or Group Coverage call is answered by a receiver with a display telephone, "Cover" is shown for the call type followed by the sender's name (if programmed) or extension number, and the reason the call was sent to coverage: "No answer," "Busy," or "Do Not Disturb active."

On an MLX telephone, other reasons why calls are sent to coverage are also shown: "Invalid/unknown DID number" or "Invalid/unknown Remote Access number," and the caller's information is shown on the second page of the Home screen.

Do Not Disturb When a sender activates Do Not Disturb, calls go to Individual and/or Group Coverage receivers. Individual and/or Group Coverage calls are not sent to a receiver with Do Not Disturb activated. If both a sender and all receivers have Do Not Disturb activated, the call is not sent to Coverage and the caller hears a busy tone.

If a sender in a coverage group activates Do Not Disturb and one of the coverage group receivers calls the sender, the call rings on the sender's telephone.

Forward and Follow Me	When a sender forwards calls, the calls go to Coverage at the same time. Calls received on a Primary Cover, Secondary Cover, or Group Cover button cannot be forwarded.
Group Calling	A calling group cannot be programmed as a receiver for Individual Coverage. A coverage group can have only one calling group as a receiver. If a calling group is programmed as a receiver for a coverage group, it can be the only Group Coverage receiver; Individual Coverage (primary and/or secondary) receivers can be programmed. A calling group can be a receiver for 1-30 coverage groups.

As soon as the call is sent from the calling group queue to a calling group member, the call appearance is removed-from the sender's telephone (except for outside calls received on personal lines).

A calling group member can be a sender for Individual Coverage (primary or secondary) or Group Coverage. Calls to the calling group extension number are sent only to the calling group members Individual Coverage receivers and not to the Group Coverage receivers. Calls to the calling group member's individual extension are sent to both Individual and Group Coverage receivers.

Hold	Coverage calls answered by any type of receiver can be put on hold. The Hold Reminder applies to any calls put on hold on a Primary Cover, Secondary Cover, or Group Cover button.
Multi-Function Module	An MFM can be a sender or a receiver for Individual or Group Coverage. This allows the associated MLX telephone user to screen calls by using an answering machine connected to the MFM or to supplement ringing by using an external alert connected to the MFM. A sender can use Coverage On/Off to prevent calls from being sent to an answering machine.
Park	A returning parked call is not eligible for Coverage. A call answered on a Primary Cover, Secondary Cover, or Group Cover button can be parked on that button.
Personal Lines	Assigning a sender as the principal user of a personal line specifies that the calls received on the personal line are sent to the principal user's Individual and Group receivers. A principal user with Remote Call Forwarding can forward calls received on the personal line to an outside number.

Calls received on Personal Line buttons programmed for no ring or on senders' telephones other than the principal user are not eligible for Coverage.

Only one extension can be assigned as the principal user for each individual line/trunk. If no principal user is assigned and the personal line is shared by other senders, calls received on the personal line are sent to all available Individual Coverage receivers for all senders sharing the line and to the Group Coverage receivers programmed for the sender with the lowest logical ID.

Once a receiver answers a call received on a personal line on a Cover button and puts the call on hold, the sender and any other user who shares the personal line cannot pickup the call by pressing the Personal line button. For proper handling, the receiver should transfer the call to the sender.

Pickup

An Individual or Group Coverage sender or receiver can be a member of a pickup group. This allows Pickup to be used to answer a ringing Individual or Group Coverage call. If a sender who is a member of a Pickup group uses Coverage On/Off to prevent calls from being sent to individual or Group Coverage receivers, his or her calls can be picked up by using the Individual Pickup feature. However, calls cannot be picked up by using the Group Pickup feature. When a Coverage call is answered by using Pickup, the call appearance is removed from all other telephones in the Coverage arrangement.

Pools

Calls received on a sender's pool button programmed for immediate or delayed ring are eligible for Individual or Group Coverage.

Queued Call Console

An individual QCC cannot be a sender or receiver for Individual or Group Coverage, but the QCC queue can be assigned as a receiver for 1-30 coverage groups by assigning one or more QCC system operators to receive the calls. The QCC queue can be assigned as a receiver in addition to multiline telephones programmed with Group Cover buttons; however, the QCC queue is not counted in the eight-receiver maximum for each coverage group. The QCC queue priority and the individual system operator that receive calls for each coverage group are independently assigned for each group.

When the QCC queue is programmed as a receiver for a coverage group and a personal line on a coverage group member's telephone is also programmed to ring into the QCC queue, calls received on that personal line are not sent to the QCC queue as coverage calls. However, calls received on the personal line can be sent to multiline telephone Group Coverage receivers.

If Group Cover buttons are programmed for a coverage group in addition to the QCC queue and all QCC system operators are in Position Busy mode, a Group Coverage call does not go to a backup calling group.

When the QCC queue is programmed as a receiver for a coverage group and a call transferred to a group member is not answered, the call is returned to the queue as a transfer return if the QCC Return Ring Interval is shorter than the Coverage Delay Interval. If the QCC Return Ring Interval is longer than the Coverage Delay Interval, the call returns to the QCC queue as a Group Coverage call.

Reminder Service

Reminder Service calls are not eligible for Individual or Group Coverage.

Ringing Options

Primary Cover, Secondary Cover, and Group Cover buttons can be programmed for Immediate Ring, Delayed Ring, or No Ring. If an Individual or Group Coverage receiver is on a call when a coverage call is received, the receiver hears an abbreviated ring (if Abbreviated Ring is enabled). Calls received on a Primary Cover, Secondary Cover, or Group Cover button ring with the receiver's (not the sender's) personalized ringing pattern.

Station Message Detail Recording

The extension of the telephone on which an Individual or Group Coverage call is answered is shown on the SMDR report.

System Access

When a Primary Cover, Secondary Cover, or Group Cover button is programmed, a call received on an Intercom or System Access button that is eligible for Individual or Group Coverage remains on the sender's Intercom or System Access button until it is answered at the receiver's telephone. However, in the Hybrid/PBX mode, calls received on Shared System Access buttons are not eligible for Individual or Group Coverage.

Once answered by a receiver, the call is removed from the sender's Intercom or System Access button (including all Shared System Access buttons). However, when a calling group is programmed as a Group Coverage receiver, the call is removed from the sender's telephone as soon as it is sent from the calling group queue to an available member.

In the Hybrid/PBX mode, if a receiver programs a Primary Cover, Secondary Cover, or Group Cover button for a sender and also has a Shared System Access button associated with the sender, the green LED next to both the Cover button and Shared System Access button flashes. The red LED stays on at the Shared System Access button it does not automatically go on next to the Cover button.

Transfer

Calls transferred to a sender are eligible for Individual and/or Group Coverage. However, the sender hears a Call Waiting tone if the sender is using Coverage On/Off to prevent calls from going to coverage and does not have an available Intercom or System Access button to receive a transferred call, even if an Individual or Group Coverage receiver is available.

A call answered on a Primary Cover, Secondary Cover, or Group Cover button can be transferred. When One-Touch Transfer is programmed, the call can be transferred by using DSS buttons. Transfer returns are not eligible for Individual or Group Coverage.

System Programming

■ Assign extensions to Group Coverage sender groups.

Extension -> More -> Group Cover

■ Assign calling group as a Group Coverage receiver.

Extension -> More -> Grp Calling -> Coverage

■ Assign or remove principal user of a personal line. This specifies that calls received on the personal line follow only the individual extension's Coverage patterns and not the Coverage patterns of other users who share the line. In addition, if Remote Call Forward is assigned, calls received on the personal line can be forwarded to outside telephone numbers.

LinesTrunks -> More -> PrncipalUsr

■ Change the number of rings programmed for the Delayed Ring Interval (1-6 rings; the factory setting is 2 rings).

Options -> Delay Ring

■ Change the number of rings programmed for the Coverage Ring Interval (1-9 rings; the factory setting is 3 rings).

Options -> More -> Cover Delay

Related Features

■ Group Pickup

■ Ringing Options

Direct-Line Console

Description

The direct-line console (DLC) is an answering position used by system operators to:

■ Answer outside calls that are not directed to an individual user or group

■ Answer inside calls

■ Transfer inside and outside calls to an extension or an outside telephone number

■ Make outside calls-for example, for users with telephones restricted from making outside calls

■ Set up conference calls

■ Monitor system operation

■ Monitor group member or room status when used with Extension Status in the group calling CMS or hotel mode

A DLC operates like other multiline telephones. In all three modes of operation, outside lines are assigned as personal lines to individual buttons on the console. The lines assigned on an individual DLC can also be assigned to buttons on other consoles or other telephones. Incoming calls can ring on any of the line buttons, and several calls can ring simultaneously. The system operator directs calls to other users via the Transfer button.

See the individual feature descriptions for information on Alarm, Night Service, Reminder Service, and Messaging.

A multiline telephone assigned as a DLC through system programming can use both system operator features and telephone features available for non-operator multiline telephones to increase call-handling efficiency. The system operator features that can be assigned to buttons on the console are Alarm, Night Service, Missed Reminder, and Send/Remove Message.

On a system with fewer than 29 lines, Alarm, Night Service, and Send/Remove Message are factory assigned to analog DLCs with 34 buttons or more. On a system with more than 29 lines, Alarm is replaced with line 30, Night Service is replaced with line 31, and Send/Remove Message is replaced with line 32. Alarm, Night Service, and Send/Remove Message and the first 1-18 lines are factory assigned on an MLX-28D used as a DLC, regardless of the number of lines/trunks connected to the system.

See Chapter 5 for a complete hardware description of telephones that can be used as DLCs.

The following telephones can be used as DLCs:

■ **Analog DLC**

   ■ BIS-22D

   ■ BIS-34

   ■ BIS-34D

   ■ MERLIN II System Display Console

■ **Digital DLC**

   ■ MLX-28D

   ■ MLX-20L

See "Direct Station Selector" in this chapter for detailed information on the DSS.

Each digital DLC can have one or two Direct Station Selector (DSS) adjuncts attached. The DSS cannot be attached to an analog DLC; however, the MERLIN II System Display Console provides a built-in DSS.

Inside Auto Dial buttons can also be programmed on DLCs. The system operator can use these buttons to transfer a call, make an internal call, or determine whether or not an extension is available.

Telephone Differences

Digital DLC

An MLX-20L assigned as a DLC can also be used for system programming by connecting it to the first or fifth station jack on the first MLX module and designating the station jack for system programming.

The Home screen of the MLX-20L and MLX-28D is the same as that of non-operator telephones.

Analog DLC

The built-in DSS field on the MERLIN II System Display Console corresponds to physical station jacks in the control unit instead of specific extension numbers in the numbering plan. Therefore, DSS buttons on the MERLIN II System Display Console cannot be used to monitor the busy status of trunk pools (Hybrid/PBX only) or, with Group Calling, to monitor the busy status of a calling group.

An analog DLC cannot be used for system programming; however, System Speed Dial numbers, the system date, and the system time can be programmed from an analog DLC connected to the first analog station jack only when the line/trunk and station module with that jack is in slot 01 of the control unit.

Single-Line Telephones

A single-line telephone cannot be assigned as a DLC.

Mode Differences

Hybrid/PBX

In the Hybrid/PBX mode, DLCs can be assigned with queued call consoles (QCCs). A QCC must be connected to the first station jack on the first MLX module (called the primary system operator position).

Pool buttons cannot be assigned on a DLC; however, trunks included in a pool can be assigned as Personal Line buttons on a DLC.

Trunks that are not assigned to buttons on the DLC can be selected by the system operator only by dialing the pool dial-out code from the System Access button or, on digital DLCs, by selecting a DSS button for the pool dial-out code. Trunks that are not assigned to a pool cannot be selected from a DLC unless they are assigned to buttons on the console.

Shared System Access buttons cannot be assigned to DLCs.

Key and Behind Switch

Only DLCs (and not QCCs) are allowed in the Key and Behind Switch modes.

A DLC system operator cannot select lines that are not assigned to buttons on the console.

Considerations

■ The maximum number of system operator positions is determined by the type of telephone used as a DLC (see Table 2-4). In addition, when both DLCs and QCCs are assigned in the Hybrid/PBX mode, the maximum combined number of both types is eight; no more than four can be QCCs.

■ Only multiline telephones connected to the first and fifth station jacks on a digital or analog module can be assigned as DLCs. This includes DLC positions used for calling group supervisors and Call Management System (CMS) supervisors.

■ A maximum of two DLCs can be assigned per MLX or analog module.

■ A DLC cannot be located off premises.

■ When only DLCs (and not QCCs) are assigned, the first DLC connected to the control unit is the primary system operator position. When the system is first connected, all "Dial 0" calls, invalid-destination calls from Remote Access users, and unassigned direct inward dialing (DID) calls (in the Hybrid/PBX mode) are directed to this position.

■ CMS equipment is connected to analog station jacks that are assigned as DLCs. Two DLCs on the same module must be assigned for each CMS (a maximum of two) connected to the system.

■ A DLC is not operable during a power failure.

Table 2-4 Maximum Number of System Operator Positions

Position Type	Type of Telephone	Size of Processor	Maximum Positions
DLC	MLX-20L MLX-28D	Small	6
DLC	MLX-20L MLX-28D	Large	8
DLC	Analog multiline telephones	Small or large	8
QCC	MLX-20L	Small or large	4

Feature Interactions

Alarm

The DLC system operator uses an Alarm button to monitor system operation. The red LED next to the Alarm button on the system operator console goes on when the system detects a problem that requires immediate attention. A system operator with a digital DLC can use Inspect to display the number of alarms; a system operator with an analog DLC cannot use Inspect.

On a system with fewer than 29 lines, an Alarm button is factory assigned to analog DLCs with 34 or more buttons. On a system with more than 29 lines, Alarm is replaced with line 30. An Alarm button is factory assigned to an MLX-28D used as a DLC, regardless of the number of lines/trunks connected to the system. The Alarm button is not a fixed feature and can be assigned to any available button on an analog or MLX DLC.

Auto Dial

An inside Auto Dial button can be assigned to a DLC. The DLC system operator can use the buttons to transfer a call, make an internal call, or determine whether or not the extension is available.

Barge-In

Barge-In enhances call handling by allowing the DLC system operator to contact a person who is on a call or is using Do Not Disturb (Barge-In does not override Privacy). If the system operator uses Barge-in for a co-worker who is using Coverage or Forward (including Remote Call Forward), the call from the system operator is not directed to the destination telephone.

Calling Restrictions

Calling restrictions can be assigned to DLCs. Since restrictions apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.

Call Waiting and Camp-On	When the DLC system operator uses Camp-On to transfer a call to a busy extension, the call is placed in the Call Waiting queue and the caller hears the Call Waiting tone whether or not the extension has the Call Waiting feature activated.
	If the system is programmed for One-Touch Transfer with automatic completion, the system operator uses Camp-On by pressing the Transfer button, dialing the extension manually, activating Camp-On, hanging up, and pressing another line button or the Transfer button again. If the system operator presses an Auto Dial or DSS button, the transfer is automatically completed and Camp-On cannot be used.
Coverage	A DLC can be both an individual or Group Coverage receiver and a member of a coverage group. No more than eight Primary Cover, Secondary Cover, or Group Cover buttons can be assigned on a DLC.
Directory	A system operator with a digital DLC can use all the Directory features.
Disallowed Lists	Disallowed Lists can be assigned to DLCs. Since restrictions imposed by a Disallowed List assignment apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.
Do Not Disturb	The green LED next to an Auto Dial or DSS button on a DLC goes on when a user activates Do Not Disturb.
Extension Status	Extension Status capability can be assigned to DLCs only. In the hotel configuration, only a DLC system operator can change an extension to status 0. In the Group Calling/CMS configuration, a calling group or CMS supervisor uses a DLC to monitor and change group member status.
Forward and Follow Me	A DLC system operator can forward calls to extensions and, if the capability is assigned in system programming, to outside telephone numbers. Since outside lines are assigned as Personal Line buttons on the console, the capability to forward calls received on each outside line (excluding loop-start lines/trunks with unreliable disconnect) to an outside number must also be assigned in system programming and can be assigned to only one telephone for each individual line/trunk.
Group Calling	A DLC can be a member of a calling group and is normally used as the calling group supervisor position.

Hold

When programmed system wide, DLC Operator Automatic Hold puts an active call on hold when the DLC system operator presses another line button. When One-Touch Hold is programmed system wide, pressing an Auto dial button or DSS button also puts an active call on hold. Both prevent accidental disconnection of callers and speed call handling.

The DLC system operator hears an abbreviated ring as a reminder of a call on hold every time the interval programmed for the Operator Hold Timer (10-255 seconds) expires.

Messaging

The Send/Remove Message feature is a system operator-only feature used by the DLC system operator to turn on the Message LED to indicate a message is waiting. For telephones without a display, Send/Remove Message is the only way the Message LED can be turned on and off by system operators.

A Send/Remove Message button is factory assigned to an MLX-28D used as a DLC. When a system has fewer than 29 lines connected, Send/Remove Message is factory assigned to analog DLCs with 34 buttons or more. The Send/Remove Message button is replaced with line 32 when the system has 32 lines or more. Send/Remove Message is not a fixed feature and can be assigned to any available button on either an analog or MLX DLC.

Multi-Function Module

An MFM cannot be assigned as a DLC.

Night Service

A Night Service button is assigned to operator consoles only and is used by a DLC system operator to activate and deactivate Night Service.

On a system with fewer than 29 lines, a Night Service button is factory assigned to analog DLCs with 34 buttons or more. On a system with more than 30 lines, the Night Service button is replaced with line 31. An Alarm button is factory assigned to an MLX-28D used as a DLC, regardless of the number of lines/trunks connected to the system. The Night Service button is not a fixed feature and can be assigned to any available button on either an analog or MLX DLC.

Paging

The line/trunk jack programmed as a loudspeaker paging port can be assigned to a button on an analog or digital DLC for one-touch access. A system operator with a digital DLC can also access a loudspeaker paging system by dialing the line/trunk number (801-880) for the line/trunk jack on which the loudspeaker paging system is connected.

Park

Eight Park zone codes are automatically reserved for parking calls from a DLC. The factory-set extension numbers are 881-888. These numbers cannot be assigned to the DSS buttons on a MERLIN II System Display Console. To assign the park zones to a DSS connected to a digital DLC, the extension numbers must be in the range programmed for the Page buttons.

A system operator can program the Park zone codes on inside Auto Dial buttons. An inside Auto Dial button can also be programmed with a user's (including a system operator's) own extension number and can be used to park calls. When the system is programmed for One-Touch Hold with manual completion, the user hears a busy signal and completes the transfer by hanging up or pressing the Transfer button.

Personal Lines

The factory setting in all modes for analog DLCs is that the first 32 lines connected to the system are automatically assigned as personal lines. For digital DLCs the first 18 lines connected to the system are automatically assigned as personal lines.

Pickup

A DLC can be part of a Pickup group. This allows other group members to provide backup coverage for the DLC. In turn, the DLC system operator use Pickup to answer calls on line/trunks that are not assigned to buttons on the console.

Pools

In the Hybrid/PBX mode, a Pool button cannot be assigned to a DLC. The DLC system operator uses trunks in pools by dialing the pool dial-out code from a System Access button, or on a digital DLC with a DSS, by pressing the DSS button associated with the pool dial-out code. Trunks assigned to pools can be assigned as personal lines (assigned to line buttons) only on a DLC.

Queued Call Console

Both DLCs and QCCs can be assigned in the Hybrid/PBX mode. The maximum combined number of system operator positions is eight; no more than four can be QCCs. In a system with both DLC and QCC positions, the primary system operator position must be a QCC. All "dial 0" calls are directed to the QCC queue and do not ring at any DLC positions.

A DLC cannot use Position Busy, which is used only for QCCs. A DLC cannot be assigned as a Position Busy backup for a QCC (only calling groups can provide backup for a QCC).

Reminder Service

DLC system operators can use Reminder Service to set or cancel reminders for other users. The system operator can also see when a reminder was missed (the user did not answer the call) and cancel the missed reminder. The Missed Reminder feature can be used only on system operator positions.

Remote Access

Invalid Remote Access calls can be programmed to ring on an Intercom or System Access button on a DLC.

Speed Dial

System Speed Dial numbers, the system date, and the system time can be programmed from the first DLC connected to the first analog station jack.

System Access

Shared System Access buttons cannot be assigned to DLCs.

Transfer   A direct-line console system operator uses transfer to direct calls to other users, as described in the "Transfer" feature section.

System Programming

■ Assign or remove an individual DLC position.

> **Operator -> Positions -> Direct Line**

■ Enable or disable DLC Operator Automatic Hold feature system wide. The feature cannot be assigned to individual DLCs. The factory setting is disabled.

> **Operator -> DLC Hold**

■ When One-Touch Transfer is programmed, select either automatic or manual completion for system operators. The factory setting is automatic completion.

> **Options -> Transfer -> One Touch -> Transfer -> Enter**

■ Change the Operator Hold Timer from the factory setting of 60 seconds to 10-255 seconds system wide. The feature cannot be assigned to individual DLCs and is applicable to both DLCs and QCCs.

> **Operator -> Hold Timer**

Related Features

■ Queued Call Console

Directory

Extension Programming

> **MLX Display Labels:**
> System Directory: Directory, System Dir
>   [Dir, SysDir]
> Extension, Directory: Directory, Ext Dir [Dir, ExtDr]
> Personal Directory: Directory, Personal Dir (MLX-20L only)

Description

The Directory feature is a built-in, interactive telephone book that stores listings that include names and telephone or extension numbers and provides automatic dialing of the numbers to users with MLX display telephones. The listings are divided into three types of directories:

■ **System.** Lists names and numbers of outside contacts (such as clients and suppliers). These listings are created in system programming and are assigned System Speed Dial codes to allow users with telephones other than MLX display telephones to dial the listings in the directory. See "Speed Dial" in this chapter for details.

■ **Extension.** Lists all users in the system and their extensions. These listings are automatically created, and names are included via system programming by using the Labeling feature.

■ **Personal.** Lists individual users' listings of frequently called people or businesses and their telephone numbers. Personal Directories are available only on MLX-20L™ telephones and are accessible only from the telephones used to create them. Extension numbers can be programmed in a Personal Directory. However, in the Key and Behind Switch modes, the user must press an Intercom button before selecting the listing to dial the number.

On MLX display telephones, users can search the directories, select a listing, and dial the appropriate number with the press of a display button. On all other types of telephones, users can dial the listings in the System Directory by dialing the System Speed Dial codes assigned to the listings. However, users must dial extension numbers to call co-workers—they cannot use the Extension Directory.

Telephone Differences

Multiline Telephones

A user with an analog multiline telephone or with an MLX-10 telephone cannot use the Extension Directory feature or the Personal DIrectory feature but can dial the listings in the System Directory by dialing the System Speed Dial codes assigned to the listings.

MLX-20L Telephones

To use the System or Extension Directory feature, an MLX-20L telephone user presses the Menu button and selects either type of directory from the display. The user then selects a range of letters from which to begin the search. The first seven listings from the directory that begins with the first letter in the range are shown.

To scroll through the listings, the user selects Next Page (the next seven entries are shown) or Prev Page (the previous seven entries are shown) from the display. To display the telephone number associated with an individual listing, the user selects Show Number from the display (Show Number is highlighted) and presses the button next to the listing. To exit the Show Number function, the user selects Show Number again (the highlight is removed from Show Number). To automatically dial a number for a listing shown on the display, the user presses the button next to the listing.

Note: The telephone number for a "marked" System Directory listing is shown by using Show Number. A marked System Directory listing is a listing that has been tagged in system programming to suppress the telephone number from the display when the number is dialed by using the display or the System Speed Dial code.

To use the Personal Directory, an MLX-20L telephone user presses the Home button; a queued call console (QCC) system operator presses the Directory button from the Home screen. If the user has programmed listings to appear on the Home screen, the first eight listings (six listings for a QCC system operator) are shown. To see the second eight listings (six listings for a QCC system operator), the user selects Next Page. To select listings by using a range of letters, the user presses Next Page twice and follows the same procedure to search for listings as for System and Extension Directories. To automatically dial a number for a listing shown on the display, the user presses the button next to the listing.

MLX-28D and MLX-10D Telephones

To use either the System or Extension Directory, the MLX-28D or MLX-10D user presses the Menu button and selects either type of directory from the display. To begin the search, the user spells the name of the directory entry by using the dial pad. For example, to spell the name Wayne, the user dials 92983 and selects Enter from the display, the name with the closest match is displayed.

The user can scroll through the listings by selecting Prev (the previous listing is shown) or Next (the next listing is shown). To start a new search, the user selects New. To dial the number for the name currently shown on the display, the user selects Dial and the number is automatically dialed. if the display of the telephone number has not been suppressed, ">" appears on the far right of the display and indicates that the user can press the More button to see the number dialed.

Single-Line Telephones

Single-line telephone users cannot use the Extension Directory feature or the Personal Directory feature but can dial the listings in the System Directory by dialing the System Speed Dial codes assigned to the listings.

Considerations

■ The following parameters apply to the System Directory

- The listings are established and changed only through system programming by using the Labeling feature.

- Up to 40 listings are stored with a small processor module, and up to 130 listings are stored with the large processor module.

- Each listing consists of a three-digit speed dial number, an 11-character name field, a 40-digit number field, and a two-digit tag field. The tag field is used to mark the listing and suppress the display of a confidential number when the number is dialed via the display or the System Speed Dial code associated with the number while dialing, users see only the System Speed Dial code associated with the listing. Dialing the marked number by using the System Directory listing overrides any calling restrictions assigned to the telephone if the number dialed includes a toll number in addition to an access code.

  The tag does not however, prevent the telephone number from being displayed when an MLX-20L telephone user selects Show Number to display the telephone number associated with an individual listing.

- Names are created and associated with listings in the System Directory through the telephone feature.

For information on special characters and their meanings, see Appendix D.

- Special characters may be needed when programming outside Auto Dial buttons. Each of these characters counts as one of the 40 digits allowed in the telephone number.

■ The following parameters apply to the Extension Directory:

- The listings are established and changed only through system programming by using the Labeling feature.

- All of the extensions in the system can be stored.

- Each listing connsists of a seven-character name field and a number field for up to four digits.

- While the extension is being dialed, it cannot be suppressed from display telephones.

■ The following parameters apply to the Personal Directory:

- In systems with a small processor module, only 16 users of MLX-20L telephones can have Personal Directories; in systems with a large processor module, the number of MLX-20L telephones with Personal Directories is limited to 48.

- A maximum of 50 listings can be included in a Personal Directory.

- Each listing consists of an 11-character name field, a 28-digit number field, and a two-digit tag, which is used to suppress the telephone number during dialing.

For information on special characters and their meanings, see Appendix D.

■ Special characters may be needed when programming outside Auto Dial buttons. Each of these characters counts as one of the 28 digits allowed.

■ A listing cannot be used if the first character of the listing is a punctuation character such as a hyphen.

■ An MLX20L telephone user (excluding a QCC system operator) can display up to 16 Personal Directory listings on the Home screen. Frequently used features and not Personal Directory listings are displayed on a QCC system operator's Home screen.

■ A user can add, change, replace, and delete listings from the Personal Directory.

■ While the Directory feature is in use, the LEDs on the telephone go off and the telephone rings just as it does during programming. The user can answer calls but cannot determine whether a call is ringing since ringing and LED indication are not operating normally.

■ If a user tries to dial a System Directory listing with incomplete information (for example, the name field is populated but the number field is not), the user continues to hear dial tone and the number is not dialed.

■ When a listing is not located and the message "No Match Found" is displayed, selecting Next or Previous does not reverse the search direction. To reverse directions, the user must press the Home or Menu button to exit and repeat the search process from the beginning.

■ The search screens do not show the type of directory (System, Personal, or Extension) being used.

Feature Interactions

Account-Code Entry

An MLX-20L telephone user can program account codes either individually or with a telephone number in a Personal Directory listing. However, the user must lift the handset or press the Speakerphone button before selecting the listing from the display.

Allowed Lists and Calling Restrictions

When a marked System Directory listing includes a toll telephone number in addition to an access code, using the System Directory to dial the number overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.

A user with an outward-restricted telephone cannot dial an outside number by using a Personal Directory or System Directory listing (excluding a marked System Directory listing) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number by using a Personal Directory or System Directory listing (excluding a marked System Speed dial code) unless the number is on an Allowed List assigned to the telephone.

Automatic Route Selection	On Hybrid/PBX systems, System Directory and Personal Directory (MLX-20L telephones only) numbers can include the ARS dial-out code.
Conference	The Extension, Personal, and System Directory features can be used to set up conference calls.
	The Conference button is pressed to enter the Flash special character in a directory listing telephone number. The Drop button is pressed to enter the Stop special character in a directory listing telephone number.
Direct-Line Console	A system operator with a digital DLC can use all the Directory features.
Disallowed Lists	A user with an unrestricted telephone cannot dial an outside number by using a Personal Directory or System Directory listing if the number is in a Disallowed List assigned to the telephone, unless the number is dialed by using a marked System Directory listing. If the number is dialed by using a marked System Directory lifting and the number includes a toll telephone number in addition to an access code, dialing the number overrides any Disallowed List assignment and the telephone user can dial the number.
Display	MLX display telephone users can use the Extension and System Directories. Users search for stored listings on the display and automatically dial the listing by pressing the corresponding button. MLX-20L telephone users also can create a Personal Directory.
	The telephone rings and the LEDs go off when Directory is selected from the display. If the user is on a call with the speakerphone, the speakerphone LED goes off and does not go back on when the user presses the Home button to return to normal call handling.
	When a user dials by using a Directory feature, the digits dialed are shown on line 1 of the display.
Forced Account Code Entry	An MLX-20L telephone user can program account codes either individually or with a telephone number in a Personal Directory listing. However, the user must lift the handset or press the Speakerphone button before selecting the listing from the display.
Hold	The Hold button is pressed to enter the Pause special character in a directory listing telephone number.

Labeling	Labeling is used to enter names of people, groups, and locations associated with the extensions in the system that are stored as listings in the Extension Directory. Labels (such as the name of a person or a business) associated with System Speed Dial numbers are also entered by using the Labeling feature and stored as listings in the System Directory. Labels for lines/trunks are shown on the display when outside calls are made and received.
Last Number Dial	Last Number Dial does not store a number dialed by using a Personal, Extension, or System Directory.
Messaging	When an Extension Directory is used to call a co-worker with a posted message, the posted message is not displayed on the caller's telephone.
Personal Lines	A System or Personal Directory (MLX-20L only) can be used to dial numbers on a personal line. An Extension Directory is used only for inside calls and cannot be used to dial calls on a personal line.
Pools	When a pool dial-out code is included in the telephone number for a Personal or System Directory listing, one or two pause characters must be programmed immediately following the pool dial-out code to allow time to receive the telephone company dial tone. Pause characters are entered by pressing the Hold button.
Queued Call Console	Directory features are used instead of Auto Dial to allow QCC system operators to dial extensions or telephone numbers with the touch of a button. Directory features can be used for transferring calls. If a system operator releases the call immediately after pressing the button for the listing, the caller hears the dial tone plus the touch-tones for the dialed digits. If the system operator waits until after dialing begins, the caller does not hear the dial tone and dialed digits.
Recall	The Conference button is pressed to enter the Flash special character, which simulates pressing the Recall button, in a directory listing telephone number.
Saved Number Dial	Saved Number Dial does not store numbers dialed by using a Personal, Extension or System Directory listing.

System Programming

■ See "Labeling" and "Speed Dial" sections.

Related Features

■ Auto Dial

■ Personal Speed Dial

■ System Speed Dial

■ Labeling

Direct Station Selector

Description

One or two Direct Station Selectors (DSSs) can be connected to an MLX-20L or MLX-28D telephone assigned as a system operator position. The DSS enhances the call-handling capabilities of a system operator with a direct-line console (DLC) or a queued call console (QCC). When connected to an MLX-20L telephone used as a system programming console, the DSS facilitates system programming and centralized telephone procedures. When used with the Extension Status feature or by the calling group or Call Management System (CMS) supervisor, the DSS allows the user to determine, at a glance, calling group or CMS group member status or room status.

The DSS provides the following call-handling capabilities or information:

■ One-touch dialing of inside extensions

■ One-touch transfer

■ One-touch hold (DLC only)

■ On-hook, off-hook, or do-not-disturb status of stations in the system

■ Extension Status indication (room or group member status)

■ Calling group queue status

■ Message-waiting LED status

■ System operator park zones

The DSS (Figure 2-5) has an array of 50 status/select buttons, called DSS buttons, with red LEDs. A maximum of two DSSs can be connected together to provide a field of 100 status/select buttons. Ten additional fixed-feature buttons with green LEDs are at the bottom of the DSS. The first three (from left to right) on the top row are Page buttons, which are used to select the range of extension numbers represented by the status/select buttons. A fourth button (lower left-most) is the Message Status button, which is used to change to and from message status operation. The LED next to each DSS button indicates whether or not a message is waiting from a system operator. The remaining six buttons on the first DSS and the ten buttons at the bottom of the second DSS are not operable (reserved for future use).
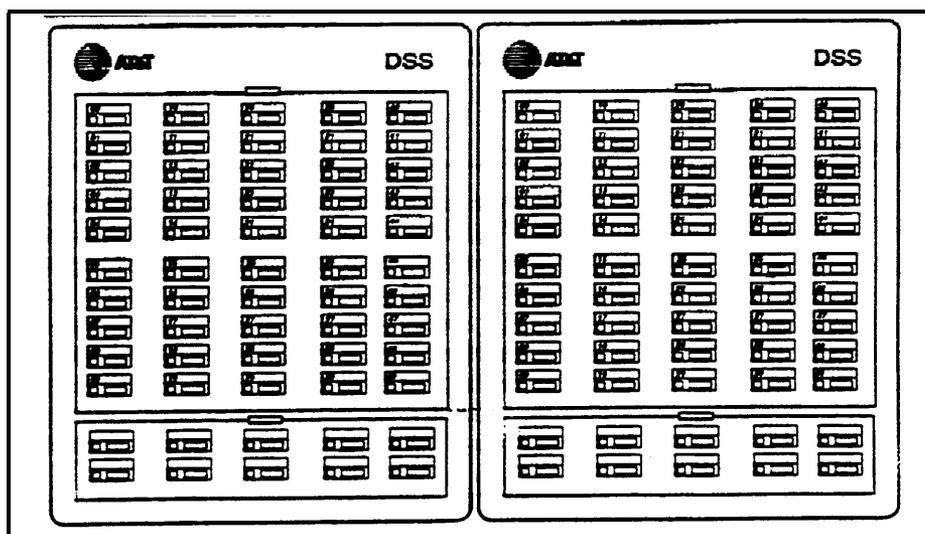
Figure 2-5 Direct Station Selectors

The range of 50 or 100 extension numbers assigned in system programming to DSSs is considered a "page." A single DSS can have three pages of extension numbers for a total of 150 extension numbers. When two DSSs are connected, this capability is increased to 100 extension numbers per page for a total of 300 extension numbers.

The beginning number for each page is assigned via system programming (by using the SysRenumber option). When the operator presses a Page button, the page of the DSS corresponds to a range of 50 (for a single DSS) or 100 (when two DSSs are connected) extension numbers. The factory settings for Page buttons are as follows: the Page 1 button begins with extension 0, the Page 2 button begins with 50, and the Page 3 button begins with 100.

Each Page button can be programmed to begin with any extension number that is a multiple of 50 in the range of 0-9950. However, to speed call handling, it is recommended that the assignments be sequential—the range starting with the lowest extension number should be assigned to Page 1, the range starting with the next higher extension number should be assigned to Page 2, and the range starting with the highest extension number should be assigned to Page 3.

Each of the 50 DSS buttons corresponds to one of three extension numbers. The specific extension number is determined by the Page button that the system operator presses. For example, if the first extension number for the Page 1 button is programmed to be extension 100, the DSS buttons and associated LEDs on a single DSS correspond to extensions 100 to 149. The specific extensions represented by each DSS button are assigned from top to bottom, left to right as shown in Figure 2-6.
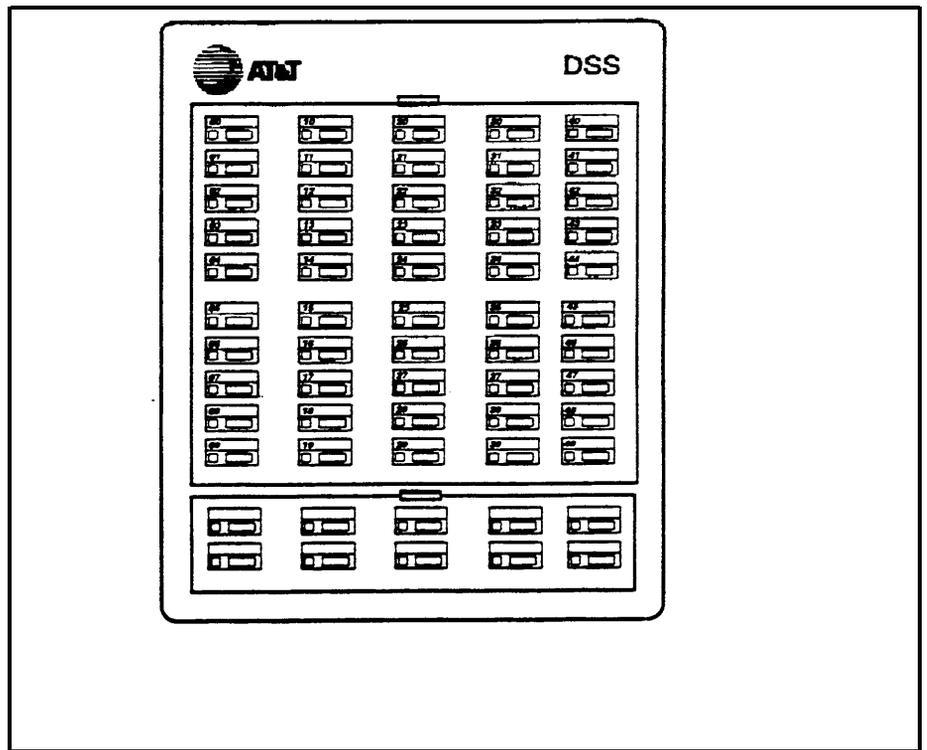
Figure 2-6 DSS Extension Assignment Sequence

Each DSS button can correspond with extension numbers for one of the following:

■ User extension number.

■ Line/trunk number (801-880)

■ Pool dial-out code (Hybrid/PBX) only

■ Calling group extension number

■ Paging group extension number

■ System operator Park zone access code

■ Access code (usually a 9) for Automatic Route Selection (ARS-Hybrid/PBX only) or Idle Line Preference (Key and Behind Switch only)

■ Remote Access dial code

■ Listed Directory Number (the extension for the QCC queue-Hybrid/PBX only)

The use and the meaning of the LEDs for each DSS button depend on the extension represented by the button and whether the system operator position is used for normal call handling with or without active message status operation, such as a calling group or CMS supervisor position with or without active message status operation or, if Extension Status is assigned to the position, Extension Status in the hotel configuration.

Normal Call-Handling Operation

Normal call-handling operation is in effect when the position is not in supervisor, message status, or hotel Extension Status operation. The DSS buttons are used for one-touch dialing of extension numbers. When a button for a user extension, calling group extension. or paging group extension is pressed, the extension number is automatically dialed. In the Hybrid/PBX mode, the system operator can either select a specific pool or dial the ARS code by pressing the DSS button for a pool dial-out code or ARS code. If a DSS button for any of the extensions or codes mentioned above is pressed before the handset is lifted, the speaker is automatically turned on and an Intercom or System Access button is selected.

When a DSS button is pressed for a user extension that is "high and dry" (the user is not active on a call and is not listening to dial tone), a signal (beep) is sent to the user's telephone.

A system operator can also use a DSS button to activate a feature that requires an extension number—Barge-In, Conference, Send/Remove Message, Forward (including Remote Call Forward), Follow Me, Leave Word Calling, Reminder Service, and Transfer. To do this, the system operator presses the programmed or fixed feature button, or presses the Feature button and dials the feature code, and then presses the DSS button for the extension number.

The result of pressing a DSS button while on a call depends on the type of system operator position, the type of button pressed, and how the system is programmed for transfers (see Table 2-5).

Table 2-5 Results of Pressing DSS Button While Active on a Call

Position Type	Transfer Feature	Extension Type	Result
DLC	One-Touch Hold	User, calling group, paging group	An outside caller is put on hold, an Intercom or System Access button is automatically selected, and the extension number is automatically dialed. Transfer is not automatically initiated. If the system operator wants to transfer the outside call to another extension or to an outside number, the Transfer button must be pressed before pressing the DSS button. An inside call is not put on hold and Transfer is not automatically activated. If the DSS button is for a user, a signal (beep) is sent to the user associated with the DSS button. If the DSS button is for a calling group or paging group, pressing the DSS button has no effect.
		Pool dial-out code, ARS code	The caller is put on hold, Transfer is initiated, the pool dial-out code or ARS code is automatically dialed, and the system operator can then dial the outside telephone number. Transfer completion is always manual—the system operator must press another button or hang up to complete the transfer.
		Park zone	The Park feature is activated, and the call is put on hold on the selected park zone to allow pickup from any extension in the system.
		Line/trunk number, Listed Directory Number, unassigned extension numbers, dial 0	Ignored, no effect

Table 2-5 Continued

Position Type	Transfer Feature	Extension Type	Result
DLC, cont.	One-Touch Transfer	User or calling group	The caller is put on hold, Transfer feature is initiated, an Intercom or System Access button is automatically selected, and the extension number is automatically dialed. If manual completion is programmed, the system operator must press another button or hang up to complete the transfer. If automatic completion is programmed, the transfer is automatically completed.
		Pool dial-out code or ARS code	The caller is put on hold, Transfer is initiated, the pool dial-out code is automatically dialed, and the system operator can then dial the outside telephone number. Transfer completion is always manual—the system operator must press another button or hang up to complete the transfer, regardless of whether the system is programmed for manual or automatic completion.
		Paging group	The caller is put on hold, an Intercom or System Access button is automatically selected, and the Paging group extension number is automatically dialed. Transfer is not automatically initiated regardless of whether the system is programmed for One-Touch Hold or One-Touch Transfer since calls cannot be transferred to a paging group.
		Call park zone	The Park feature is activated and the call is put on hold on the selected park zone to allow pickup from any extension in the system.

Table 2-5 Continued

Position Type	Transfer Feature	Extension Type	Result
DLC, cont.	One-Touch Transfer, cont.	Line/trunk number, Listed Directory Number, unassigned extension numbers, dial 0	Ignored, no effect
QCC	N/A	User or calling group	The caller is put on hold, the call transfer process is initiated, internal dial tone is automatically provided, and the extension number is automatically dialed. If manual extended call completion is programmed, the system operator must press the Release button or hang up to complete the transfer. If automatic extended call completion is programmed, the transfer is automatically completed.
		Pool dial-out code or ARS code	The caller is put on hold, the call transfer process is initiated, internal dial tone is automatically provided, and the pool dial-out or ARS code is automatically dialed. The system operator can then dial the telephone number. Transfer completion is always manual—the system operator must press the Release button or hang up to complete the transfer, regardless of whether manual or automatic extended call completion is programmed.
		Paging group	The caller is put on hold, a Call button is automatically selected, and the paging group extension number is automatically dialed. The call transfer process is not automatically initiated since calls cannot be transferred to a paging group.

Table 2-5 Continued

Position Type	Transfer Feature	Extension Type	Result
QCC, cont.		**Call park zone**	The Park feature is activated and the call is put on hold on the selected park zone to allow pickup from any extension in the system.
	N/A	**Line/trunk number, Listed Directory-Number, unassigned extension numbers, dial 0**	Ignored, no effect

The red LEDs for each DSS button are used to determine whether a user is on a call (off-hook), has no call active (on-hook), or is using Do Not Disturb. The LED indication (on) is not different for off-hook and Do Not Disturb; therefore, the system operator cannot determine whether the user is on a call or has activated Do Not Disturb. For a calling group extension on a DSS button, the red LED indicates the status of the queue. For a pool dial-out code on a DSS button, the red LED indicates trunk available.

Table 2-6 shows the meanings of the red LEDs for DSS buttons while the system operator position is in the normal operation and message status is not active.

Table 2-6 LED Meanings for Normal Call-Handling Operation without Message Status Active

LED Status	Extension Type	Meaning
Off	User	The person is not on the telephone and is not using Do Not Disturb.
	Line/trunk number	The line/trunk is not in use.
	Pool dial-out code	At least one trunk is available for making an outside call.
	Calling group	The calling group queue is below the allowable threshold.
	Paging groups	The group is available for making a group announcement.
	Operator park zone	A call is not parked on this park zone code.
	ARS, Remote Access, Listed Directory Number	Not applicable; red LED is always off.
On	User	The person is on the telephone or has activated the Do Not Disturb feature.
	Line/trunk number	The line/trunk is in use.
	Pool dial-out code	No trunks are available in this pool for outside calls.
	Calling group	The calling group queue is at or above the allowable threshold.
	Paging group	An announcement is being made to paging group.
	Operator park zone	A call is parked on this park zone code.

Table 2-6 Continued

LED Status	Extension Type	Meaning
On, cont.	ARS, Remote Access, Listed Directory Number	Not applicable, red LED is always off.
Fast flashing	User	The person is calling the system operator position.

Note: Fast flashing is not applicable for the rest of the extension types.

Slow flashing	User	A call transferred by the system operator to the extension is returning.
	Line/trunk number	A call is ringing on this line/trunk.

Note: Slow flashing is not applicable for the rest of the extension types.

Calling Group or CMS Supevisor Operation

A supervisor with a DLC switches from normal call handling to supervisory operation by pressing the Feature button, dialing 32, and pressing the Hold button. The effect of pressing a DSS button while in supervisor operation is the same as that described for normal call-handling operation. Message status operation is described later in this section.

When the supervisory position is not in message status operation (the green LED next to the Message Status button is off), the red LED next to each DSS button for a calling group member's extension is used to monitor the availability of members to take calls directed to the calling group. The LEDs for the rest of the extension number types (such as paging groups or line/trunk numbers) are always off and have no meaning while the position is not in message status operation.

The meaning of the red LEDs associated with each group member is shown in Table 2-7.

Table 2-7 LED Meanings for Supevisor Operation without Message Status Active

LED Status	Extension Status	Meaning
Off	0	The telephone is signed out from the group and the member is unavailable to take calls.
On	2	The telephone is signed into the group and calls can be sent to the member.
Slow flashing	1	Used for CMS only—the telephone is in the after call work" state and the group member is not available to take calls.

Note: The LEDs next to DSS buttons for all other types of extensions are always off and have no meaning.

Extension Status in Hotel Configuration Operation

When Extension Status is in the Hotel configuration, the Extension Status feature is assigned and removed from individual DLCs via system programming. (See "Extension Status" in this chapter for details.) When the Extension Status is assigned to a DLC position, the hotel Extension Status operation is always active. The effect of pressing a DSS button while in the hotel Extension Status operation is the same as that described for normal call-handling operation.

The red LED next to each DSS button for a room extension is used to monitor room availability, and the DSS button is used to restrict the telephones when the rooms are not occupied. The LEDs next to the rest of the extension number types are always off and have no meaning while the position is not in the message status operation.

The meaning of the red LED next to the DSS button for each room is shown in Table 2-8.

Table 2-8   LED Meanings for Hotel Extension Status Operation without Message Status Active

LED Status	Extension Status	Meaning
Off	0	The room is occupied and the telephone is in regular call-handling state.
On	2	The room is vacant and outside calls cannot be made from the telephone.
Slow flashing	1	The room is vacant and ready for cleaning. Outside calls cannot be made from the telephone.

Note: The LED next to the DSS button for all other types of extensions is always off and has no meaning.

Message Status Operation

Message status operation is in effect when the user presses the Message Status button (the lower left feature button on the first DSS) line in normal operation, supervisory operation, or Extension Status operation. The green LED next to the Message Status button is on when message status operation is active.

In normal call-handling operation, title the position is in message status operation, the red LEDs next to the DSS buttons for user extensions indicate whether or not the message-waiting LED was turned on by a system operator and do not indicate whether or not a message-waiting LED was turned on by another source, such as a fax machine or another user. An LED associated with a calling group extension or a pool dial-out code is always off while the position is in the message status operation.

If a system operator wants to turn on the message-waiting LED to indicate that a message is waiting, the system operator first checks the LED next to the receiver's DSS button to determine whether or not the Message LED is on. To turn the message on or off, the system operator presses the programmed Send/Remove Message button followed by the DSS button for the message receiver and presses the Message Status button to return to normal call handling. MLX DLC system operators can also use the Send/Remove Message feature by pressing the Feature button and selecting Send/Remove Message from the display. See "Messaging" in this chapter for more information on sending and receiving messages.

For calling group or CMS supevisor operation or for hotel Extension Status, while the position is in message status operation, the red LED next to a DSS button for a user extension indicates whether or not a user is on a call (off-hook), has no call active (on-hook), or has the Do Not Disturb feature active. On a DSS button for a calling group extension, the red LED indicates the status of the queue. For a DSS button for a pool dial-out code, the red LED indicates trunk availability.

The meanings of the red LEDs next to the DSS buttons while the system operator position is in the message status operation are shown in Table 2-9.

Table 2-9 Message Status Operation-LED Meanings

Operation	LED Status	Extension Type	Meaning
Normal call handling	Off	User	A system operator has not turned on the message-waiting LED.
		All other types	Not applicable; red LED is always off.
	On	User	A system operator turned on the message-waiting LED to indicate a message is waiting.
Supervisor or Hotel Extension status	Off	User	The person is not on the telephone and is not using Do Not Disturb.
		Line/trunk number	The line/trunk is not in use.
		Pool dial+out code	At least one trunk is available for making an outside call.
		Calling group	The calling group queue is below the allowable threshold.
		Paging group	The group is available for making a group announcement.
		Operator Park zone	A call is not parked on this park zone code.
		ARS, Remote Access, Listed Directory Number	Not applicable; red LED is always off.

Table 2-9 Continued

Operation	LED Status	Extension Type	Meaning
Supervisor or Hotel Extension status, cont.	On	User	The person is on the telephone or is using Do Not Disturb.
		Line/trunk number	The line/trunk is in use.
		Pool dial-out code	No trunks are available on this pool for outside calls.
		Calling group	The calling group queue is at or above the allowable threshold.
		Paging group	An announcement is being made to the paging group.
		Operator park zone	A call is parked on this park zone code.
		ARS, Remote Access, Listed Directory Number	Not applicable: red LED is always off.

Telephone Differences

Multiline Telephones   One or two DSSs can be connected only to an MLX-28D or MLX-20L telephone. A DSS cannot be connected to an MLX-10, MLX-10D, or analog multiline telephone.

Single-Line Telephones   A DSS cannot be connected to a single-line telephone.

Mode Differences

Hybrid/PBX   QCCs are used only in the Hybrid/PBX mode.

Key and Behind Switch	In the Key and Behind Switch mode, pressing the DSS button for a factory-set pool dial-out or ARS code does not show the status, and the system operator hears a fast busy signal if the button is pressed.
	In the Behind Switch Mode, DSS buttons for system operator call park zones are not operable.

Considerations

- One or two DSSs can be connected to an MLX-20L or MLX-28D telephone.

- A maximum of 16 DSSs is allowed with a large processor module, and a maximum of 12 DSSs is allowed with a small processor module.

- DSSs cannot be connected to an MLX-10, MLX-10D, analog multiline, or single-line telephone.

- DSS operation is supported only at a DLC or QCC.

- Only the Page buttons (first three buttons from left to right on the top row of first DSS), the Message Status button (lower left-most on first DSS), and the DSS buttons for extensions are used. The remaining six buttons and the ten buttons at the bottom of a second DSS are not operable (reserved for future use).

- A maximum of 160 extension numbers is represented on a single DSS, and a maximum of 300 extension numbers is represented by two DSSs.

- Each Page button can be programmed to begin with any extension number which is a multiple of 50 in the range of 0-9950. The factory setting is that Page 1 begins with extension 0, Page 2 begins with extension 50 and Page 3 begins with extension 100.

- The range of extensions represented by the DSS buttons is programmed system wide by using the System Renumber option. The beginning extension number associated with each Page button is the same for all system operator positions and cannot be programmed differently for individual system operator positions.

- If an extension is busy because features are being assigned through system or centralized telephone programming, the red LED next to the associated DSS button is off to indicate the busy condition.

- Transfer is always initiated and Transfer completion is manual when a system operator presses the DSS button corresponding to a line/trunk number, pool dial-out code (Hybrid/PBX only), or ARS access code (Hybrid/PBX only), even if One-Touch Hold, One-Touch Transfer with automatic completion (DLC only), or automatic extended call completion (QCC only) is programmed for the system.

■ When One-Touch Hold is programmed, only outside callers are automatically put on hold when a DSS button for a user, calling group, or paging group is pressed while another calli is active. For an inside caller, pressing a DSS button for a user sends a manual signal to the user's telephone; pressing a DSS button for a calling group or paging group has no effect.

■ Only DSS buttons corresponding to a system operator park zone can be used to park calls: calls cannot be parked on a DSS button corresponding to any other type of extension.

■ To park a call at a park zone, the system operator presses the DSS button for the park zone while the caller is on the line. If a system operator tries to park a call by pressing the Transfer button followed by the DSS button for the Park zone, the call is put on hold for transfer and is not parked. This can transfer a call to an outside number in error.

■ When a parked call returns from a park zone, the LED next to the button goes off and does not flash as it does for transfer returns.

■ To park a call at a park zone, the system operator with a DSS presses the DSS button for the park zone while the caller is on the line. When a DSS button for a paging group is pressed, the transfer process is not automatically initiated even if One-Touch Transfer (DLC only) or automatic Extended Call Completion (QCC only) is programmed for the system. Calls cannot be transferred to a paging group extension number.

■ For a QCC only, pressing the DSS button for a line/trunk number, Listed Directory Number, or unassigned extension number while active on a call is ignored.

Feature Interactions

Automatic Route Selection   The LED next to a DSS button for the ARS code is always off.

Barge-In   Barge-In can be activated by pressing a programmed Barge-In button after making a call to the user's extension by using a DSS button.

Camp-on   When Camp-On is used to complete a call transfer and the call returns, the DSS button for the extension where the call was transferred goes off and does not flash as it does for a transfer return or park return.

Coverage   When a system operator transfers an Individual or Group Coverage call and the call returns, the red LED next to the DSS button for the sender does not flash as it does for a transfer return for calls received on other types of line buttons.

Display

When the Page button is pressed, the display shows "Page," the page number selected, and the first extension number in the range. When the user presses Message Status button, the display shows "Message Status" to indicate that the DSS is in the Message Status operation. When the user presses a DSS button representing an extension number, the extension number is shown on the display while being dialed.

Extension Status

A calling group or CMS supervisor, or an operator at a DLC with Extension Status assigned can change the status of a group member or room by pressing a programmed Available or Unavailable Extension Status button and then pressing the DSS button for the group member or room.

Forward and Follow Me

Forward can be activated by pressing a programmed button or using a feature code and then pressing a DSS button corresponding to the destination user's extension number. Follow Me can be activated by using the feature code and then pressing a DSS button corresponding to the destination user's extension number.

Group Calling

The LED for a DSS button for a calling group extension number indicates the status of calls in the calling group queue. The LED is on when calls are at or above the programmed threshold and off when below the threshold.

When a system operator transfers a call to a calling group and the call returns, the red LED associated with the calling group does not flash as it does for a transfer return for user's extensions.

Inspect

Inspect can be used to determine the corresponding extension for each DSS button. To use Inspect, the user presses the Page button for the range of extensions, presses Inspect, and presses each individual DSS button to see the contents. The user can display information on only one extension at a time; to see information for another range of extensions, the user must press the Home button and repeat the process.

If a message is posted at an extension associated with a DSS button, the message is shown on page 2 of the display when the system operator inspects the DSS button.

Last Number Dial

An extension dialed by pressing a DSS button is not stored for Last Number Dial.

Messaging

When a system operator presses the Message Status button on a DSS, the LEDs on the DSS reflect only messages left by a system operator using the Send/Remove Message feature and not messages left by any co-worker (including a system operator) using the Leave Message feature.

Paging

Pressing a DSS button for a line/trunk programmed as a loudspeaker paging port only indicates whether or not the paging system is in use. The button cannot be used to gain access to the loudspeaker paging system. It can be used only to dial an extension for a paging group.

When a DSS button for a paging group is pressed, the transfer process is not automatically initiated even if One-Touch Transfer (DLC only) or automatic Extended Call Completion (QCC only) is programmed for the system.

Park

Park zone codes cannot be assigned to the DSS buttons on a MERLIN II System Display Console. For the park zones to be assigned to a DSS connected to an MLX system operator console, the extension numbers must be in the range programmed for the Page buttons.

When a system operator parks a call by using an associated DSS button and the call returns, the red LED associated with the park zone where the call was parked goes off and does not flash, as it does for a transfer return.

To park a call at a park zone, the system operator with a DSS presses the DSS button for the park zone while the caller is on the line. If a system operator tries to park a call by pressing the Transfer button followed by the DSS button for the park zone, the call is put on hold for transfer and is not parked. This can transfer a call to an outside number in error.

Pickup

The DSS buttons associated with a line/trunk number (801-880) cannot be used for answering calls on specific lines/trunks via the Individual Pickup feature. These DSS buttons are used strictly for busy or not busy status of each line/trunk.

Saved Number Dial

An extension dialed by pressing a DSS button is not stored for Saved Number Dial.

Signaling

If a user presses a Manual signal button programmed with the system operator's extension while making a call to the system operator, the LED next to the user's DSS button changes from flashing to on while the Manual signal button is held down.

System Numbering

The beginning extension for the range of 50 or 100 extensions represented by each Page button is assigned by using the System Renumber option from the System Programming menu. The factory setting is that Page 1 begins with extension 0, Page 2 begins with extension 50, and Page 3 begins with extension 100.

Transfer

The Transfer option of One-Touch Hold applies only to outside calls on a DLC and not to calls on a QCC. When One-Touch Hold is programmed, if a system operator presses a DSS button with an inside caller on the line or, in the Hybrid/PBX mode, with an outside caller on a System Access button, the call is not put on hold and a manual signal is sent to the extension corresponding to the DSS button pressed.

When One-Touch Transfer (with either manual or automatic completion) is programmed and the system operator presses the DSS button while the caller is on the line and no Intercom or System Access button is available on which to transfer the call, the call does not go on hold. If the system operator hangs up, the caller is disconnected.

System Programming

Assign or change the range of extensions represented by each Page button on Direct Station Selector consoles.

SysRenumber -> Single

Disallowed Lists

Description

A Disallowed List is used to restrict users from making calls to specific local or toll numbers. Assigned to individual telephones through system programming, a Disallowed list is a list of telephone numbers that the telephone user cannot dial. When a Disallowed List is assigned to a telephone, the user cannot dial the numbers included on the list even if the telephone is unrestricted.

Disallowed Lists can be used as an alternative or supplement to calling restrictions assigned to individual-telephones. For example, to prevent users from calling time and temperature, their horoscope, or other services typically offered on the 976 exchange, calls can be disallowed to that exchange. To prevent people from calling "talk" lines typically offered in the 900 area code, calls can be disallowed to that area code.

A "wild card" character (a Pause entered by pressing the Hold button) can be used to indicate that calls to an exchange are restricted in every area code. A pause is indicated on a planning form by the letter "p." For example, to restrict users from dialing the 976 exchange in every area code, the entry on the planning form is "976" to restrict calls to the 976 exchange in the home area code and "ppp976" to restrict calls to the 976 exchange in all other area codes.

Considerations

- A maximum of eight lists can be programmed and each list can contain a maximum of 10 numbers.
- Each number within a list can have a maximum of six digits (for example, an area code followed by an exchange). If a toll prefix is required for dialing, a leading 1 is not needed since the system assumes the leading 1 before an area code.
- Individual Disallowed Lists are numbered 0 through 7, and within each list, entries are numbered 0 through 9.
- Up to eight Disallowed Lists can be assigned to each telephone.

Feature Interactions

Allowed Lists   Disallowed Lists take precedence over Allowed Lists. If a telephone number is on both an Allowed List and a Disallowed List and both are assigned to an individual telephone, the user cannot dial the number.

Auto Dial   A user cannot dial an outside number by using an Auto Dial button if the number is on a Disallowed List assigned to the telephone.

Automatic Route Selection	The use of ARS does not allow the user to dial numbers on a Disallowed List assigned to the telephone. The system checks all restrictions before selecting the route.
Calling Restrictions	Disallowed Lists can be assigned to restricted telephones. If a telephone. number is included on both an Allowed Lists and a Disallowed List and both are assigned to an individual telephone, the user cannot dial the number.
Conference	A user cannot add outside people to a conference when the number is on a Disallowed List assigned to the telephone.
Direct-Line Console	Disallowed Lists can be assigned to DLCs. Since restrictions imposed by a Disallowed List assignment apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.
Directory	A user with an unrestricted telephone cannot dial an outside number by using a Personal Directory or System Directory listing if the number is in a Disallowed List assigned to the telephone, unless the number is dialed by using a marked System Directory listing. If the number is dialed by using a marked System Directory listing and the number includes a toll telephone number in addition to an access code, dialing the number overrides any Disallowed List assignment and the telephone user can dial the number.
Forward and Follow Me	A user cannot forward calls to an outside number (Remote Call Forward) if the number is on a Disallowed List assigned to the telephone. An error tone is not supplied when the user with a restricted telephone activates the Forward feature. However, when a call is received at the station, the system checks restrictions and denies the forward if the number is in the Disallowed List.
Personal Lines	A user cannot select a personal line and dial an outside number when the number is on a Disallowed List assigned to the telephone.
Queued Call Console	Disallowed Lists can be assigned to QCCs. Since restrictions imposed by a Disallowed List assignment apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.
Remote Access	Disallowed Lists are assigned as one of the items of the class of restriction (COR) for the Remote Access feature. When barrier codes are not used, Disallowed Lists are assigned to lines/trunks system wide. When barrier codes are used, Disallowed Lists are assigned to individual barrier codes.

Speed Dial

A user with an unrestricted telephone cannot dial an outside number by via Personal Speed Dial or System Speed Dial if the number is in a Disallowed List assigned to the telephone, unless the number is dialed by using a marked System Speed Dial code. If the number is dialed by using a marked System Speed Dial code and the number includes a toll telephone number in addition to an access number, dialing the number overrides any Disallowed List assignment and a the telephone user can dial the number via a System Speed Dial code.

System Access

In the Hybrid/PBX mode, a System Access button (include Shared System Access buttons) cannot be used to dial an outside number when the number is on a Disallowed List assigned to the telephone used to make the call.

Toll Type

When lines/trunks with different toll types are connected (for example, basic lines/trunks and PRI facilities), a toll prefix (0 or 1) must be dialed for toll calls on some lines/trunks and atoll prefix is not required for toll calls on other lines/trunks. In this case, two Disallowed List entries are required to restrict users from dialing specific area codes and/or telephone numbers. For example, to restrict users from dialing calls in the 505 area code on both toll types, one entry must be "1505" and the other entry must be "505." When the Disallowed List is assigned to a station, the "1505" entry restricts users from making calls to the 505 area code on lines/trunks that require a toll prefix and the "505" entry restricts users from making calls (including local calls) to the 505 area code on lines/trunks that do not require a toll prefix.

System Programmming

■ Establish, change, or remove Disallowed Lists.

```
Tables -> Disallow
```

■ Assign or remove Disallowed Lists from individual telephones.

```
Tables -> DisallowTo
```

■ Assign or remove Diallowed Lists from non-tie lines/trunks.

```
LinesTrunks -> RemoteAccss -> Non-TIE -> DisallowLst
```

■ Assign or remove Disallowed Lists from tie trunks.

LinesTrunks -> RemoteAccss -> TIE Lines -> DisallowLst

■ Assign or remove Disallowed Lists from individual Remote Access barrier codes.

LinesTrunks -> RemoteAccss -> BarrierCode -> DisallowLst

Related Features

■ Calling Restrictions

■ Allowed Lists

Display

Many of the MLX and analog multiline telephones compatible with the communications system have a display. The display helps users in three areas: call handling, telephone programming, and features usage. In addition, the display supports system programming when the MLX-20L telephone is used as a system programming console. (For more on system programming displays, see the *System Programming* book.)

The level of support the display provides depends on whether or not the user has an MLX or analog multiline telephone. For example, MLX telephones provide menu-driven telephone programming and allow users to select and use features from the display. Analog multiline telephones do not offer these capabilities.

Telephone Differences

MLX Telephones

There are two sizes of displays on MLX telephones: MLX-20L telephones have a 7-line by 24-character display, and MLX-28D and MLX-10D telephones have a 2-line by 24-character display.

Both the 7-line and the 2-line displays have four types of screens: the Home screen, the Menu screen, the Feature screen, and the Inspect screen. Users bring up these screens by pressing the corresponding imprinted button-for example, to see the Menu screen, the user presses the Menu button.

Home Screen

The Home screen (Figures 2-7 and 2-8) is the display's home base-it remains on the display unless the user selects another screen. If the user has programmed the telephone for a posted message and no call is active on the telephone, line 1 shows the message the user selected. When the user receives a call, Line 1 is overwritten with call-handling information, such as a number being dialed, the name or number of a caller, and the type of incoming call.

Line 2 shows the time and date. If the user activates certain features, any information currently shown on line 1 of the Home screen is replaced with prompts and feedback messages. When the telephone is idle, line 2 of the Home screen shows the date and time. If the timer is running or the user has programmed an Alarm, this information is also shown on line 2. On the MLX-20L telephone, listings from the user's Personal Director can be programmed to appear on the Home screens.
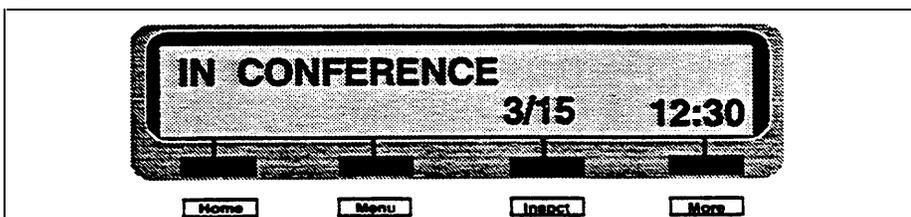
Figure 2-7   2-Line Display Home Screen
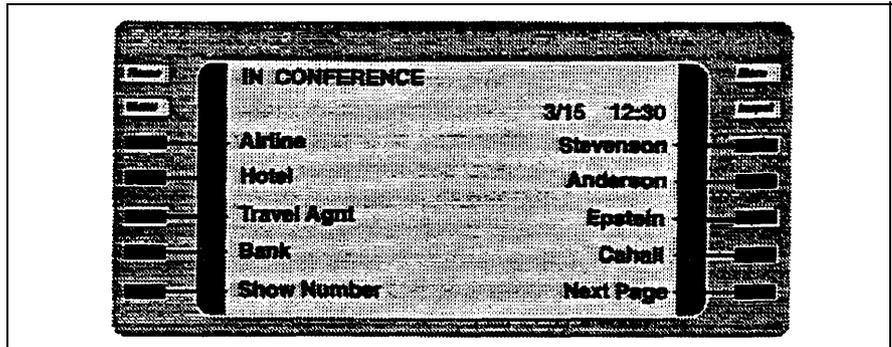
Figure 2-6   7-Line Display Home Screen

Menu Screen

The Menu screen (Figures 2-9 and 2-10) lists features and functions that are used through the display, such as Alarm Clock and Directory. For all display users except the QCC system operator, the Menu screen also provides access to the Extension Programming function used to program the telephone. (See Appendix B, General Telephone Programming Instructions, for more on the Extension Programming function.) The Menu screen is accessed by pressing the imprinted Menu button next to or below the display.
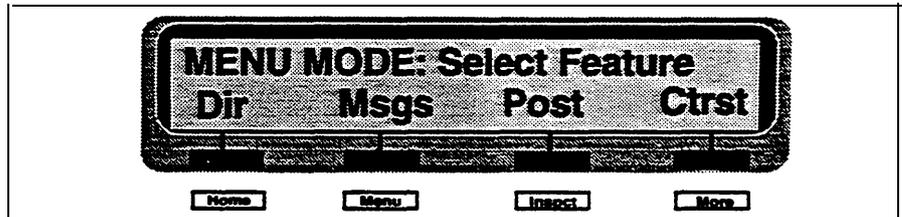
Figure 2-9   2-Line Display Menu Screen
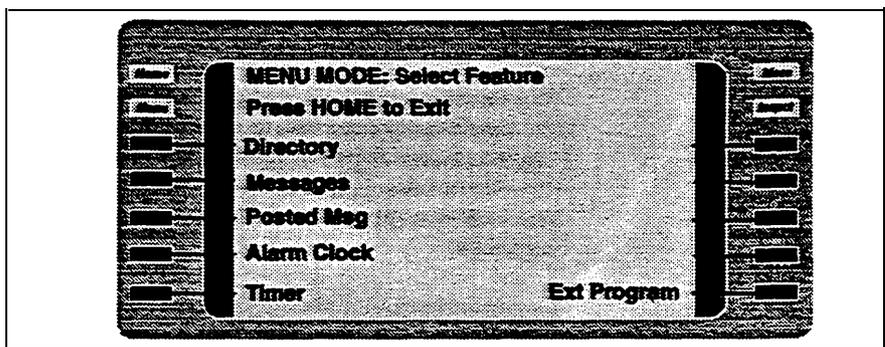
Figure 2-10   7 Line Display Menu Screen

Note: The Ext Program option is not included on the Menu screen shown on a QCC.

Inspect Screen

The Inspect screen (Figures 2-11 and 2-12) provides the user with two primary functions: "inspecting" calls on hold or incoming calls when the user is on another call, and "inspecting" existing feature button programming. To use Inspect, the user presses the Inspect button and then presses a line button. If the button is associated with a call, calling information is displayed. If the user inspects a line button with no associated call, the display shows the line assigned to the button. If the button is programmed with a feature, the display shows the name of the feature.
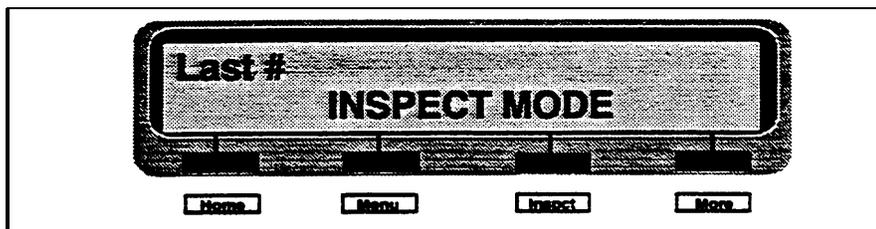
Figure 2-11   2-Line Display Inspect Screen for Programmed Button
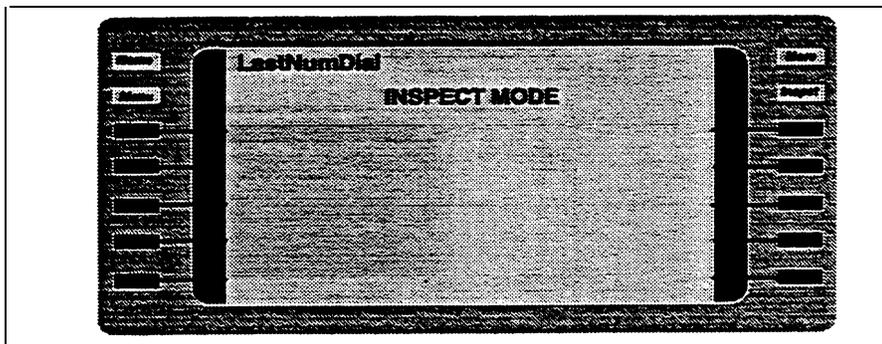
Figure 2-12   7-Line Display Inspect Screen for Programmed Button

Feature   Screen

The Feature screen provides quick access to commonly used features. When the user presses the Feature button, one of four Feature screens containing feature names appears on the display. The feature names correspond to what the user is doing. For example, when a user reaches a busy extension, the features that appear on the display include Leave Message, Callback, and Camp-On.

To select a feature, the user presses the button next to or below the feature name on the Feature screen. Once selected, the feature is activated unless more information is required. The user is then prompted to enter the information. For example, if the user chooses the Account Code Entry feature, the display prompts the user to enter the account code. Once the account code is entered correctly, the Feature screen clears and the Home screen is displayed.

Table 2-10 lists the features users see on the Feature screen depending on their current calling activity.

Table 2-10 Feature Screen Options

User's Telephone...	Feature Options	2x24 Display	7x24 Display
Is on-hook or has a dial tone on an inside line	Last Number Dial Pickup Group Pickup Loudspeaker Page Account Code Follow Me	Last# PkupG Pckup LdsPg Acct FlwMe	LastNumDial Pickup Grp Pickup Loudspkr Pg Account Code Follow Me
Has reached a busy extension	Callback Selective Barge-In Leave Message Camp-on	CbckS Barge LvMsg Camp	Cback Sel Barge In Leave Msg Camp On
Is ringing at an extension or Connected to an inside call	Have Message Barge-In Park Camp-on	LvMsg Barge Park Camp	Leave Msg Barge In Park Camp On
Is connected to an outside line	Last Number Dial Park Camp-on Account Code Follow Me	Lasts Park Camp Acct FlwMe	LastNumDial Park Camp On Account Code Follow Me

Notes

■ Loudspeaker Page only appears on the display if the system has a loudspeaker paging system, Barge-In only appears on system operator consoles, and Pickup Group only appears if the telephone is part of a Pickup group.

■ The Camp-On feature is shown when the user is connected to an outside line; however, the feature can be used only for inside calls.

■ The Park, Last Number Dial, and Callback features are not shown on any Feature screens on a QCC.

Analog Multiline Telephones

The BIS-22D and BIS-34D telephones have a 1-line by 16-character display. The MERLIN II System Display Console has a 2-line by 40-character display. The display offers the following:

■ Call-handling support—shows information such as telephone numbers as they are dialed, the name or number of callers, and the type of incoming call

■ Feature programming support—allows the user to inspect the contents of previously programmed buttons to determine the feature programmed

■ Feature use support—prompts the user to enter information (such as an account code) and allows the user to read messages from co-workers

■ Feature confirmation—confirms that a feature was activated successfully

■ Timekeeping functions—provide features such as an alarm clock and a built-in timer, and allow the user to set the time and date that appear on the display

Consideration

■ The date and time shown on MLX telephones is controlled by the processor
   module in the control unit. When the date or time changes, the control unit
   sends the message to MLX telephones one at a time, which can cause a
   different time and/or date to be displayed on each telephone.

Feature Interactions

Table 2-11 shows feature interactions and sample displays.

Table 2-11 Feature Interactions with Sample Displays

Feature/Function	Description	Analog Multiline Display	MLX Display
Account Code Entry	When a user activates the Account Code Entry feature, the display prompts the user to enter an account code.	`Acct:`	`Acct:`
	As the code is dialed, it appears on the screen next to the prompt.	`Acct: 12345b`	`Acct: 123456`
Alarm Clock	MLX telephone users program the Alarm Clock feature via the Menu screen. Analog multiline telephone users set the alarm by using the timekeeping buttons next to the display. Once the alarm is set on either type of telephone, a bell appears on the display next to the time.	`12:00p (bell)`	`05/06 12:00 (bell)`
	The telephone rings and the LEDs go off when Alarm is selected from the display. If the user is on a call and using the speakerphone, the speakerphone LED goes off and does not go back on when the user presses the Home button to return to normal call handling.		

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Auto Dial	When a user presses a programmed Auto Dial button, the digits appear on the display as if the user were dialing them from the dialpad; the number is automatically dialed. If the Stop character is the last character in the dial number it is not displayed when the user presses the Auto Dial button. The user must press the Auto Dial button again to complete dialing.	**5551234**	**5551234**
Barge-In	MLX telephone users see a message on the display when they activate Barge-In. If Barge-In is denied, an error message is not displayed on the calling telephone to indicate that the attempt was not successful.	n/a	**Barge In**
	The extension receiving the call also sees a message indicating who initiated the Barge-in call. The message does not time out and remains on the display until the person hangs up.	n/a	**Barge In: Sally**
Calendar	Analog multiline telephone users can set the time and date on their displays. The time and date on MLX telephones is controlled by the system time.	**12/01 3:00**	**12/01 3:00**

Table 2-11 Continued

Feature/Function	Description	Analog Multline Display	MLX Display
Callback	When a call is queued via Automatic Callback on MLX and analog multiline telephones or via Selective Callback on analog multiline telephones, the display shows a feedback message.	`Call is Queued`	`Queued Sally 1234` `Call Is Queued`
	When an MLX telephone user activates Selective Callback, the display prompts the user to enter the telephone number. After the number is dialed, the display provides the same feedback as on an Automatic Callback call.	n/a	`Dial Phone Number`
	When the queued call rings at the user's telephone, the display indicates that the call is a returning Callback call.	`Callback 1234`	`Callback Sally 1234`
Calling Restrictions	When a restricted MLX telephone user tries to dial a number that is restricted, the user sees a message on the display.	n/a	`Call Denied`
Call Waiting	When a user has a call waiting, a message appears on the display.	`Call waiting`	`Call Waiting`
Camp-On	After Camp-On is activated, the MLX display shows a feedback message.	n/a	`Camp-On: Sally`
	Only on a QCC are returning camped-on calls identified by call type and by the name and extension number of the person that the call was transferred to. The second line of the QCC display also shows the caller information.	n/a	`CampRet  Wayne x1234` `Caller: Sally x1235`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Conference	As with any other call, the dialed digits appear on line 1 of the display as a user sets up a conference call.	`1234`	`1234`
	On MLX telephones, line 1 of the display shows the number of conference participants.	n/a	`Conference: 4`

	In addition, the MLX telephone display prompts the user each time the Conf button is pressed to add a participant (the prompt disappears when the user selects the line). The display also prompts the user to drop a conference participant after the Drop button is pressed and then shows the updated conference information on line 1 and the dropped line or extension on line 2.	n/a	`Press Line Dial,`
			`Press Conf`
			
			`Drop: Select Party`
			
			`Conference: 3`
			`Sally Dropped`

Coverage	When a call is sent to Coverage, the person who answers the call sees a message on the display indicating who the call was intended for and the reason the call was sent to coverage:
	No answer
	Busy
	Do Not Disturb active
		`Cvr NoA Stephen`
		`Cvr Bsy Stephen`
		`Cvr DND Stephen`
			`Cover Stephen No An`
			`Cover Stephen Busy`
			`Cover Stephen DND`

	MLX telephone displays also show other reasons calls are sent to coverage: Invalid/unknown DID number Invalid/unknown Remote Access number	n/a n/a	`DID#?` `DISA#?`
	In addition, MLX telephones show the caller's information on the second page of the Home screen.	n/a	`Caller: FX-NYC Trk825`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Directory	Directories allow users to search for stored listings on the display and automatically dial the listing by pressing the corresponding button.	n/a	(For information, see Directory in this chapter.)
	All MLX telephone users have access to the Extension and System Directories. MLX-20L telephone users also can create a Personal Directory.		
	When a number is dialed via a Directory, the digits dialed are shown on line 1 of the display.		
	The telephone rings and the LEDs go off when Directory is selected from the display. If the user is on a call via the speakerphone, the speakerphone LED goes off; it remains off when the user presses the Home button to return to normal call handling.		
Direct Station Selector	When a system operator with one or two DSSs connected to an MLX telephone presses the Page button to change the range of extensions represented by the DSS button, a message appears that indicates the page number and the first extension number in the range.	n/a	`Page 1: 100`
	When the system operator presses the Message Status button to change the operation of the DSS to indicate the status of message-waiting LEDs on user's telephones, a message appears to indicate that the DSS is in Message Status operation.		`Message Status`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Do Not Disturb	When an MLX telephone user with Coverage activates Do Not Disturb and calls are sent to Coverage receivers, the receiver who answers the call sees a message showing that the call was redirected because the sender activated Do Not Disturb.	`Cov DND - Sally`	`Cover Stephen DND`

Follow Me	When Follow Me is activated or canceled, MLX telephone users see a prompt on the display followed by a confirmation message.	n/a
		
		n/a
			`Follow from:`
			`Cancel from:`
			
			`Signed IN: Sally`
			`Signed OUT: Sally`

	If the station from which calls are being forwarded is an MLX display telephone, the user sees a message to indicate that calls are being forwarded.	n/a	`Forward to: Wayne`
	If the MLX telephone user enters an invalid destination, the display clears. If the analog multiline user enters an invalid destination, an error message appears.	`Error`	n/a

Forward	When an MLX telephone user sets up Forward, the display prompts the user for the extension. After Forward is activated, the user sees a confirmation message.	n/a
		
		n/a
			`Forward to:`
			
			`Forward to: Wayne`

	A user receiving a forwarded call sees a message indicating who forwarded the call.	n/a	`Forward from Sally`
Continued	For outside calls, page 2 shows the line the call came in on and, if ANI is available, the caller's number.	n/a	`Outside 555-1234`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Forward, *continued*	For inside calls, page 2 shows the caller's name and extension.	n/a	`Caller: Pamela x1234`
	On MLX telephones, when a user forwards calls to an outside number (Remote Call Forward), the display prompts the user to enter the telephone number.	n/a	`Forward to:`
	On MLX and analog multiline telephones, the digits appear on the display as the user dials the outside number.	`12015551234`	`12015551234`
	MLX telephone users receive a feedback message showing that their calls are now forwarded to an outside number.	n/a	`Forward to:` `12015551234`
	If the MLX telephone user enters an invalid destination, the user hears a reorder tone.		
Group Calling	Calling group agents with an MLX telephone see feedback messages on the display when they log into the Available state.	n/a	`Available`
	When a calling group supervisor with an MLX telephone logs agents in or out, a message appears on the supervisor display and on the group member's display.	n/a	`Available` `Unavailable`
Continued	After pressing either the Available or Unavailable Status button or dialing the feature code, supervisors with MLX telephones are prompted to indicate which group member they want to log in or out.	n/a	`Select Agent to Log In` `Select Agent to Log Out`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Group Calling, *continued*	When a group member with an MLX telephone receives an outside call for the calling group, the type of call is identified on the display along with the label for the line the call came in on. If automatic number identification (ANI) is available, the number of the caller is shown on page 2 on MLX telephones. Analog multiline telephone users see only the line information.	`WATS`	`GrpC1 WATS` `GrpC1 WATS 555-1234`
	Any MLX telephone user can inspect the number of calls in queue by pressing Inspect and then pressing a button programmed with the calling group's extension. The display shows the label associated with the calling group and the number of calls.	n/a	`Group Call Sales 12`
Hold	When a user with an MLX telephone has a call on hold for a longer period of time than the programmed Hold Reminder, a message appears on the display.	n/a	`Call On Hold`
	Only on a QCC, when held calls return to the queue after the second hold reminder, returning held calls are identified by call type and by the name and extension number of the system operator who put the call on hold. The second line of the QCC display also shows the caller information.	n/a	`HoldRet Wayne x10` `Caller: Sally x1235`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Inspect	MLX telephone users can inspect the contents of programmed buttons by pressing Inspect and then pressing the programmed button. The display shows the feature or line assigned to the button.	n/a	`Account Code`

	Users can also inspect incoming calls or calls they have put on hold. The display shows standard call information (see "Receiving Calls" in this table). If a user inspects a line that someone else is using, the display shows that the line is in use.	n/a
		
		n/a
			`FX-NYC (outside)`
			`Stephen x1234 (inside)`
			
			`In Use`

Last Number Dial	When a user presses a programmed last Number Dial button, the digits appear on the display as if the user were dialing them from the dialpad.	`5551234`	`5551234`
Making Calls	When a user makes a call, the digits appear on the display as they are dialed by using the dialpad or using any of the quick dialing features (Auto Dial, Speed Dial, Directory, Last Number Dial, or Saved Number Dial).	`1234`	`1234`
	If the user dials an extension and labels are programmed, the name is displayed after all the digits are entered.	`Stephen`	`Stephen`
Continued	**Note:** If a user calls an extension and the person at that extension transfers the call, the first user's display is not updated with the number where the call was transferred. Similarly, in the Hybrid/PBX mode, if a user calls an extension and the call is answered at a Shared System Access button, the display shows the principal's extension and not the answering extension.		

Table 2-11 Continued

Feature/Function	Desccription	Analog Multiline Display	MLX Display
Making Calls, *continued*	If a user dials 0 to reach the system operator or, in the Hybrid/PBX mode, dials the listed directory number (the QCC queue extension), the display identifies the number as the system operator. When the call is sent immediately to a system operator without going through the QCC queue, the extension or label for the system operator receiving the call is shown instead.	`Operatr`	`Operatr`
	When a user goes off-hook on a line or pool button, the display shows the label (if programmed) for the line or pool that was selected. On MLX telephones, this information remains on the display. On analog multiline telephones, the line label is erased when the user begins dialing. If the user dials more than 15 digits on an MLX telephone and more than 16 digits on an analog multiline telephone, the remaining digits are shown on page 2.	`5551234`	`FX-NYC 5551234`
Messaging	When users try to send a message to a telephone whose message box is full, they see a feedback message on the display.	`Message Box Full`	`Message Box Full`
	When a user tries to retrieve messages and the message box is empty, a message appears to indicate there are no messages.	`No Messages`	`No Messages`
Continued	When a user has a message, the display shows the name or extension number (if no alpha label is programmed) of the caller and, on MLX telephones, the time and date the message was left. Messages can be sent by co-workers and by outside callers if the telephone has voice mail, by the system operator, or by a fax machine.		

Table 2-11 Continued

Featur/Function	Description	Analog Multiline Display	MLX Display
Messaging, *continued*	For each type of message, the display indicates the sender of the message. On MLX telephones, an unread message is marked with an asterisk (*). On analog multiline telephones, an unread message is also marked with an asterisk, but no message information is shown. **Note:** The type of message does not allow a calling group message-waiting receiver to distinguish between a message left for the calling group and a fax or personal message.		
	Unread message	*	`Wilma 10:43 (p. 1)` `06/15 x7846 (p. 2)`
	Co-worker	`Call Joe`	`*Joe 11:03 (p. 1)` `06/15 x 1625 (p. 2)`
	Voice Mail Message	`V`	`VMS 11:03 (p. 1)` `06/15 x1234 (p. 2)`
	System Operator	`A`	`ATT OPERATR 11:03 (p.1)` `06/15 x1223 (p. 2)`
	Fax	`F`	`FAX 11:03 (p. 1)` `06/15 x1236 (p. 2)`
	Users with display telephones who call an extension with a Posted Message see the message on their displays.	`AT HOME`	`AT HOME`
Night Service	When a system operator with an MLX telephone activates Night Service by using a programmed button, a message appears on the display.	n/a	`Night Service ON`
Continued	If the system operator must enter a password to turn Night Service on and off, the display prompts the operator for the password.	n/a	`Enter Password:`

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display
Night Service, *continued*	No message is displayed when the system operator activates Night Service by using a feature code or when Night Service is off.		
Paging	When they use Group Page, users with MLX telephones see a message on the display indicating the number of the paging group.	n/a	`Paging 6`

Park	On QCCs, returning parked calls are identified by call type and the name or extension number of the system operator who parked the call. The second line of the QCC display also shows the caller information.	n/a	`ParkRet Wayne`
			
			`Caller: Sally x1235`

Pickup	When a user with an MLX telephone activates Pickup, a prompt appears on the display. (The prompt is not displayed if a button programmed for a specific line or extension is used.)	n/a	`Pickup Line/Ext:`
	After the user enters the line or extension number to pick up the call, a confirmation message is displayed.	n/a	`Pickup: Outside` `Pickup: Joe`
Program Mode	When analog multiline telephone users enter program mode, they see a message on the display. MLX telephone users see the first Extension Programming screen.	`Program Mode`	`Extension Program 10` `(HOME to Exit) Start`

	If the user presses a button that is already programmed, the name of the feature appears on the display. If the button is not programmed, the display shows that the button is blank.	`Camp On`
		
		`Blank`
			`Camp On`
			
			`Blank`

Continued	Any digits dialed during programming appear on the display on analog multiline telephones.	`5551234`	n/a

Table 2-11 Continued

Feature/Function	Description	Analog Multiline Display	MLX Display

Program Mode, *continued*	Status feedback messages are shown on analog multiline telephones when features that affect telephone operation are programmed. Status messages are not shown on MLX telephones.
	
	(For more on Extension Programming, see Appendix B, General Telephone Programming Instructions.)
		`Voice announce On/Off`
		
		`Call Waiting On/Off`
		
		`Automatic Callback On/Off`
		
		`Shared SA Ring On/Off`
		
		`Abbreviated Ring On/Off`
		
		`Coverage Inside On/Off`
			n/a

Recall	When an MLX telephone user presses a programmed Recall button while on an outside line, the line information is re-displayed just as if the user had gone off-hook on the line.	n/a	`FX-NYC`

Receiving Calls	For inside calls, the display shows the name of the caller (if labels have been programmed) and/or the extension number. On analog multiline telephones, the display also shows if the call is a voice (V) call or a ringing (R) call.
	
	For outside calls, the display shows the line the call came in on. If automatic number identification (ANI) is available, the number of the caller is shown on page 2 on MLX telephones. This information is provided for transferred, forwarded, calling group, and incoming calls.
	
	Note: For calls received on tie trunks, the display shows information only if the user preselects the button.
		`Sally - Ext R`
		
		`FX-NYC`
		n/a
			`Sally - X1234`
			
			`FX-NYC`
			`FX-NYC 5551234`

Continued

Table 2-11 Continued

Feature/Function	Description	Analog Mutiline Display	MLX Display

Receiving Calls, *continued*	For certain types of incoming calls, the display also shows the type:
	Transfer
	Return from Transfer
	Coverage
	Forwarded
	Returning Callback
	Group Calling
		`TransferReceive`
		`TrfRet -`
		`Cvr`
		`Forward`
		`Callbck`
		n/a
			`Transfr`
			`Return`
			`Cover`
			`Forward`
			`Callbck`
			`GrpCl`

Remote Access	Calls received via Remote Access show standard call information for outside calls, including the caller's number if automatic number identification (ANI) is available.	`WATS Trk 825`	`WATS Trk 9999` `WATS 555-1234`
	If a Remote Access call is sent to Coverage because an invalid number was dialed, an MLX telephone user who receives the call sees a message.	n/a	`Cover DISA#?`
Saved Number Dial	When a user dials a number by pressing a programmed Saved Number Dial button, the digits appear on the display as if the user were dialing them from the dialpad.	`5551234`	`5551234`
Timer	Display telephones have a built-in timer that allows the user to time telephone calls or other events. The timer appears on the second line of the display and counts to 59 minutes and 59 seconds, then resets to zero and continues counting.	`39:15`	`39:15`
Transfer *Continued*	When an MLX telephone user presses Transfer, the display prompts the user to dial the extension number.	n/a	`Transfer To: ?`

Table 2-11 Continued

Feature/Function	Description	Analog Mutiline Display	MLX Display

Transfer, *continued*	The display shows the digits as they are dialed. When all digits are entered, the display shows the name of the person if labels are programmed.	`1234`
		
		n/a
			`1234`
			
			`Joe x1234`

	Calls returning from transfer are identified by call type and by the name and extension number the call was transferred to. The second line of the MLX telephone display also shows the caller information.	`TrfRet-Wayne`
		
		n/a
			`Return Joe x1234`
			
			`Caller: Sally x1235`

	When an MLX telephone user receives a transferred call, the display shows the type of call and the caller information on line 1. When an inside call is being transferred, the extension number or name is shown. When an outside call is being transferred, the line the call came in on or the caller's telephone number (if ANI is available) is shown. The transfer originator is shown on line 2.	n/a	`Transfr Sally`
			`Transfr by Sue`
			
			`Transfr 555-1212`
			`Transfr by Sue`

	When an MLX telephone user does not complete a transfer, for example, because Do Not Disturb is activated at the destination extension, the call returns to the user's telephone and call information is displayed. The reason for the incomplete transfer is not indicated.	n/a	`Incomplete Transfer` `Caller: Sally x1235`

Do Not Disturb

Extension Programming

Programming Code: *47
MLX Display Label: DoNotDisturb [DND]

Description

Do Not Disturb prevents calls from ringing and prevents paging over a user's speakerphone. When the feature is activated and the user receives an outside call, the caller hears ringback, but the telephone does not ring. The green LED next to the line button with the ringing call flashes to indicate an incoming call, and, if the user chooses, the call can be answered. If the feature is activated and the user receives an inside call, the inside caller hears a busy signal. The user's telephone does not ring, and the green LED next to an Intercom or System Access button does not flash.

When Do Not Disturb is activated, the telephone rings and the green LED next to the button flashes for the following priority calls:

■ A call from a receiver with a Primary Cover or Secondary button programmed for the user

■ A call from another person using the Barge-In feature to alert the user to emergencies or other urgent situations

■ A returning transferred, camped-on, or parked (DLC only) call

■ A Callback call that notifies the user who activated the Callback feature that a call to a busy extension or to a busy pool (Hybrid/PBX only) can be completed

Telephone Differences

Queued Call Console

Do Not Disturb cannot be used on a QCC.

All Other Multiline Telephones

All other multiline telephone users activate Do Not Disturb by pressing the programmed Do Not Disturb button. The green LED next to the button goes on to indicate the feature is active. To deactivate the feature, the user presses the programmed Do Not Disturb button again. The green LED next to the button goes off to indicate the feature is deactivated.

Feature codes cannot be used to activate and deactivate Do Not Disturb. An MLX telephone user can select the feature from the display only during programming.

Single-Line Telephones

Users at single-line telephones cannot use Do Not Disturb.

Considerations

■ Do Not Disturb must be programmed onto an available button.

■ If a user activates Do Not Disturb while receiving a call (either ringing or voice announced), the call continues to ring (or voice announce). The Do Not Disturb feature is, however, activated for the next call received.

■ When Do Not Disturb is activated, a user's calls ring at other telephones with shared outside line or System Access buttons or at Coverage receivers.

Feature Interactions

Auto Dial

When a user activates Do Not Disturb, the green LED goes on next to all Auto Dial buttons programmed with the user's extension.

Barge-In

If Do Not Disturb is activated, Barge-In overrides the feature and makes the telephone ring.

Callback

Calls to a user with Do Not Disturb activated are not eligible for Callback queuing. If the Callback originator is using Do Not Disturb, the system overrides the feature and the telephone rings when the busy extension or trunk is available.

Camp-on

A Camp-On call does not ring when Do Not Disturb is activated.

Coverage

When a sender activates Do Not Disturb, calls go to individual and/or Group Coverage receivers. Individual and/or Group Coverage calls are not sent to a receiver with Do Not Disturb activated. If both a sender and all receivers have Do Not Disturb activated, the call is not sent to Coverage and the caller hears a busy tone.

If a sender in a coverage group activates Do Not Disturb and one of the coverage group receivers calls the sender, the call rings on the sender's telephone.

Direct-Line Console

The green LED next to an Auto Dial or DSS button on a DLC goes on when a user activates Do Not Disturb.

Display

When an MLX telephone user with Coverage activates Do Not Disturb and calls are sent to coverage receivers, the receiver who answers the call sees a message showing that call was redirected because the sender activated Do Not Disturb.

If an MLX display telephone user tries to transfer a call to another with Do Not Disturb active, the display shows "Incomplete Transfer."

Forward and Follow Me   Calls are not fowarded to a user who has Do Not Disturb active; the call rings at the forwarding telephone. Activating Do Not Disturb at the forwarding telephone does not prevent calls from being forwarded.

Group Calling   If a calling group member uses Do Not Disturb, calls are not sent to the group member even if he or she is logged in and available.

Headset Options   If an MLX telephone user with Headset Auto Answer uses Do Not Disturb, any calls that override Do Not Disturb (such as Barge-In calls and Callback calls) are automatically answered.

Multi-Function Module   Using Do Not Disturb is not recommended since the device connected to the MFM does not have an LED to indicate when the feature is active.

Paging   Speakerphone paging calls cannot be made to a telephone with the Do Not Disturb feature activated.

Queued Call Console   Do Not Disturb cannot be used on a QCC; Position Busy must be used instead. The green LED next to a DSS button goes on when a user activates Do Not Disturb to indicate that the user is not available.

Reminder Service   Reminder calls ring at telephones with Do Not Disturb activated.

Signaling   Signaling cannot be used when the destination telephone user activates Do Not Disturb.

System Access   Do Not Disturb prevents ringing of incoming calls at Intercom or System Access buttons (including Shared System Access buttons) on the telephone where the feature is activated. In the Hybrid/PBX mode, this also prevents calls received on the principal's System Access button from ringing at other telephones with Shared System Access buttons.

Transfer   Calls transferred to telephones that have Do Not Disturb activated are returned after the Transfer Return Interval expires unless the telephone has a Call Coverage arrangement and a receiver is available. In that case, the transferred call is redirected to the receivers like any other call.

Voice Announce to Busy   A user with Do Not Disturb active does not receive voice announcements.

Related Features

■ Coverage On/Off

■ Queued Call Console-Position Busy

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Extension Status

Extension Programming

Programming Code:
  Direct Line Console:
   Status 0: *760
   Status 1: *761
   Status 2: *762
   Telephones (rooms or agents):
   Status 1:   *45
   Status 2:   *44
  Feature Code:
  Direct-Line Console:
   Status 0: 760 + DSS
   Status 1: 761 + DSS
   Status 2: 62 + DSS

  Telephones (rooms or agents):
   Status Off: *44
   Status 1:   5
   Statusd 2:   44
  MLX Display Label:
   Status 0: ES Status, ES off [ES, ESOff]
   Status 1: ES Status, ES1 [ES, ES1]
   Status 2: ES STatus, ES2 [ES, ES2]

Description

See "Direct Station Selector" for details on the use of a DSS adjunct for Extension status.

Extension Status can be used by a system operator or a calling group or Call Management System (CMS) supervisor with a direct-line console (DLC). Extension Status allows the system operator or supervisor to use the LEDs on a DLC to monitor the status of extensions differently from the standard call-handling status of available, busy, and Do Not Disturb. The red LEDs next to DSS (Direct Station Selector) buttons or the green LEDs next to Auto Dial buttons programmed with extension numbers are on, off, or flashing, depending on the extension's status.

The two configurations for Extension Status that can be selected during system programming and the status indicated by the LEDs are as follows:

The hotel or motel configuration may assign different meanings to the three extension states.

■ **Hotel.** Employees at the front desk at a hotel or motel can use Extension Status to monitor room availability and to restrict the telephones when the rooms are not occupied. The status and the LED indication can be one of the following:

■ **Status 0—LED is off.** Room is occupied and telephone is in regular call-handling state.

■ **Status 1—LED is flashing.** Room is unoccupied and ready for cleaning; outside calls cannot be made from the telephone.

■ **Status 2—LED is on.** Room is vacant and outside calls cannot be made from the telephone.

See Chapter 3 for more on CMS.

■ **Group Calling/CMS.** A calling group or CMS supervisor can use Extension Status to monitor the availability of agents who can take calls directed to the calling group. The status and LED indication can be one of the following:

■ **Status 0—LED is off.** Telephone is signed out from the group and the member is unavailable to take calls.

■ **Status 2—LED is on.** Telephone is signed into the group; calls can be sent to the group member.

■ **Status 1—LED is flashing.** Used for CMS only. Telephone is in the "After Call Work" state; group member is unavailable to take calls.

In either the hotel or Group Calling/CMS configuration, a system operator or a calling group or CMS supervisor with a DLC can change the status of an extension by either using a programmed button or pressing the Feature button and dialing a code. In addition, users with any type of telephone can change to Status 1 and Status 2.

In the Group Calling/CMS configuration, users can change sign-into the group by changing to status 0; however, in the hotel configuration, an extension can be changed to status 0 only from a DLC.

Telephone Differences

Multiline Telephones

Only a telephone assigned as a DLC can activate Extension Status to see the status of telephones. In the Hotel configuration, the feature is assigned to the console in system programming and is always active on the console unless the system operator presses the Message Status button to use the Auto Dial or DSS buttons to see message-waiting status for each telephone.

To activate Extension Status in the Calling Group/CMS configuration, the calling group or CMS supervisor assigned as a DLC presses the Feature button, dials 32, and presses the Hold button. To deactivate the feature and return to normal call handling, the supervisor presses the Feature button, dials 32, and presses the Drop button.

To change the status of a telephone, the system operator or supervisor activates Extension Status (if not already active) and then presses a programmed button for status 0, status 1, or status 2, and the Auto Dial or DSS button for the telephone. The system operator or supervisor can also change the status of telephones by pressing the Feature button, dialing the feature code (760 for status 0, 761 for status 1, and 762 for status 2), and pressing the Auto Dial or DSS button for the telephone.

Note: MLX display telephone users see only the first three characters dialed (for example, F76) when changing the status of telephones.

In either the hotel or calling group/CMS configuration, regular multiline telephone users can change to status 1 or 2 by pressing a programmed button for each state or by pressing the Feature button and dialing the feature code (45 for status 1 or 44 for status 2). In the calling group/CMS configuration only, the user can change to status 0 by pressing the Feature button and dialing *44.

Single-Line Telephones   A single-line telephone user can change to status 1 or status 2 lifting the handset, which must be connected to an Intercom or System Access line, and dialing #45 for status 1 or #44 for status 2. In the calling group/CMS configuration only, the user can change to status 0 by dialing #*44.

Considerations

- The system can be setup for either Hotel or Calling Group/CMS configuration, but not for both in the same system.

- In the hotel configuration, when DSS buttons are used to monitor status, system operators can use the Message Status button to see whether a system operator turned on message LEDs at the telephones. In the calling group configuration, Message Status shows the busy/not busy status of the telephones.

See "Direct Station Selector" in this chapter for details on assigning"a range of extensions to Page buttons on a DSS adjunct.

- Since the built-in DSS field of a MERLIN II System Display Console corresponds to station jacks instead of to a range of extensions assigned to Page buttons in system programming as with a DSS adjunct, it is recommended that it be used for Extension Status in hotels with more than three floors. The status of the first 120 rooms is displayed, and if the hotel has more than 120 rooms, Auto Dial buttons can be assigned to up to 33 line buttons on the console to be used for Extension Status and for transferring calls to the rooms.

- While in supervisor Extension Status, MLX display telephone users see only the first three characters dialed (for example, F76) when changing the status of telephones.

- In the hotel configuration, when Auto Dial buttons are used to monitor the status of telephones (instead of buttons on a DSS), the green LED next to the button indicates extension status (0, 1, or, 2) and the red LED indicates message status. In the calling group configuration, the green LED also indicates extension status, but the red LED indicates busy/not busy status.

- If the system is programmed for Extension Status in the hotel configuration, telephones can be changed to status 0 (regular call handling) only from the system operator console.

- Extension status cannot be changed from rotary telephones.

- In the hotel configuration, when the system restarts (for example, for maintenance) and the calling group type is set for Auto Logout (see Group Calling for details), stations that are assigned status 1 are automatically changed to status 0 and restrictions are removed. If the calling group type is changed to Auto Login, stations assigned status 1 are automatically changed to status 2 and restrictions remain.

Feature Interactions

Allowed Lists and Calling Restrictions   To allow users in the hotel/motel configuration to dial emergency or other selected numbers when the telephone is in status 1 or 2, access must be assigned to an Allowed List.

Callback	In the hotel/motel configuration, a station in ES state 1 or 2 cannot use Callback to request busy pools.
Direct-Line Console	Extension Status can be assigned to DLCs only. In the hotel configuration, only a DLC system operator can change an extension to status 0. to the Group Calling/CMS configuration, a calling group or CMS supervisor uses a DLC to monitor and change group member status.
Direct Station Selection	A calling group or CMS supervisor or a DLC console with Extension Status assigned can change the status of a group member or room by pressing a programmed Available or Unavailable Extension Status button and then pressing the DSS button for the group member or room. See "Direct Station Selector" in this chapter for a complete description of the use of a DSS adjunct and the meaning of LEDs for Extension Status.
Do Not Disturb	The LED next to an Auto Dial or DSS button is on when the user activates Do Not Disturb or is busy on a call. The system operator cannot distinguish between the two states.
Group Calling	Extension Status allows calling group supervisors to change and monitor calling group member status and to enable group members to sign in and out of the calling group.
Queued Call Console	Extension Status cannot be used on a QCC, and a QCC cannot be a calling group or CMS supervisor console or a calling group member.

System Programming

■ Designated either hotel or calling group/CMS configuration.

   Optionals -> Ext Status

■ Assign DLC system operator position.

   Operator -> Positions -> Direct Line

■ In the hotel configuration, activate Extension Status on the DLC.

   Extensions -> More -> Ext Status

Related Features

■ Calling Groups

■ Calling Restrictions

Forced Account Code Entry

Extension Programming

> **Account Code Entry:**
> **Programming Code:** *82
> **Feature Code: 82 + Code**
> **MLX DisplayLabel: AccountCode [Acct]**

Description

When assigned to an extension, Forced Account Code Entry requires the user to enter an account code before dialing an outside call. The account codes are included on Station Message Detail Recording (SMDR) reports along with other call information. The codes are used for billing and accounting purposes to associate outgoing calls with a project, client, or department.

When Forced Account Code Entry is assigned to a telephone, the user must begin each outgoing call by activating the Account Code Entry feature, entering the account code, and completing the entry. When the entry is completed, the user can proceed with the call.

If a user tries to select an outside line on a System Access button (by dialing a dial-out code) or on an Intercom button (by dialing the Idle Line Preference code, usually a 9) without entering an account code, the user hears an intercept tone and must hang up and begin again. If the user tries to make an outside call on a personal line, outside line, or Pool button without entering the account code, the telephone loses its dial tone.

A user can change an account code during a call but cannot remove the account code. To change a previously entered account code, the user activates the feature, enters the account code, and completes the entry. The called party cannot hear the tones. If the user tries to remove an account code, no change is made to the account code already entered. However, no indication is provided to the user that nothing was changed.

Telephone Differences

Queued Call Console

On QCCs, Account Code Entry is activated by selecting the feature from the Home screen or by pressing the Feature button and selecting the feature from the display. After the account code is dialed, the entry is completed by dialing a #.

To make another outgoing call while on a call, the system operator puts the first call on hold, activates Account Code Entry, dials the account code, completes the entry, and selects the Call button on which to make the call.

Multiline Telephones

0n all other multiline telephones, Account Code Entry is activated by pressing a programmed Account Code button or by pressing the Feature button and dialing 82. After the account code is dialed, the entry is completed by pressing a programmed Account Code Entry button or dialing #. On MLX display telephones, the feature can also be activated and completed by pressing the Feature button and selecting the feature from the display. Once the entry is completed, the user can select a System Access, Personal Line, or Pool button, lift the handset, and make the call.

Note: If the multiline telephone user completes the entry by dialing a #, account codes cannot be entered with System Speed Dial or Personal Speed Dial, since the # is used to complete the entry and cannot also be used to activate Speed Dial.

To make another outgoing call while on a call, the system operator puts the first call on hold, activates Account Code Entry, dials the account code, completes the entry, and selects the System Access, Personal Line or Pool button on which to make the call.

When Account Code Entry is assigned to a button, the feature is automatically activated and the green LED next to the button flashes when the handset is lifted and a Personal Line, or Pool button is selected for an outgoing call. On MLX display telephones, the feature name is shown on the display to indicate that the feature is activated. The user can then enter the account code, press the Account Code Entry button (the green LED is steady), select the outside line, and proceed with the call.

Single-Line Telephones

To enter an account code, the single-line telephone user must be listening to internal dial tone. The feature is activated before a call by dialing #82, and the entry is completed by dialing #. To change an account code previously entered, the single-line user must put the caller on hold and obtain an internal dial tone before activating and competing the feature.

Single-Line telephones must have touch-tone dialing to activate the feature and must be programmed through Idle Line Preference to select a System Access or intercom button when the user lifts the handset.

Single-line telephone users cannot enter account codes with System Speed Dial or Personal Speed Dial since the # is used to complete the entry and cannot also be used to activate Speed Dial.

Considerations

■ Forced Account Code Entry applies only to outside calls that a user originates. A user can answer incoming calls, add outside calls to a conference call, and join call on shared lines without entering an account code.

■ The programmed Account Code button works only to activate and complete the account code entry. To enter account code by using a button, a separate Auto Dial button must be programmed.

■ Account codes can be entered for incoming calls and for calls added to a conference call by using the Account Code Entry feature, except for incoming calls received on a Cover button. Account codes must be entered at the sender's telephone for coverage calls.

■ Users cannot change an account code that was entered at another telephone.

■ Account codes can be changed or corrected during a call but cannot be canceled.

■ When an account code is entered during a call, the caller cannot hear the tones.

■ One to sixteen characters consisting of the digits 0-9 and * are allowed for account codes. Other special characters are not allowed. If a user enters more than 16 characters when entering an account code, the extra characters are ignored by the system.

■ The system does not validate account codes; it only cheeks for the number of characters entered (maximum 16) and for completion (dialing # or pressing an Account Code Entry display or feature button).

Feature Interactions

Auto Dial   Frequently used account code numbers can be programmed onto outside Auto Dial buttons.

Automatic Line Selection   Account codes can be entered by a single-line telephone user only when the Automatic Line Selection is programmed to select a System Access or Intercom button when the user lifts the handset.

Automatic Route Selection   If Forced Account Code Entry is assigned to the telephone, the user must enter the code before dialing the ARS dial-out code.

Callback   An account code must be entered before Callback is activated. if not, the user hears a busy tone.

Conference   A separate account code must be entered for each outside call added to the conference.

Directory   An MLX-20L telephone user can program account codes either individually or with a telephone number in a Personal Directory listing. However, the user must lift the handset or press the Speakerphone button before selecting the listing from the display.

Display	When a user selects an outside line, the display prompts the user to enter an account code. As the code is dialed, it appears on the screen next to the "Acct:" prompt.
Forward and Follow Me	Telephones with Forced Account Code Entry assigned can forward calls only to extensions and not to outside telephone numbers. The user hears a fast busy signal when trying to forward calls to an outside telephone number.
Personal Lines Pools	When Forced Account Entry is assigned to a telephone and the user tries to dial an outside call on a Personal Line or Pool button without entering the account code, the telephone loses its dial tone.
Queued Call Console	Forced Account Code Entry can be assigned to a QCC. However, Account Code Entry can be used to enter codes for outside calls only by selecting the feature from the display and not through the use of feature codes.
Remote Access	Forced Account Code Entry cannot be assigned to Remote Access users.
Speed Dial	Multiline telephone users who use a programmed Acoount Code button or display telephone users who select the feature from the display can use Personal Speed Dial and System Speed Dial to dial account codes. Single-line telephone users and multiline telephone users who complete the entry by dialing a # cannot use Personal Speed Dial or System Speed Dial to dial account codes since the # required to use Speed Dial is also used to complete Account Code Entry.
Station Message Detail Recording	The account code is printed in the "Account" field of the SMDR record.
Transfer	When a call is transferred, the destination extension cannot enter an account code to overwrite the account code entered at the originating telephone.

System Programming

■ Assign Forced Account Code Entry to individual extensions.

> Extensions -> Account

Hardware Requirements

An RS-232-compatible, 80-column serial printer or other device is needed to output SMDR account code reports.

Related Features

■ Account Code Entry

■ Station Message Detail Recording (SMDR)

Forward and Follow Me

Extension Programming

Activate Forward and Remote Call Forward

Programming Code:	***33**
Feature Code:	**33 + extension number**
	or dial out code and telephone number
MLX Display Label:	**Forward [Forwd]**

Activate Follow Me

Feature Code:	**34 + extension number**
MLX Display Label:	**Follow Me [FlwMe]**

Cancel Forward Remote Call Forward and Follow Me

Feature Code:
At originating station:	***33 + own ext no.**
At destination station	
When originating ext known :	***34 + ext no.**
When originating ext.	
not known or to cancel all:	***34***
MLX Display Label:	**CanclFollow (QCC only)**

Description

Forward and Follow Me provide two different ways for users who are away from their telephones to send calls to another number. For example, a user can receive calls while temporarily located elsewhere in the building by forwarding calls to another extension. Or a user can receive calls while working at home by forwarding calls to an outside number. When calls are forwarded to an outside telephone number, the feature is called Remote Call Forward.

Note: Calls forwarded to outside telephone numbers may vary in transmission quality.

The feature used is determined by where the user is located:

■ Forward and Remote Call Forward are used from the person's own telephone or from an outside telephone via Remote Access.

■ Follow Me is used when the person is at another location in the system and wants incoming calls to be sent to that extension. Follow Me can be used to forward calls only to extensions and not outside telephone numbers.

All users except QCC system operators can use Forward or Follow Me to forward calls to another extension; this capability cannot be changed in system programming. However, the factory setting for Remote Call Forward is that users are not allowed to forward calls to outside numbers. This capability must be assigned to individual extensions through system programming.

The following types of calls are forwarded by using Forward, Remote Call Forward, or Follow Me:

■ Ringing inside calls

■ Transferred calls from another user or from a system operator

■ Outside calls received on a tie trunk that are directed to the extension

■ Outside calls received on a Direct Inward Dial (DID) trunk (Hybrid/PBX only)

Calls received on a personal line (an outside line assigned to a button on the telephone) are forwarded to outside numbers with Remote Call Forward only under the following circumstances:

■ The extension is programmed as the principal user of the personal line in system programming. Only one extension can be the principal user for each individual line/trunk.

   Note: Assigning an extension as the principal user of a personal line also specifies that the calls received on the personal line follow that person's Individual or Group Coverage patterns unless the personal line is set to No Ring.

■ The personal line is a loop-start line/trunk with a "reliable" disconnect signal. A disconnect signal is the signal sent by the local telephone company which notifies the system that the outside caller hung up. The factory setting for loop-start line/trunk disconnect reliability is "unreliable." This can be changed in system programming to "reliable." A disconnect signal is considered reliable when the local telephone company sends a disconnect signal on every call when the outside caller hangs up and is considered unreliable when the local telephone company does not send a disconnect signal on every call. Remote Call Forward cannot be used to forward calls to outside numbers when the disconnect signal is unreliable.

   Note: The reliable disconnect setting cannot be programmed for T1 channels that are programmed to emulate loop-start lines/trunks. When Remote Call Forward is used, calls received on these types of lines/trunks are forwarded to the primary system operator instead of to the outside telephone number.

The following types of calls are not forwarded by using Forward, Remote Call Forward or Follow Me:

■ Voice-announced inside calls

■ Calls received on a Cover button

■ Group Calling calls—An available calling group member is automatically logged out when the member forwards calls to an extension or outside telephone number. If a calling group member logs in while calls are being forwarded, Forward or Remote Call Forward is automatically canceled.

■ Returning parked or transferred calls

■ Callback calls from the system

■ Calls received on a Shared System Access button

■ Calls received on a Call button on a QCC

On multiline telephones, a call forwarded to an extension rings once at the forwarding telephone and also rings at an available System Access or Intercom button at the destination extension. The green LED next to the button on the forwarding telephone continues to flash, and the call can still be answered at the forwarding telephone.

On a single-line telephone, a call forwarded to an extension rings on both the forwarding telephone and the destination extension until the call is answered or sent to coverage.

On both multiline and single-line telephones, a call forwarded to an outside telephone number does not ring at the forwarding telephone.

Telephone Differences

Queued Call Console

Forward and Remote Call Forward cannot be used to forward calls from a QCC. However, users can forward calls to an individual QCC.

To use Follow Me to receive forwarded calls from another extension, the QCC system operator presses the Feature button, selects Follow Me from the display, and at the prompt dials the extension of the forwarding telephone.

To cancel Forward and Follow Me calls being received at the destination QCC:

■ When the extension number of the forwarding station is known, the QCC system operator presses the Feature button, selects Cancel Follow Me **(Cancl Follow)** from the display, and dials the forwarding station's extension number.

■ When all call forwarding is to be canceled or when the extension number of the forwarding station is not known, the QCC system operator presses the Feature button, selects Cancel Follow Me **(Cancl Follow)** from the display, and dials ***.**

All Other Multiline Telephones

On all other multiline telephones, to forward calls to an extension, the user presses a programmed Forward button and dials the destination extension number; or presses the Feature button, dials 33, and dials the destination extension number.

To forward calls to an outside telephone number, the user presses a programmed Forward button or presses the Feature button and dials 33. The user then selects the outside line/trunk or pool on which to route the call by dialing the Automatic Route Selection (ARS) or pool dial-out code (Hybrid/PBX onl), the Idle Line access code (9 - for Key and Behind Switch only), or the line/trunk number (801-880). After selecting the outside line/trunk or pool the user dials the destination telephone number followed by a # to signal the end of the dialing sequence.

The user who is off-hook hears a confirmation tone (double break in dial tone) after dialing the extension number or the outside telephone number and #. If a programmed Forward button is used, the green LED next to the button goes on to indicate that calls are being forwarded.

To use Follow Me to receive forwarded calls from another extension, the multiline telephone user presses the Feature button, dials 34, and dials the forwarding telephone's extension; the user hears a confirmation tone. An MLX display telephone user can also use Follow Me by pressing the Feature button, selecting the feature from the display, and dialing the forwarding telephone's extension.

To cancel Forward, Remote Call Forward, and Follow Me, at the originating multiline telephone, the user presses the programmed Forward button or presses the Feature button, dials 33, and dials his or her own extension number. The user hears a confirmation tone, and if a programmed Forward button is used, the green LED next to the button goes off.

To cancel forwarded calls being received at the destination multiline telephone:

■ When the forwarding station's extension number is known, the multiline telephone user presses the Feature button, dials *34, and dials the forwarding station's extension number.

■ When all calls forwarded to the destination extension are to be canceled or when the forwarding station's extension number is not known, the multiline telephone user presses the Feature button and dials *34*.

Single-Line Telephones

To forward calls to an extension by using a single-line telephone, the user lifts the handset (must be listening to internal dial tone) and dials #33 and the destination extension number.

To forward calls to an outside telephone number, the user lifts the handset (must be listening to internal dial tone) and dials #33. The user then selects the outside line/trunk or pool on which to forward the call by dialing the ARS or pool dial-out code (Hybrid/PBX only), the Idle Line access code (9 - for Key and Behind Switch only), or the line/trunk number (801-880). After selecting the outside line/trunk or pool, the user dials the destination telephone number followed by a # to signal the end of the dialing sequence.

The user hears a confirmation tone (double break in dial tone) after dialing the extension number or outside telephone number to indicate that call is are being forwarded.

To forward calls to an extension by using Follow Me when the destination is a single-line telephone, the user lifts the handset, hears internal dial tone, and dials #34 and his or her extension. The user hears a confirmation tone.

To cancel Forward, Remote Call Forward, and Follow Me at the originating single-line telephone, the user dials #33 and dials his or her own extension number. The user hears a confirmation tone.

To cancel forwarded calls being received at the destination single-line telephone:

■ When the forwarding station's extension number is known, the user dials #*34 followed by the originating station's extension number.

■ When all calls fowarded to the destination extension are to be canceled or when the forwarding station's extension number is not known, the user dials #*34*.

Considerations

■ Calls forwarded to outside telephone numbers via Remote Call Forward may vary in transmission quality.

■ When Remote Call Forward is used, calls are not forwarded to outside telephone numbers on loop-start lines/trunks when the system is programmed for unreliable disconnect for loop-start lines/trunks. The call rings on the forwarding telephone and is not forwarded.

■ The capability of using Remote Call Forward to forward calls received on a personal line (excluding loop-start lines/trunks with unreliable disconnect) to an outside number must also be assigned in system programming and can be assigned to only one extension for each line/trunk.

■ The reliable disconnect setting cannot be programmed for T1 channels that are programmed to emulate a loop-start line/trunk. When a call is received on a T1 channel programmed to emulate a loop-start line/trunk, and Remote Call Forward is used, the call is forwarded to the primary system operator instead of to the destination telephone number.

■ When Remote Call Forward is used and the line is shared by other users, only the assigned principal user can forward calls to an outside number. If a principal user is not assigned, calls cannot be forwarded to an outside number.

■ When the principal user forwards calls to an outside telephone number via Remote Call Forward, all calls received on an Intercom or System Access button are forwarded to the outside number.

■ When the principal user forwards calls to an outside number via Remote Call Forward, other users who share the personal line cannot join an in-progress call while the outside telephone number is being dialed.

■ A user who shares a personal line cannot join an in-progress call forwarded to an outside telephone number unless the user shares both the personal line on which the call was received and the personal line used to forward the call to the outside number.

■ When two or more users sharing a personal line forward calls to an extension via Forward or Follow Me, calls received on the personal line are forwarded to all destinations.

■ A user can forward calls to only one extension or outside telephone number but can receive forwarded calls from an unlimited number of telephones.

■ The call cannot be forward to the destination telephone while the destination telephone is ringing with another call. When a QCC is the destination, this includes calls ringing in the queue until the QCC becomes available. On multiline telephones, the call rings at the destination telephone with an abbreviated ring, but is not forwarded. On single-line telephones, the call rings only at the forwarding telephone.

■ Forward, Remote Call Forward, and Follow Me forward a call only once. For example, if a user A forwards calls to user B, who is forwarding calls to user C, user A's calls are only forwarded to user B and not to user C.

■ Forward (including Remote Call Forward) and Follow Me cannot be used at the same time. When the second feature is activated, the first one is canceled automatically.

■ Voice announcements cannot be forwarded.

■ A call forwarded to an extension rings both at the forwarding telephone and at an available System Access or Intercom button on the destination telephone.

■ A call forwarded to an outside number does not ring at the forwarding telephone.

■ No error tone sounds when the user with a restricted telephone forwards calls to an outside number by using Remote Call Forward. However, when a call eligible for forwarding is received, the system checks restrictions and denies the forward if the outside telephone number is not on an Allowed List assigned to the telephone or is included on a Disallowed List assigned to the telephone.

■ If a user enters an invalid destination while programming Forward or Remote Call Forward, the system does not provide an error indication.

■ Outside calls received at the forwarding station ring as an internal call (one ring burst) at the destination station without the normal distinctive ring for an outside call.

■ If a user enters an invalid destination while programming Forward, Remote Call Forward, or Follow Me, the user hears a fast busy signal. On a display MLX telephone, the display clears. If an analog multiline display telephone user enters an invalid destination while programming Follow Me, the display shows Error. No error message appears on the display when an invalid destination is entered for Forward or Remote Call Forward.

■ Calls received on a Cover button are not forwarded.

■ On multiline telephones, Forward should be programmed on a button with LEDs so a user can see feature status.

Feature Interactions

Account Code Entry

Account codes cannot be entered for calls forwarded to outside telephone numbers. Account codes are not necessary for calls forwarded to extensions.

Allowed List Calling Restrictions

A user with an outward restricted telephone cannot forward calls to an outside number unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number unless the number is on an Allowed List assigned to the telephone. When activating Forward, the user with a restricted telephone does not hear an error tone, but when a call is received, the forward is denied if the number is not on the Allowed List.

Auto Answer All

An answering device connected to an analog multiline telephone can answer forwarded calls when Auto Answer All is activated.

Automatic Route Selection

ARS can be used to select the facility on which to forward calls to an outside telephone number. The user enters the ARS code before the telephone number. The FRL for the call is that of the telephone from which calls are being forwarded.

Barge-In

When a forwarded call is answered at the destination station, Barge-In can be used to join the call only by dialing the extension number for the destination station (not the extension for the originating station). Barge-In cannot be used to join a call forwarded to an outside telephone number.

Callback

If a user queues a call and then uses Forward, Remote Call Forward, or Follow Me, the call does not ring back at the extension or telephone number where the calls have been forwarded; the Callback call returns only to the forwarding telephone.

When a user with Automatic Callback activated selects a pool on which to forward calls to an outside number and all trunks in the pool are busy, the caller hears queuing tone when the call is queued for the busy pool. When the pool is available, the caller hears the dequeuing tone and the call is completed to the outside telephone number.

When a user with selective Callback selects a pool on which to forward calls to an outside number and all trunks in the pool are busy, the caller hears a busy signal to indicate all trunks in the pool are busy. If the call is from an inside caller, the caller can activate Callback and the call is queued for the forwarding telephone and not the busy pool. Outside callers cannot use Callback when the forwarding telephone is busy.

Call Waiting

Call Waiting does not apply for forwarded calls since the system tries the destination telephone instead of the forwarding telephone. One exception is when the call is not forwarded for any reason (the line/trunk selected is an unreliable loop-start line/trunk) call waiting functions normally.

Conference

When calls received on a personal line are forwarded to an outside telephone number and another user who shares the personal line and the line/trunk selected to forward the call joins the in-progress call (by pressing the Personal Line button) the person joining the call is considered the conference originator and the forwarded call can be conferenced. If the person joining the call hangs up, all participants on the conference call are disconnected.

Coverage

When a sender forwards calls, the calls go to Coverage at the same time. Calls received on a Primary Cover, Secondary Cover, or Group Cover button cannot be forwarded.

Direct-Line Console

The DLC system operator can forward calls to extensions and if the capability is assigned in system programming, to outside telephone numbers. Since outside lines are assigned as Personal Line buttons on the console, the capability to forward calls received on each outside line (excluding loop-start lines/trunk with unreliable disconnect) to an outside number must also be assigned in system programming and can be assigned to only one telephone for each individual line/trunk.

Direct Station Selector

Forward can be activated by pressing a programmed button or using a feature code then pressing a DSS button corresponding to the destination user's extension number. Follow Me can be activated by using the feature code then pressing a DSS button corresponding to the destination user's extension number.

Disallowed Lists

A user cannot forward calls to an outside number (Remote Call Forward) if the number is on a Disallowed List assigned to the telephone. An error tone is not supplied when the user with a restricted telephone activates the Forward feature, however, when a call is received at the station, the system checks restrictions and denies the forward if the number is in the Disallowed List.

Display

When an MLX telephone user forwards calls to an extension, the display prompts for the extension. After Forward is activated, the user sees a confirmation message. A user receiving a forwarded call sees a message indicating who forwarded the call. For outside calls, page 2 shows the line the call came in on and if ANI is available, the caller's number. For inside calls, page 2 shows the caller's name and extension.

On MLX telephones, when a user forwards calls to an outside number (Remote Call Forward), the display prompts the user to enter the telephone number. On MLX and analog multiline telephones, the digits appear on the display as the user dials the outside number. MLX telephone users receive a feedback message showing that their calls are now forwarded to an outside number.

An MLX telephone user sees a prompt on the display when Follow Me is activated or canceled. After the feature is activated, the "Signed In" confirmation message is shown and after the feature is canceled, the "Signed Out" confirmation message is shown.

If an MLX display telephone user enters an invalid destination while programming Forward, Remote Call Forward, or Follow Me, the display clears. If an analog multiline display telephone user enters an invalid destination while using Follow Me, the display shows "Error"; no error message is provided on the display when an invalid destination is entered when programming Forward or Remote Call Forward.

Do Not Disturb

Calls are not forwarded to a user who has Do Not Disturb active; the call rings only at the forwarding telephone. Activating Do Not Disturb at the forwarding telephone does not prevent the calls from being forwarded.

Forced Account Code Entry	Telephones with Forced Account Code Entry assigned can forward calls only to extensions and not to outside telephone numbers. The user hears a fast busy signal if trying to forward calls to an outside telephone number.
Multi-Function Module	The use of Forward (including Remote Call Forward) and Follow Me is not recommended on an MFM beoause the user does not have an LED that indicates when the feature is active.
Group Calling	An available calling group member is automatically logged out when calls are forwarded to an extension or telephone number. If a calling group member logs in while calls are being forwarded, Forward or Remote Call Forward is automatically canceled. Calls cannot be forwarded to calling groups. When a line/trunk programmed to ring into a calling group is assigned as a personal line on a principal user's telephone, an incoming call received on the personal line is not sent to the calling group if the principal user forwards calls to an outside telephone number via Remote Call Forwarding.
Night Service	When a station is a member of a Night Service group and Night Service is activated, calls received at the station are forwarded to extensions by using Forward and Follow Me but are not forwarded to outside telephone numbers when Remote Call Forward is used.
Paging	Calls cannot be forwarded to a paging group. The line/trunk number used to connect loudspeaker paging equipment cannot be used to forward calls to outside telephone numbers.
Park	Returning parked calls are not forwarded.
Personal Lines	When an extension is programmed as the principal user of a personal line, calls received on the personal line are forwarded to an outside number (if the station can use the Remote Call Forward feature), unless the outside line/trunk is a loop-start line/trunk with an unreliable disconnect.
Pickup	Pickup features cannot be used to answer calls being forwarded to an outside telephone number.
Pools	A pool can be used to forward calls to an outside telephone number. The user enters the pool dial-out code before the telephone number.
Privacy	When calls are forwarded to an outside number while the system is dialing the outside number, the Privacy feature is automatically activated and users who share the personal line cannot join the call.

Queued Call Console

A QCC system operator cannot forward calls to extensions or telephone numbers. The system operator uses Position Busy instead to send calls to a backup calling group.

Calls that are forwarded to an individual QCC system operator or Follow Me calls that are signed into a QCC can be assigned a queue priority. When the system operator uses Position Busy, forwarded calls and Follow Me calls signed into the QCC position continue to ring at the QCC.

Remote Access

Users can setup forwarding of calls to extensions or outside telephone numbers via Remote Access. To do so, the user calls into the system on a line/trunk that is programmed for Remote Access. If a barrier code is required, the user hears the Remote Access dial tone (stutter tone) and enters the barrier code. Once the barrier code is correctly entered (or if barrier codes are not required), the user hears system dial tone.

If the user wants to forward calls to an extension, the user dials #33 followed by the extension number. If the user wants to forward calls to an outside telephone number, the user dials #33, selects the line/trunk or pool on which to forward the call by dialing the Automatic Route Selection (ARS) or pool dial-out code (Hybrid/PBX only), the Idle Line access code (9 - for Key and Behind Switch only), or the line/trunk number (801-880). After selecting the outside line/trunk or pool to use, the user dials the destination telephone number followed by a # to signal the end of the dialing sequence.

Ringing Options

On multiline telephones, calls forwarded to an extension ring with an abbreviated ring at the forwarding telephone and also ring at the destination telephone. On single-line telephones, calls forwarded to an extension ring at both the forwarding telephone and the destination telephone. On both multiline and single-line telephones, calls forwarded to a telephone number do not ring at the forwarding telephone.

Outside calls received at the forwarding station ring as an internal call (one burst of ring) at the destination station instead of the normal distinctive ring for an outside call.

Station Message Detail Recording

If the system is programmed to track both incoming and outgoing calls, two SMDR records are generated when an outside calll is forwarded to an outside telephone number. One record shows the incoming call and the other record shows the call made to the destination telephone number with the forwarding telephone as the originator.

System Access

In the Hybrid/PBX mode, calls are forwarded from the telephone that activated Forward or Remote Call Forward. A Shared System Access button cannot be used to activate Forward or Remote Call Forward for the principal's telephone. Calls received on a Shared System Access button are not forwarded.

When calls are forwarded to an extension number, a call received on an Intercom or System Access button rings once at the forwarding station's Intercom or System Access button (including all assigned Shared System Access buttons even though a call received on these buttons is not forwarded) and also rings at the destination station's Intercom or System Access button (including all assigned Shared System Access buttons).

Transfer Inside and outside calls transferred by another user or by a system operator are forwarded. If a user transfers a call to an extension with calls forwarded, the extension receiving the forwarded calls hears one burst of ring indicating an inside call. If the extension is a display telephone, the call information appears as an internal call and not an outside call.

Voice/Announce to Busy Voice-announced calls are not forwarded.

System Programming

■ Allow or remove individual extension capability of forwarding calls to an outside telephone number (Remote Call Forward).

> **Extensions -> More -> Remote Frwd**

■ Assign or remove principal user of a personal line-specifies that an individual extension can forward calls received on a specific personal line to an outside telephone number; calls received on the personal line follow only the individual extension's Coverage patterns and not the Coverage patterns of other users who share the line.

> **LinesTrunks -> More -> PrncipalUsr**

Group Calling

Extension Programming	**Programming Code:**	
	Any Station:	
	In-Queue Alarm:	***22 + calling group extension no.**
	Calling Group Supervisor:	
	Unavailable (ES Station 0):	***760**
	Available (ES Status 2):	***762**
	Calling Group Members:	
	Log In/Out	***44**
	Feature Code:	
	Calling Group Supervisor:	
	Enter supervisory operation:	**32 + Hold button**
	Exit supervisory operation:	**32 + Drop button**
	Unavailable (ES Status 0):	**760 +DSS**
	Available (ES Status 2):	**762 +DSS**
	Calling Group Members:	
	Log In:	**44**
	Log Out	***44**
	MLX Display Label:	
	Unavailable (ES Status 0):	**ES Status, ES off [ES, ESoff]**
	Available (ES status 2):	**ES Status, ES2 [ES, ES2]**

Description

Group Calling is used to direct incoming calls to a specific group of telephones ("a calling group"). A system can have a maximum of 32 calling groups with a maximum of 20 telephones per group, but a telephone can be a member of only one group.

A calling group is a team of individuals who answer and handle the same kinds of calls—for example, high volume work groups such as sales, service, marketing, repair, and technical support. Also, fax machines that receive a large number of fax messages can be placed in a calling group to allow multiple calls to be sent.

Through Group Calling, all members in the calling group are assigned to a single extension number. Specific lines/trunks can be assigned to ring directly into the calling group so that outside callers can dial a published telephone number to reach the group, bypassing the system operator.

Calls that come into a calling group are usually not intended for a particular group member, and they can be handled by any member. However, inside callers can reach a specific calling group member by dialing the individual extension number assigned to the member.

As calls come into the calling group, the system hunts for an available group member in a circular or linear manner (see "Hunt Type" in this section). If a group member is available, the call rings on a System Access or Intercom button. If all group members are busy or otherwise unavailable, calls are held in a queue. As calling group members become available, the calls are distributed on a first in/first out basis.

Inside callers who are transferred to the calling group hear a regular ringback when all calling group members are busy and the call is sent to the calling group queue; outside callers hear ringback or Music-On-Hold if it is programmed for the system. In addtion, an announcement device can be assigned to the group to play a recorded announcement to each waiting caller in the order that the calls arrive in the queue.

Calling group members log in when they are ready to take calls ("available status") and log out while they finish call-related activities or when they leave their positions ("unavailable status").

Calls are sent to a calling group member only if the member is logged in and is not busy on another call. When the Group Type is set to Auto Logout (the factory setting), if a call is sent to a calling group member and is not answered within 30 seconds (5 rings), the call is sent to another member or to the front of the queue if another calling group member is not available. The system automatically logs out the station where the call went unanswered and makes it unavailable for subsequent calls until the calling group member logs in.

A calling group member is considered available if all of the following conditions are met:

■ The station is signed into the calling group (available status).

■ The station is on-hook (handset is down or headset user disconnected the last call and no red LED is on at the telephone) and the speakerphone is off.

■ The station is not ringing or busy on another call.

■ The station does not have a call on hold.

■ The station is not transferring a call.

■ The station is not in the program or test mode.

■ A System Access or Intercom button is available for call delivery.

■ Do Not Disturb is not activated.

■ Calls are not being forwarded via Forward, Remote Call Forward, or Follow Me.

■ The calling group member did not activate Callback to reach a busy trunk (Hybrid/PBX only) or extension.

■ The system is not calling another user who activated the Callback feature to reach the calling group member.

Calling Group Options

The Group Calling options assigned through system programming and available only for calling groups are described below.

Calling Group Supervisor Position

The Calling Group Supervisor Position is a direct-line console (DLC) with Extension Status assigned through system programming. The calling group supervisor monitors and controls calling group activity by using the LEDs and programmed buttons on the console or Direct Station Selector (DSS).

The supervisor console should include the following programmed buttons:

■ One button per calling group member, programmed with the member's extension on the telephone or an optional DSS.

■ A Calls-in-Queue Alarm button (either on the console or on a DSS), programmed with the calling group's extension, for monitoring calls in queue. If the supervisor manages more than one group, he or she needs a button for each group.

■ Status buttons for controlling calling group member availability an Available button (also called ES Status 0) and an Unavailable button (also called ES Status 2).

Hunt Type

The placement of each telephone in the hunting sequence used by the system to search for an available calling group member is determined by the order in which each telephone is assigned to the group during system programming. When the first call arrives for a calling group after a system is installed or restarted ("cold start"), the system searches for an available group member starting with the first telephone assigned to the group during system programming.

The order im which the system searches for an available calling group member for subsequent calls can be either circular or linear and is called the "hunt type."

■ **Circular.** As subsequent calls arrive, the system searches for an available calling group member starting with the station after the last station to receive a call. This ensures that calls are evenly distributed among group members. The circular order is the factory setting and is used when all group members have the same responsibilities for handling calls.

■ **Linear.** As subsequent calls arrive, the system distributes calls starting with the first telephone assigned to the group through system programming. This means that most calls are handled by the first member assigned to the group. This method is used, for example, when the primary responsibility of the first calling group member is to take calls and other group members provide backup.

Delay Announcement	Each calling group can have a delay announcement device (such as an answering machine) that plays a message to a caller explaining the delay. The device can be connected to the control unit on a 012 (T/R) or 008 OPT module, or can be connected to an MLX telephone by using a Multi-Function Module (MFM), or an analog multiline telephone with a GPA. Each device is identified by the extension number assigned in the system numbering plan. Each calling group can have a separate delay announcement or any number of groups can share one. The delay announcement device should not be assigned as a calling group member.

When no calling group members are available and a call enters the calling group queue, the announcement device answers the call that has been waiting longest and plays the recorded message. After the delay announcement, an inside caller hears a special ringback a transferred inside caller hears regular ringback, and an outside caller (including transferred outside callers) hears ringback or Music-on-Hold, if programmed, until the call is answered by a calling group member. The delay announcement is played only once while the call is in queue.

If a calling group member becomes available while the caller is listening to the delay announcement, the system immediately routes the caller to the calling group member. The announcement device is then free to handle another queued call.

Each announcement device has an extension number. This allows a calling group member or calling group supervisor to dial this number to check the announcement or to change the announcement (if the delay announcement device allows the user to read or change messages remotely).

If the device is malfunctioning and does not answer the call within 30 seconds (5 rings), the system automatically logs out the device and makes it unavailable for subsequent calls until the calling group supervisor logs in the device or until the next system cold start. The only effect on incoming calls is that callers do not hear the announcement.

Message-Waiting Receiver	The message-waiting receiver is the telephone designated to receive message-waiting indications for the calling group. This includes message-waiting indications sent from the system operator, from a display telephone using Leave Word Calling, or from a fax machine. Any type of telephone with a message LED can be assigned as a message-waiting receiver.

The telephone designated as the message-waiting receiver does not have to be a member of the calling group. Each calling group can have only one telephone assigned as its message-waiting receiver, but the same telephone can be assigned as the message waiting receiver for more than one calling group.

Note: Message-waiting indications cannot be sent to the extension assigned to the group unless this option is programmed. The message-waiting receiver cannot distinguish between messages left for the calling group and personal messages.

Calls-in-Queue Alarm Threshold

The Calls-in-Queue Alarm Threshold is the number of calls (1-99) allowed in the queue before calling group members are notified. When the number of waiting calls is equal to or greater than the programmed Calls-in-Queue Alarm Threshold, the calling group members can be notified in one of two ways:

■ Via an assigned external alert connected to an analog multiline telephone by using a Supplemental Alert Adapter (SAA), or connected to an MLX telephone by using an MFM. Since the tone sent to the alert is continuous, it is recommended that only a device such as a strobe light be used, which stays lit until the number of calls drops below the limit. Only one external alert can be assigned to each calling group and each external alert can be assigned to only one calling group.

■ Via the LED associated with a button programmed with the calling group's extension or a DSS button that corresponds to the extension. The LED associated with either type of button does not go out until the number of calls drops below the limit. There is no limit to the number of buttons that can be programmed to provide the Calls-In-Queue Alarm indication.

Overflow Coverage

When the number of calls waiting in the calling group queue reaches a programmed threshold of 1-99 (the factory setting is 1), calls can be sent to an Overflow Coverage group, which can be another calling group or a queued call console (QCC) queue. Only one calling group or QCC queue can be programmed to provide Overflow Coverage for the same calling group, and each calling group or QCC queue can provide Overflow Coverage for more than one calling group.

Before calls are directed to an overflow calling group, the following conditions must be met:

■ The number of calls in the queue is equal to or greater than the programmed threshold.

■ The overflow calling group has an available calling group member.

■ There are no calls queued for the overflow calling group.

If any of the conditions are not met, the call continues to wait on the sending calling group queue until a calling group member is available or until the overflow renditions are met and the call can be directed to the overflow calling group.

If all conditions are met, calls are directed to the overflow calling group on a first-in/first-out basis until the number of queued calls in the covered calling group is less than the programmed threshold. The system searches for an available calling group member according to the hunt type assigned to the overflow calling group. Since the calls wait in the original calling group queue, they are not eligible for the overflow group's Overflow Coverage.

When the overflow calling group's group type is set to Auto Logout and an overflow call is not answered within 30 seconds (5 rings), the overflow calling group member is logged out. The call is returned to the original calling group's queue and is placed at the front of the queue. The caller does not hear the delay announcement even if the call was sent to the overflow calling group before the caller heard the delay announcement.

When the QCC queue is assigned to provide overflow coverage for a calling group, the following conditions must be met before calls are directed to the QCC queue:

■ The number of calls in the calling group queue is equal to or greater than the programmed threshold.

■ All QCC system operators are not in Position Busy mode.

An overflow call that is sent to the QCC queue does not return to the calling group even if the call is not answered.

Calling Group Type

The Group Type setting determines whether or not the system automatically logs in members of a calling group following a power failure.

The following settings are available:

■ Auto Logout — (the factory setting) This setting is used for calling groups to specify that the system does not automatically login calling group members after a power failure.

■ Auto Login — This setting is for calling groups used for fax machines or data (also called "data hunt groups") to specify that the system automatically logs in calling group members following a power failure. See the Data Guide for more detailed information. The setting can also be used for calling groups involving telephones.

■ Integrated VMI — This setting is used when a voice processing system (such as AUDIX Voice Power - IS II or MERLIN MAIL™) that requires special signaling for integrated operation is connected to one or more station jacks assigned to a calling group. The system automatically logs in the calling group members after a power failure.

■ Generic VMI — This setting is used when a voice processing system (such as MERLIN Attendant or Integrated Voice Power Automated Attendant) that does not require special signaling, is connected to one or more station jacks assigned to a calling group. The system automatically logs in the calling group members after a power failure.

Telephone Differences

Multiline Telephones

Only a telephone assigned as a DLC can be a Calling Group Supervisor Position. The supervisor must activate Extension Status to see the status of calling group members and to change their availability; this cannot be done from normal call handling operation.

To activate Extension Status, the calling group supervisor presses the Feature button, dials 32, and presses the Hold button. To deactivate the feature and return to normal call handling, the supervisor presses the Feature button, dials 32, and presses the Drop button.

To change the availability of a calling group member, the supervisor activates Extension Status (if not already active), and presses a programmed button for Available (extension status 2) or Unavailable (extension status 0) and the Auto Dial or DSS button for the group member's extension number. The supervisor can also change the status of telephones by pressing the Feature button, dialing the feature code (762 for Available and 760 for Unavailable), and pressing the Auto Dial or DSS button for the group member's extension number. A supervisor with an MLX display telephone can change the status of telephones by pressing the Feature button, selecting the feature from the display (ES2 On for Available and ES Off for Unavailable), and pressing the Auto Dial or DSS button for the group member's extension number.

Calling group members log into the group by pressing the programmed Available button or by pressing the Feature button and dialing 44. To log out, the group member can press the programmed Available button or can press the Feature button and dial *44.

To see the number of calls waiting in queue (1-99), the. supervisor or group member with an MLX display telephone presses the Inspect button followed by the programmed Calls-In-Queue Alarm button. The Inspect feature cannot be used for a Calls-In-Queue Alarm button on a DSS. An analog multiline user cannot use the Inspect feature.

Single-Line Telephones   A calling group member with a single-line telephone can log into and out of the calling group by lifting the handset (which must be connected to an Intercom or System Access line) and dialing #44 to log in or #*44 to log out.

Mode Differences

Calls to calling groups in a system set up in Behind Switch mode do not follow the central office ring pattern.

Considerations

■ A system can have a maximum of 32 calling groups with a maximum of 20 members per group.

■ Calling groups with no members are allowed. If a call is received at the calling group, it is immediately sent to the calling group queue. If no overflow coverage is programmed or the call is not answered at a personal line, the call continues to ring in the queue until the caller hangs up.

■ Each group can have a separate delay announcement device (a maximum of 32 devices per system), and each device can be assigned to more than one calling group.

■ The delay announcement device should not be programmed as a calling group member.

■ Only one external alert can be assigned to each calling group. An external alert cannot be assigned to more than one calling group.

■ The system does not block the programming of any station jack (including station jacks used for telephones or system operator consoles) as an external alert that provides Calls-in-Queue Alarm indication. However, programming a telephone as a Calls-in-Queue Alarm is not recommended since the telephone rings continuously while the number of calls in the calling group queue is equal to or greater than the programmed threshold.

■ A calling group or QCC queue can be a receiver for one or more Overflow Coverage groups. Only one calling group or QCC queue can be assigned as a receiver for each Overflow Coverage group.

■ Extension Status must be set to Calling Group/CMS (the factory setting) and not hotel configuration.

■ The Integrated or Generic VMI group type cannot be assigned to a calling group used for fax machines.

■ Individual calling group member stations are assigned an extension number, which allows a group member to receive calls as an individual as well as a group member.

■ When calling group members make a call to their own calling group, the call is not delivered to that group member since he or she is considered unavailable while making the call.

■ To allow all calling group members' stations to ring when an outside call is not answered within three rings, the lines/trunks programmed to ring into the queue can also be assigned to buttons on calling group members' telephones and programmed for delayed ring. This does not work for inside calls, Remote Access calls, and direct inward dialing calls, or if a delay announcement device is assigned to the group.

■ Lines/trunks that are programmed to ring into a calling group also ring at any telephones that have the line/trunk assigned to a button. If a call is answered at anyone of these telephones, the call is removed from the calling group queue.

■ A line/trunk cannot be programmed to ring into more than one calling group.

■ A line/trunk cannot be programmed to ring into both a calling group and a QCC queue.

■ If no line/trunks are assigned to the calling group, only inside calls are eligible for calling group distribution.

■ Calls are not sent to an overflow group's queue and therefore are not eligible for that group's Overflow Coverage.

■ The delay announcement is not played when a call is returned to the queue after being sent to a calling group member who does not answer.

■ Any multiline telephone in the system can be used to monitor the status of a calling group's queue by programming the Calls-in-Queue Alarm button. An MLX display telephone can be used to view the number of calls in a queue (1-99) on the display by pressing the Inspect button and then pressing the Auto Dial button programmed with the calling group's extension number.

■ The calling group supervisor can log in or log out delay announcement devices.

■ Any of the multiline and single-line telephones that are compatible with the system can be used as calling group member positions.

■ Any of the following telephones assigned as a DLC can be used as a calling group supervisor's console:

  ■ MLX-20L™ telephones with or without a DSS

  ■ MLX-28D™ telephones with or without a DSS

  ■ BIS-22 with a display

  ■ 61S-34 with or without a display

  ■ MERLIN II System Display Console with built-in DSS

■ Labels can be assigned to calling groups to identify the name of the group, such as sales, service, or claims, on display telephones.

■ The system does not prevent users who are not members of a calling group from using the Available and Unavailable programmed buttons or feature codes. Call Management System (CMS) agents who may not be calling group members can use these same codes to log in and out of the CMS.

■ The published number for a calling group can be a DID number.

Feature Interactions

Auto Answer All

Calling group members with analog multiline telephones can use Auto Answer All when an answering machine is connected to their telephones. When the feature is activated, all incoming calls ringing on the group member's telephone (both calls for the calling group and calls to the group member's own extension), are answered automatically by the answering machine.

Auto Dial

The Call-In-Queue Alarm button is assigned on a multiline telephone by programming an inside Auto Dial button with the calling group's extension number.

When a DSS adjunct is not available, Auto Dial buttons programmed with each calling group member's extension are used by the calling group supervisor to monitor group member availability.

Barge-In

Barge-In can be used for calling group members, but the member's extension must be used instead of the calling group extension. If a user tries to use Barge-In after dialing the calling group extension number and waiting in the queue, the feature has no effect.

If a person uses Barge-In to reach another user who is waiting in a calling group queue, the call is removed from the queue and both people and the delay announcement, if programmed, are connected. If a person uses Barge-In for the delay announcement extension and the device is playing a message to a caller, the call is removed from the queue and both people and the delay announcement are connected.

Callback
Calls made to a calling group are not eligible for Callback since the call rings into the calling group's queue. However, Callback can be used for calls to individual calling group member extensions or to the delay announcement device. Calling group calls are not sent to the group member telephone when the calling group member uses Callback for a busy extension or pool or if another person used Callback to reach to calling group member and the Callback call is ringing on that person's telephone.

Call Waiting
Calls made to a calling group are not eligible for Call Waiting since the call rings into the calling group's queue. However, call waiting can be used for calls to individual members of the calling group. If the calling group member is a fax, the Call Waiting tone is not given to the fax port.

Camp-On
Users can transfer calls to a calling group by using Camp-On, but calls do not return to the originating telephone, even if it is not answered within the programmed Camp-On Interval. If the calling group is made of fax machines, the Call Waiting tone is not given to the fax port.

Conference
Calls waiting in the calling group queue or ringing at a calling group member's station cannot be added to a conference call. A user must be connected to a calling group member before the call can be added to the conference.

Coverage
A calling group cannot be programmed as a receiver for Individual Coverage. A coverage group can have a maximum of one calling group as a receiver. If a calling group is programmed as a receiver for a coverage group, it can be the only Group Coverage receiver individual Coverage (primary and/or secondary) receivers can be programmed. A calling group can be a receiver for 1-30 coverage groups.

As soon as the call is sent from the calling group queue to a calling group member, the call appearance is removed from the sender's telephone (except for outside calls received on personal fines).

A calling group member can be a sender for Individual Coverage (Primary or Secondary) or Group Coverage. Calls to the calling group extension number are sent only to the calling group member's Individual Coverage receivers and not to the Group Coverage receivers. Calls to the calling group member's individual extension are sent to both Individual and Group Coverage receivers.

Direct-Line Console
A DLC can be a member of a calling group and is normally used as the calling group supervisor position.

Direct Station Selector
The LED for a DSS button for calling group extension number indicates the status of calls in the calling group queue. The LED is on when calls are at or above the programmed threshold and off when below the threshold.

Display

Calling group agents with MLX display telephones see feedback messages on the display when they log into the Available state. When a calling group supervisor with an MLX display telephone logs calling group members in or out, a message appears on the supervisor display and on the group member's display. After pressing either the Available or unavailable button or dialing the feature code, supervisors with MLX telephones are prompted to indicate which group member they want to log in or out. When a calling group member with an MLX telephone receives an outside call for the calling group, the type of call is identified on the display along with the label for the line the call came in on. If automatic number identification (ANI) is available, the number of the caller is shown on page 2 on MLX telephones. Analog multiline telephone users see only the line information. Any MLX telephone user can inspect the number of calls in queue by pressing Inspect and then pressing a button programmed with the calling group's extension. The display shows the label associated with the calling group and the number of calls.

Do Not Disturb

If a calling group member uses Do Not Disturb, calls are not sent to the group member even if he or she is logged in and available.

Extension Status

Extension Status allows calling group supervisors to change and monitor calling group member status, and enable group members to sign in and out of the calling group.

Forward and Follow Me

An available calling group member is automatically logged out when calls are forwarded to an extension or telephone number. If a calling group member logs in while calls are being forwarded, Forward or Remote Call Forward are automatically canceled. Calls cannot be forwarded to calling groups.

When a line/trunk is assigned as a personal line on a station assigned as a principal user and the line/trunk is also programmed to ring into a calling group, an incoming call received on the personal line is not sent to the calling group if the principal user forwards calls to an outside telephone number using Remote Call Forwarding.

Hold

A calling group member who put a call on hold by using the Hold button is considered unavailable for incoming calls. A user waiting in the calling group queue cannot put the call on hold.

Labeling

An alphanumeric label can be assigned to the calling group. The label is displayed only when an MLX display telephone user presses the inspect button and an Auto Dial button programmed with the calling group's extension number.

Messaging

Users can leave messages for the calling group only if the system has been programmed with a designated Calling Group Message Receiver. The receiver also receives fax message-waiting indications directed to the calling group. The message-waiting receiver cannot distinguish between messages left for the calling group and fax or personal messages.

Multi-Function Module	An MFM can be a member of a calling group, can be assigned as a delay announcement for a calling group, or can be used to connect the calls-in-queue alert for the calling group. An MFM that is used for the delay announcement or calls-in-queue alert should not be assigned as a group member.
Music-on-Hold	An outside caller waiting in the calling group queue hears Music-on-Hold if it has been programmed.
Park	A calling group member who parks a call is considered available to receive another call.
Personal Lines	To allow all calling group members' telephones to ring when an outside call is not answered within three rings, the lines/trunk programmed to ring into the queue can also be assigned to buttons on group member telephones and programmed for delayed ring. This does not work for inside calls, Remote Access Calls, and direct inward dialing calls, or if a delay announcement device is assigned to the group.
	If a person uses a shared Personal Line button to join a call waiting in the calling group queue, the call is removed from the queue. If a delay announcement is playing, it is disconnected from the call.
Pickup	A calling group member can be a member of a Pickup group. Calling group members can use Pickup to answer a call (either to the calling group or to the individual group member's extension) ringing at another group member's telephone. Line Pickup can be used to pickup a call in the calling group queue.
Pools	Trunks assigned to pools can be assigned to ring into a calling group. An incoming call on a trunk assigned to the pool rings on a System Access button even if the calling group member has a Pool button assigned.
Queued Call Console	Only a calling group can be programmed to provide Position Busy backup when all QCC system operators activate Position Busy. If no calling group is designated to provide backup, the system does not allow all QCC operators to activate Position Busy.
	A QCC cannot be a member of a calling group and cannot be assigned as a calling group or CMS supervisor position.
	The QCC queue can be designated to provide overflow coverage for calls from one or more calling groups. When an overflow call is sent to the QCC queue, it cannot be distinguished as a call to a calling group.
	When the QCC queue is providing overflow coverage for a calling group and all QCC system operators are in Position Busy, overflow calls do not receive Position Busy backup (they are not redirected to a second calling group providing Position Busy backup for the QCC queue) and continue to wait in the original calling group queue.

If all QCC system operators activate Position Busy while an overflow call is in the QCC queue, the call is re-routed to the original calling group and not to the calling group providing Position Busy backup.

Remote Access

Remote Access users cannot log into a calling group but a Remote Access user can call into a calling group regardless of the restrictions applied. When the call rings at a calling group member's telephone, it rings as an outside call. A calling group can be programmed to receive calls from Remote Access users to invalid extensions. A line/trunk cannot be programmed for both Remote Access and ringing into a calling group.

Ringing Options

Abbreviated ring is not operable for calls to the calling group extension since a calling group member active on a call is considered unavailable for incoming calls. In the Hybrid/PBX mode, calling group members should program System Access buttons for Immediate Ring.

Signaling

A signaling button cannot be programmed for a calling group.

Station Message Detail Recording

Calls to calling groups are associated with the first extension to handle the call. If the call is answered by the calling group delay announcement device, the extension for the device is recorded on the SMDR record even if the call is transferred to a calling group member or to an overflow group. The timing begins as soon as the calling group member or delay announcement device answers the call. If the caller hangs up while when listening to a delay announcement the call is associated with the extension of the answering device.

System Access

Incoming calls to the calling group ring at Intercom or System Access buttons on calling group member telephones. In the Hybrid/PBX mode, a calling group member using a Shared System Access button to make or receive a call is considered unavailable. However, the principal station member is not considered unavailable and can still receive calls directed to the calling group since use of a Shared System Access button does not indicate that the principal calling group member is on a call.

If a person uses a Shared System Access button to join a call waiting in a calling group queue, the call is removed from the queue and both people and the delay announcement, if programmed, are connected.

System Numbering

Extensions for calling groups (the factory-set extensions are 770-791 and 7920-7929) are assigned and can be renumbered through System Numbering.

Transfer
A call transferred to a calling group is not returned to the originator; the call is handled like any other call received in the calling group. For example, the system follows the same hunt sequence to locate an available calling group member and the call is eligible for a delay announcement if one is programmed. A calling group member, is considered available for a call while in the process of transferring a call. Voice-announced transfers cannot be made to a calling group. There is no limit to the number of calls that can be transferred to a calling group.

When an inside caller is transferred to a calling group and no members are available, the inside caller hears regular ringback. When an outside caller is transferred to a calling group and no members are available, the outside caller hears regular ringback or Music-on-Hold if it is programmed.

System Programming

■ Assign calling group members and calling group supervisors to each calling group.

```
Extensions -> More -> Grp Calling -> Members
```

■ Assign lines/trunks to ring into the calling group.

```
Extensions -> More -> Grp Calling -> Line/Pool
```

■ Select the hunt type-circular (the factory setting) or linear

```
Extensions -> More -> Grp Calling -> Hunt Type
```

■ Designate a delay announcement device.

```
Extensions -> More -> Grp Calling -> DelayAnnce
```

■ Assign the calling group as a receiver for a Group Coverage sender group

```
Extension -> More -> Grp Calling -> GrpCoverage
```

■ Assign a Message Waiting Receiver for the calling group.

```
Extension -> More -> Grp Calling -> Message
```

■ Change the Calls-In-Queue Alarm Threshold.

```
Extension -> More -> Grp Calling -> Queue Alarm
```

■ Assign an external alert to notify calling group members of a Calls-in-Queue Alarm.

```
Extensions -> More -> Grp Calling -> Xtnl Alert
```

■ Set the overflow threshold and designate a calling group or QCC queue to provide overflow coverage.

```
Extensions -> More -> Grp Calling -> Overflow
```

■ Change the calling group typesetting to determine whether or not calling group members are automatically logged in after a system cold start (no auto login is the factory setting). When the calling group is used for voice messaging systems, specify whether the type of voice messaging interface (VMI) is integrated or generic.

```
Extensions -> More -> Grp Calling -> Group Type
```

Related Features

■ Extension Status

Headset Options

Extension Programming

> **Handset Auto Answer**
> **Programing Code:** *780
> **MLX Display Label:** Hdset, Auto Answer [Hdset, Auto]
>
> **Headset/Handset Mute**
> **Programming Code:** *783
> **MLX Display Label:** Hdset, Mute
>
> **Headset Hang Up**
> **Programming Code:** *781
> **MLX Display Label:** Hdset, Hang Up (centralized
>   telephone programming only)
>
> **Headset Status**
> **Programming Code** *782
> **MLX Display Label:** Hdset, Status [Hdset, Stat]

Description

There are four Headset Options provided for MLX telephone users who have an optional headset adjunct:

■ Headset Auto Answer

■ Headset/Handset Mute

■ Headset Hang Up

■ Headset Status

Headset Auto Answer

Headset Auto Answer allows an MLX telephone user with a headset to be automatically connected to a ringing call. Headset operation must be activated before Headset Auto Answer can be used. Headset operation is activated automatically when a Headset Hang Up button is programmed during centralized telephone programming or manually when a user presses a programmed Headset Status button.

When Headset Auto Answer is activated, the user hears a tone for 400 ms through the headset to indicate an incoming call. Following the tone is a 500-ms pause, during which the transmit path is disabled to prevent the user's private conversations from being heard by the caller.

If the user is on a call or puts a call on hold, the Headset Auto Answer is deactivated and calls are not automatically answered until the caller hangs up or the user presses the Headset Hang Up button to disconnect the call.

Headset Auto Answer must be programmed on a button and can be used only on MLX telephones, digital direct-line consoles (DLCs), and queued call consoles (QCCs).

Headset/Handset Mute

Headset/Handset Mute allows an MLX telephone user to turn the microphone in the handset or headset on and off. The user can converse privately with another person without the caller hearing the conversation.

When headset operation is activated, pressing the Headset/Handset Mute button turns the headset microphone on and off. When headset operation is deactivated, pressing the Headset/Handset Mute button turns the handset microphone on and off. The green LED next to the button is on when the headset or handset microphone is off and off when the headset or handset microphone is on.

Headset/Handset Mute must be programmed on a button and can be used on MLX telephones, digital DLCs, and QCCs.

Headset Hang Up

With Headset Hang Up an MLX telephone user with a headset can disconnect calls manually. Headset Hang Up takes the place of the switchhook operation that is disabled when the telephone or console is in the headset operation mode.

When the Headset Hang Up button is programmed on the telephone or console, headset operation is automatically activated and the user can use a headset instead of a handset to answer calls. When the Headset Hang Up feature is removed from a button, headset operation is automatically deactivated.

To allow a user to manually activate and deactivate headset operation, a Headset Status button can be programmed in addition to the Headset Hang Up button. This allows the user to switch between using the handset and using a headset. To use Headset Hang Up when a Headset Status button is programmed, the user must press the Headset Status button to activate headset operation (the green LED next to the button goes on to indicate headset operation is active).

Headset Hang Up must be programmed on a button via centralized telephone programming only and can be used only on MLX telephones and digital direct-line consoles (DLCs). A Headset Hang Up button is not needed and cannot be programmed on a QCC.

Note: The user should deactivate headset operation before removing the Headset Hang Up feature from a button. If headset operation is active, the user exits telephone programming prematurely.

Headset Status

With Headset Status an MLX telephone user can manually activate and deactivate headset operation on the console or telephone. This allows the user to switch between using the handset and using the headset.

To use Headset Auto Answer, Headset/Handset Mute, or HeadSet Hang Up on a telephone with a Headset Status button programmed, the user first presses the Headset Status button to activate headset operation (the green LED next to the button goes on).

When the headset operation is activated, the switchhook operation for a handset is disabled and the headset can be used to make and answer calls. The user deactivates headset operation and switches back to the handset by pressing the Headset Status button again (the green LED next to the button goes off).

Headset Status must be programmed on a button and can be used only on MLX telephones, digital DLCs, and QCCs.

Note: The user should deactivate headset operation before removing the Headset Status feature from a button. If headset operation is active, the user exits telephone programming prematurely.

Telephone Differences

Multiline Telephones

Headset Options cannot be used on analog multiline telephones.

MLX Telephones

Headset Auto Answer

Before Headset Auto Answer can be used, headset operation must be activated either automatically following centralized programming of a Headset Hang Up button or manually by using a Headset Status button. Once headset operation is active, the user presses the programmed Headset Auto Answer button. The green LED next to the button is on when the feature is active and off when the feature is not active. The user cannot use feature codes to activate or deactivate Headset Auto Answer. MLX display telephone users can select the feature from the display only during programming.

Headset/Handset Mute

Before Headset/Handset Mute can be used to turn the headset microphone off, headset operation must be activated either automatically following centralized programming of a Headset Hang Up button or manually by using a Headset Status button. Once headset operation is active, the MLX telephone user turns the headset microphone on and off by pressing the programmed Headset/Handset Mute button. To turn the handset microphone on or off when a headset is not used, the user presses the programmed Headset/Handset Mute button.

The red LED next to the button is on when the headset or handset microphone is off and off when the headset or handset microphone is on. The user cannot use feature codes to activate or deactivate the feature. MLX display telephone users can select the feature from the display only during programming.

Headset Hang Up

Headset Hang Up cannot be programmed on a QCC. The QCC system operator with a headset uses the Release or Forced Release button to disconnect calls.

Before Headset Hang Up can be used, headset operation must be activated either automatically following centralized programming of a Headset Hang Up button or manually by using a Headset Status button. Once headset operation is active, the MLX telephone user or system operator (excluding the QCC system operator) disconnects a call manually by pressing the programmed Headset Hang Up button. The user cannot use feature codes to activate the feature.

Headset Status

To manually activate or deactivate the headset operation of the telephone or console, the MLX telephone user presses the Headset Status button. The green LED next to the button is on when the feature is active and off when the feature is not active. The user cannot use feature codes to activate or deactivate the feature. MLX display telephone users can select the feature from the display only during programming.

Note: A Headset Hang Up button cannot be assigned to a QCC. Therefore, the Headset Status button is the only way the QCC system operator can activate and deactivate headset operation.

Single-Line Telephones

The Headset options cannot be used on single-line telephones.

Considerations

■ Headset operation is automatically activated when a Headset Hang Up button is programmed and automatically deactivated when a Headset Hang Up button is removed. This occurs even if the user manually activated or deactivated headset operation before the Hang Up button was assigned via centralized telephone programming.

■ If a telephone or console (for example a QCC) does not have a Headset Hang Up button, the Headset Status button is the only way headset operation can be activated and deactivated.

■ Headset Auto Answer and Headset Hang Up do not work unless headset operation is activated either automatically following centralized programming of a Headset Hang Up button or manually by using a Headset Status button.

■ A headset, handset and speakerphone cannot be used at the same time.

■ The user should deactivate headset operation before the Headset Hang Up button or Headset Status is removed. If headset operation is active, the user exits telephone programming prematurely.

■ Headset Status button is also programmed by the telephone user or system operator (excluding QCCs).

■ Headset Status is a fixed feature on a QCC.

■ When a telephone or console has a Headset Hang Up button, Headset Status is needed only to manually activate and deactivate headset operation when the user wants to switch between using a headset and using a handset.

■ If a user with active Headset Auto Answer presses the button with a ringing call, the call is answered without the user hearing the tone.

■ Headset Auto Answer can be activated and deactivated during a call without disconnecting the caller and takes effect immediately.

■ A user with active Headset Auto Answer must manually select a line button or Call button before making an inside or outside call.

■ A user can press the Speaker button to move the call from the headset to the Speakerphone.

■ When two or more users answer the same call on a Shared System Access or Personal Line button, the red and green LEDs next to the button go on, but only one person has a talk path with the caller. The use of Privacy eliminates competition for the same call.

■ Headset Auto Answer does not automatically answer voice-announced calls.

■ When a user does not have a headset, the handset microphone can be turned off only when the user lifts the handset.

■ When a caller hangs up, the call is automatically disconnected and the use of the Headset Hang Up button is unnecessary.

Feature Interactions

Auto Dial   If headset operation is activated on the telephone or console, the user must select a line button before dialing an extension or an outside number using Auto Dial.

Automatic Line Selection   Automatic Line Selection does not work when an MLX telephone or console is in headset operation. A headset user must select a line manually before making a call.

Barge-In   If Barge-In is used to contact a user with Headset Auto Answer, the call is automatically answered.

Callback   Callback calls are answered automatically using Headset Auto Answer, but the user hears the Callback dequeuing tone instead of the Auto Answer tone. When both tailing and receiving users have headsets with Headset Auto Answer activated, the person being called hears zip tone when the Callback call is completed but the Callback originator does not hear zip tone or dequeuing tone.

Conference   Headset Auto Answer is disabled and must be reactivated manually while an MLX telephone user with a headset is setting up a conference.

Do Not Disturb	If the MLX telephone user with Headset Auto Answer uses Do Not Disturb, any calls that override Do Not Disturb (such as Barge-In calls and Callback calls) are automatically answered.
Hold	Headset Auto Answer is automatically deactivated when an MLX telephone user puts a call on hold and must be reactivated manually.
Paging	A user with a headset hears group speakerphone Paging over the speakerphone.
Park	If a call is parked, another call can be automatically answered by using Headset Auto Answer.
Privacy	Privacy should be programmed when headset users with Headset Auto Answer have Shared System Access buttons or share one or more personal lines. Privacy keeps the users from competing for the same call. When two or more users answer the same call on a Shared System Access or Personal Line button, the red and green LEDs next to the button go on, but only one person has a talk path with the caller.
Queued Call Console	Headset Auto Answer, Headset/Handset Mute, and Headset Status are fixed features on buttons on a QCC. Headset Hang Up cannot be programmed on a QCC. The function of disconnecting calls served by the Headset Hang Up feature is replaced with the Release, Forced Release, Camp-On, and Automatic Release features via DSS buttons on the QCC.
Ringing/Idle Line Preference	Ringing Line Preference does not operate if Headset Auto Answer is disabled while the MLX telephone is in the headset operation mode. To answer a call, the user must press the button next to the ringing call. When the telephone or console is in the headset operation mode, Idle Line Preference does not operate, and the user must manually select a line button before making an inside or outside call.
Ringing Options	Headset Auto Answer does not automatically answer calls ringing on buttons programmed for no ring on an MLX telephone; the user must manually select the button to answer the call. When Abbreviated Ring is enabled, the user hears the abbreviated ring if another call rings while the user is on a call.
Transfer	When an MLX telephone user (excluding a QCC system operator) transfers a call, Headset Auto Answer is deactivated and must be reactivated manually unless the user releases the call by using the Headset Hang Up button.

Hold

Extension Programming	**Feature Codes:**
	Hold 771
	Hold Release **

Description

Hold allows a user to leave a call temporarily to take a second call, retrieve information, activate a feature (such as Conference), or greet a visitor.

When a user (excluding a QCC system operator) puts an outside call on hold, the green LED next to the line button flashes at a faster rate to distinguish the call from calls put on hold by other users. The caller hears Music-On Hold, if programmed, or nothing. If the call is not picked up within one minute for regular users, the user hears a reminder.

When a caller on hold hangs up, there is either a short (50-ms) or long (450-ms) Hold Disconnect Interval. The interval can be set to match that of the telephone company's central office.

Two Hold options are available for direct-line console (DLC) system operators. A queued call console operator can use only the Operator Hold Timer.

■ **DLC Operator Automatic Hold** — when enabled, provides more efficient call handling and prevents accidental disconnection of callers. When a DLC system operator who is on a call presses another line button, an Auto Dial button, or a Direct Station Selector (DSS) button, the caller is automatically put on hold.

■ **Operator Hold Timer** — reminds the DLC or QCC system operator of a call on hold. The system operator hears an abbreviated ring if a call is not picked up within the amount of time programmed for the system (10-255 seconds); the factory setting is 60 seconds. If a call is ringing on the console at the same time the timer expires, 10 seconds are added to the timer interval.

Telephone Differences

Multiline Telephones

Multiline telephones have built-in Hold buttons. In addition, when Operator Automatic Hold is enabled, a caller is put on hold automatically when the system operator selects another line button or presses an Auto Dial or DSS button. For a QCC, if the Operator Hold Reminder timer expires twice, the call can either remain on hold at the console or return to the queue. See the Hold Return option for the Queued Call Console for more information.

Single-Line Telephones

Users at single-line telephones can put calls on hold by pressing and releasing the switchhook quickly ("switchhook flash"). If the switchhook is pressed longer than half a second, the call may be disconnected.

A single-line telephone user with a built-in Recall button can press the button to transmit a timed switchhook flash about one-half second long.

Considerations

- ■ The factory setting for the Hold Disconnect Interval is the long interval (450 ms) since it is the interval used by most telephone companies.

- ■ If the Hold Disconnect Interval of the system does not match that of the central office, the system may have the following problems with calls on hold:

  - ■ If the interval is shorter than the setting at the local central office, callers on hold may be disconnected.

  - ■ If the interval is longer than the central office's, the LED next to the line button continues to flash after a caller on hold hangs up.

- ■ If two users—for example, stations A and B—who share a Personal Line or with Shared System Access buttons, put a call on hold and a third user—for example, station C—who also shares the line or System Access button, picks up the call, the LED next to the button continues to flash at stations A and B (it does not change to steadily lit) and does not indicate that station C is active on the call. If station C hangs up, the LED next to the button goes off on all stations.

- ■ Both sides of an inside call cannot be put on hold. Therefore, if a user presses the Hold button while waiting on hold on an inside call, the call is disconnected.

Feature Interactions

Auto Dial

The Hold button is pressed to enter the Pause special character in a telephone number programmed on an Auto Dial button.

Callback

Pressing the Hold button while waiting for a queued call is the same as hanging up—the call is disconnected. If a system operator presses another line button, an Auto Dial button, or a DSS button while waiting on the line for a queued call, the call is disconnected—Automatic Hold does not work.

Call Waiting

A person with all calls on hold cannot hear the Call Waiting tone.

Conference

The conference originator receives the hold reminder when the conference is on hold for more than one minute as a result of using the Hold button or while adding other participants. If DLC Operator Automatic Hold is programmed and used by a DLC system operator while setting up a conference, the entire conference goes on hold.

Both sides of an inside call cannot be put on hold. Therefore, if a user presses the Hold button while waiting on hold for a conference initiated by another user (an inside call) or if the user presses the Conference button while waiting on hold on an inside call, the entire conference call is disconnected.

Coverage   Coverage calls answered by any type of receiver can be put on hold. The Hold
                                Reminder applies to any calls put on hold on a Primary Cover, Secondary
                                Cover, or Group Cover button.

Direct-Line Console   When programmed system wide, DLC Operator Automatic Hold puts an active
                                call on hold when the DLC system operator presses another line button. When
                                One-Touch Hold is programmed system wide, pressing an Auto dial button or
                                DSS button also puts an active call on hold. This prevents accidental
                                disconnection of callers and speeds call handling.

                                The DLC system operator hears an abbreviated ring as a reminder of a call on
                                hold every time the interval programmed for the Operator Hold Timer (10-255
                                seconds) expires.

Directory   The Hold button is pressed to enter the Pause special character in a directory
                                listing telephone number.

Disallowed Lists   The Hold button is used to enter a wild card character in a Disallowed List entry.

Display   When a user with an MLX telephone has a call on hold for a longer period of
                                time than the programmed Hold Reminder, a message appears on the display.

                                On a queued call console (QCC) only, when held calls return to the queue after
                                the second hold reminder, returning held calls are identified by call type and by
                                the name and extension number of the system operator who put the call on hold.
                                The second line of the QCC display also shows the caller information.

Group Calling   A calling group member who put a call on hold using the Hold button is
                                considered unavailable for incoming calls. A user waiting in the calling group
                                queue cannot put the call on hold.

Headset Options   Headset Auto Answer is automatically deactivated when an MLX telephone user
                                puts a call on hold.

Inspect   If the user presses the Hold button while Inspect is activated, Inspect is
                                canceled and the system tries to put the call on hold.

Multi-Function Module   Calls cannot be put on hold on an MFM since the system ignores the switchhook
                                flash.

Paging   A Speakerphone Paging call can be put on hold by the originator only. However,
                                when Speakerphone Paging is used to make an inside voice-announced call,
                                either the originator or the person being called can put the call on hold.

Park

If a single-line telephone user with a call on hold hangs up, the call is disconnected; therefore Park should be used instead of Hold. When a user or system operator parks a call received on a Personal Line button and it is picked up at another telephone and put on hold via the Hold button, other users who share the personal line cannot press the line button and pick up the call.

Personal Lines, Pickup, and Transfer

Calls on hold for transfer are timed so that the user or system operator hears a reminder tone after the timer expires.

If a call is received on a personal line and is transferred to another user who receives the call on a System Access or intercom button and puts the call on hold, another user who shares the line cannot select the shared Personal Line button and pick up the call. If for some reason the person who received the transfer and put the call on hold cannot return to the call, another user must use the line Pickup feature to pick up the call (for example, a system operator can take a message and disconnect the caller).

Queued Call Console

Pressing the Hold button to put a caller on hold makes the system operator available for incoming calls from the QCC queue. The Operator Hold Timer reminds the QCC system operator that a call is on hold. After a programmed interval (10-255 seconds) the system operator hears an abbreviated ring as a reminder when the interval expires the first time. If another call is received at the same time the hold timer expires, 10 seconds are added to the programmed Operator Hold Timer interval.

If the QCC system operator does not pickup a call by the time the hold timer expires twice, the call can be programmed to either remain on hold or return to the QCC queue. When the QCC Hold Return Option is set for calls to remain on hold indefinitely, every time the interval expires and no call is ringing on the console, the system operator hears the ring. If the QCC Hold Return Option is set for calls to return to the queue, each call on hold at the QCC is timed individually (a queue return timer is used for each Call button).

The DLC Operator Automatic Hold feature is not used for QCCs.

Recall

The single-line telephone user with a Recall button presses the Recall button to put a call on hold.

Speed Dial

The Hold button is pressed to enter the Pause special character in Personal Speed Dial or System Speed Dial telephone number.

System Access

In the Hybrid/PBX mode, if a call is put on hold on a System Access or Shared System Access button, it can be picked up at the principal's System Access button or at any other Shared System Access button programmed for the specific button with the held call unless the Privacy feature is used. Hold Reminder is heard only by the station that put the call on hold.

System Programming

■ Change the Hold Disconnect Interval (factory setting is long-45 ms).

```
Lines/Trunks -> More -> Holdlscnct
```

■ Enable or disable DLC Operator Automatic Hold feature for all DLC system operators. The feature cannot be assigned to individual system operator positions. The factory setting is disabled.

```
Operator -> DLC Hold
```

■ Change the Operator Hold Timer from the factory setting of 60 seconds to 10-255 seoonds. The feature cannot be assigned to individual DLC system operator positions and is applicable to both DLCs and QCCs.

```
Operator -> Hold Timer
```

Inside Dial Tone

Description

The system's inside dial tone is heard when a user lifts the handset or presses the Speaker button after an Intercom or System Access button is selected. Two choices are available for inside dial tone:

■ **System internal dial tone** makes it easy to distinguish an inside line from an outside line.

■ **Outside dial tone** is required by some software applications that do not recognize internal dial tone, such as voice messaging systems or modems connected to the system. With this setting, inside dial tone sounds the same as outside dial tone.

System Programming

As needed, change the factory-set distinctive inside dial tone to be the same as outside dial tone.

```
Options -> InsideDial
```

Inspect

Description

Inspect allows an MLX display telephone user who is on a call to see call information about another call that is ringing or on hold. Call information includes whether it is an inside or outside call, any programmed labels for the caller (such as the inside caller's name or the label assigned to the outside line), and how the call came to the user (transferred, coverage call, forwarde, etc.). Inspect can also be used to inventory what is programmed on the telephone's line and feature buttons.

To use Inspect, the user presses the Inspect button and then presses a line button. The call information or feature programmed on the button appears on the Inspect screen, as shown in Figures 2-13 and 2-14 below.
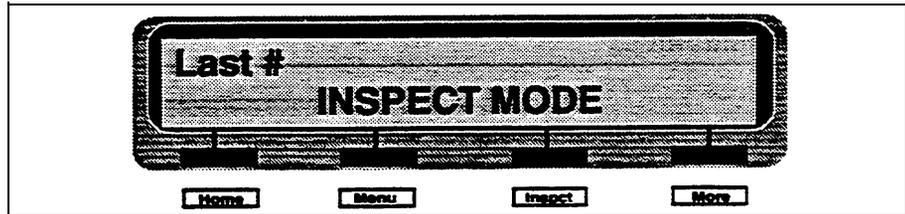
Figure 2-13   2-Line Display Inspect Screen for Programmed Button
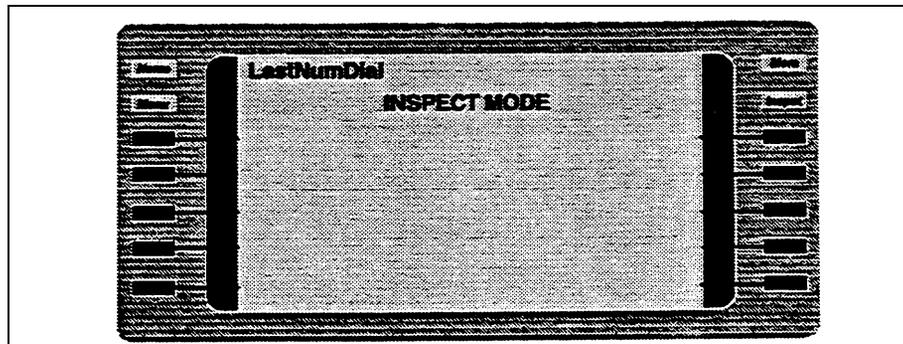
Figure 2-14   7-Line Display Inspect Screen for Pragrammed Button

Telephone Differences

Multiline Telephones   To use Inspect to screen incoming calls while on another call or to identify callers on hold on the telephone, the MLX display telephone user presses the Inspect button and then presses the line button with the ringing or held call. The call information is displayed. To Inspect a programmed button, the user presses the Inspect button and then presses the programmed button. The name of the feature programmed on the button is displayed.

Inspect cannot be used on MLX telephones without display or on analog multiline telephones.

Single-Line Telephones   Inspect cannot be used on single-line telephones.

Considerations

■   If the company subscribes to special services, such as AT&T's INFO2 automatic number identification (ANI) service, the user can see the outside telephone number of the person calling.

     Note: The availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or CO equipment.

■   If a line button is being inspected, it cannot be used to make or receive a call.

■   If a user inspects a line that someone else is using, the display shows that the line is in use.

■   If Inspect is activated and someone makes a voice-announced call or a Group Page to the user, the inspect feature is canceled and the Home screen is displayed.

■   If the user presses the Feature button or Menu button while Inspect is activated, Inspect is canceled.

Feature Interactions

Alarm   Inspect can be used on an MLX DLC or a QCC to display the number of alarms; an analog DLC cannot use Inspect.

Conference   If the user presses the Conference button while Inspect is activated, Inspect is canceled and the system tries to activate the Conference feature.

When a conference participant joins a conference using a shared outside line or Shared System Access button, the queued call console (QCC) display reflects the correct number of participants. However, if the QCC system operator uses the Inspect feature to verify the number of participants, the number shown on the display does not include participants joining the conference on a shared button.

Direct Station Selection   Inspect can be used to determine the corresponding extension for each DSS button. To use Inspect, the user presses the Page button for the range of extensions, presses Inspect, and presses each individual DSS button to see the contents. The user can display information on only one page number at a time; to see information for another range of extensions, the user must press the Home button and repeat the process.

If a message is posted at an extension associated with a DSS button, the message is shown on page 2 of the display when the system operator inspects the DSS button.

Group Calling

Any MLX telephone user can inspect the number of calls in the calling group queue by pressing Inspect and then pressing a button programmed with the calling group's extension. The display shows the label associated with the calling group and the number of calls.

Hold

If the user presses the Hold button while Inspect is activated, Inspect is canceled and the system tries to put the call on hold.

Paging

If the user gets a voice-announced inside call or a Group Speakerphone Page while using the Inspect feature, the inspect feature is canceled and the user is returned to the Home screen.

Queued Call Console

When a conference participant joins a conference by using a shared outside line or Shared System Access button, the QCC display reflects the correct number of participants. However, if the QCC system operator uses the inspect feature to verify the number of participants, the number on the display does not include participants joining the conference on a shared button.

If a QCC system operator presses any of the buttons programmed with fixed QCC features (for example, a Call, Start, or Source button) while in the Inspect mode, the console remains in Inspect mode. However, if the operator presses the Feature, Transfer, HFAI, Conf, Mute, Drop, Speaker, or Hold buttons, the console is removed from the Inspect mode.

Transfer

If a user presses the Transfer button while inspect is activated, inspect is canceled and the user is returned to the Home screen.

Labeling

Description

Through the use of Labeling, a central file of identification information and messages (called "labels") can be established. The labels are used for the call information shown on display telephones. Alphanumeric labels can be assigned to the following:

- ■ **Outside lines/trunks** to identify the type of line/trunk (for example, WATS or tie trunk), the telephone number, or the department to which the line/trunk belongs. This information is displayed when a user makes or receives a call.

- ■ **Extensions** to identify the name of the person or room (for example, a conference room) associated with the extension. This information is displayed when a user receives an inside call, when a co-worker leaves a message, or when a user accesses the Extension Directory.

- ■ **Calling groups** to identify the group. This information is displayed only when inspect is used to view an Auto Dial button programmed with the calling group's extension.

- ■ **System Speed Dial numbers** to identify the company or person associated with the number. This information is displayed when a user accesses the System Directory.

Labeling is also used to create posted messages, which can be used to explain why a person is not answering his or her telephone. Up to 20 posted messages can be programmed; 10 are factory set but can be changed, and 10 additional messages can be created.

See "Messaging" section for more on how to post a message.

Each posted message has a code. To post a message, a user enters the message's code. When another user with a display telephone calls, the message is displayed on the caller's telephone.

The following table lists the factory-set posted messages and their codes.

Table 2-12 Factory-Set Posted Messages and Their Codes

Code	Message
01	DO NOT DISTURB
02	OUT TO LUNCH
03	AT HOME
04	OUT SICK
05	IN A MEETING
06	IN A CONFERENCE
07	WITH A CLIENT

Table 2-12 Continued

Code	Message
08	WITH A CUSTOMER
09	AWAY FROM DESK
10	OUT ALL DAY
11-20	CUSTOM MSG (nn)

Telephone Differences

Programmed labels cannot be shown on MLX or analog multiline telephones without a display, or on single-line telephones.

Considerations

■ If a label is not assigned to an extension, and a user leaves a message on another telephone, the telephone's extension number is displayed instead of the user's name. For example, an analog multiline display telephone user sees "Call x1234" instead of "Call Wayne" on the display, and an MLX display telephone user sees "* x1234 11:03" instead of "* Wayne 11:03."

■ If labels are not assigned to system operator extensions, display telephone users see "Operator" and the system operator's extension when receiving a call from the system operator.

■ If labels have not been assigned to outside lines/trunks, display users see the factory-set label of "OUTSIDE" and the line/trunk number (such as Trk 810) when an outside call is made or received.

■ The label for outside lines/trunks can contain eight types of characters: (capital letter, numbers, ampersand [&], dash, space, colon, asterisk [*], and pound sign [#]).

■ With AT&T's INFO2 automatic number identification (ANI) service, the information displayed also identifies the number of the caller.

   Note: The availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or central office equipment.

■ The label for extensions can contain seven alphanumeric characters.

■ The label for calling groups can contain seven alphanumeric characters.

■ Posted Messages can contain 16 alphanumeric characters.

■ The system can have up to 20 posted messages. Ten messages are preset at the factory and can be overwritten to create 20 custom messages.

■ The label for a System Directory listing can contain a maximum of11 alphanumeric characters.

Feature Interactions

Directory

Labeling is used to enter names of people, groups, and locations associated with the extensions in the system that are stored as listings in the Extension Directory. Labels (such as the name of a person or a business) associated with System Speed Dial numbers are also entered by using the Labeling feature and stored as listings in the System Directory. Labels for lines/trunks are shown on the display when outside calls are made and received.

Users with MLX display telephones search for a name in the Directory and then press the display button associated with it to automatically dial the number.

Group Calling

An alphanumeric label can be assigned to the calling group. The label is displayed only when an MLX display telephone user presses the Inspect button and an Auto Dial button programmed with the calling group's extension number.

Messaging

The labels stored in the Extension Directory appear on MLX display telephones when users send each other messages. Messages include the name (the seven-character label) of the user who sent the message and the time and day the user called.

Posted messages are created and changed by using Labeling.

Speed Dial

The telephone numbers associated with System Speed Dial codes are programmed by using the same series of programming screens as those used to program labels for System Directory listings.

System Programming

■ Assign outside line/trunk labels.

```
More -> Labeling -> LinesTrunks
```

■ Create, change, or delete System Directory listing (System Speed Dial).

```
More -> Labeling -> Directory -> System
```

■ Assign extension labels.

```
More -> Labeling -> Directory -> Extension
```

■ Create, change, or delete individual Personal Directory entries (individual MLX-20L user can also program from the telephone).

```
More -> Labeling -> Directory -> Personal
```

■ Assign calling group labels.

```
More -> Labeling -> Grp  Calling
```

■ Change existing posted messages or add new posted messages.

```
More ->  Labeling -> PostMessage
```

Last Number Dial

Extension Programming

> **Programming Code:** *84
> **Feature Code:**   84
> **MLX Display Label:** LastNumDial [Last*]

Description

Last Number Dial automatically saves the last number dialed from a multiline telephone and allows the user to call the number again without manually redialing. The number is saved even if the person being called answers.

The number saved is any extension or telephone number dialed by:

■ Manually dialing the complete number on the dialpad

■ Dialing the number by using a Personal Speed Dial code

■ Dialing a number by using a programmed outside Auto Dial button

Each time the user dials a new number by using any of these methods, the old number saved on last Number Dial is erased and replaced with the new number.

Telephone Differences

Multiline Telephones

To redial a number by using Last Number Dial, the multiline telephone user selects the appropriate Personal Line (outside line) or System Access button (Hybrid/PBX only) for the call and then either presses the programmed Last Number Dial button, or presses the Feature button and dials 84. The number saved by the feature is dialed automatically. On MLX display telephones, the user presses the Feature button and selects the Last Number Dial from the display.

Single-Line Telephones

To redial a number by using Last Number Dial, the single-line telephone user lifts the handset (while listening to internal dial tone) and dials #84. The number saved by the feature is dialed automatically.

Mode Differences

Behind Switch

In the Behind Switch mode, when a user manually dials an outside number that includes a dial-out code (for example an Automatic Route Selection or pool dial-out code) required by the host system, the pauses required to wait for dial tone from some host systems are not automatically stored when list Number Dial is used. As a result, the user may either hear a fast busy signal or reach a wrong number when using last Number Dial.

Considerations

- Only one Last Number Dial button can be programmed on each multiline telephone.

- A maximum of 16 digits is saved by Last Number Dial.

- Since the type of line button (Personal Line or Intercom/System Access) used to make the call is not stored, the user must select the appropriate line button before using Last Number Dial to redial a number.

- If the user dials an incomplete number, the digits are saved.

- If a user dials a telephone number and, after the call is connected, dials additional digits such as an account number or password, Last Number Dial saves all digits, including those dialed after the call is connected. In addition, if someone other than the owner of a display telephone presses the last Number Dial button, all dialed digits are shown on the display, including confidential information such as passwords or account codes.

- Last Number Dial does not store numbers dialed via an Extension, Personal or System Directory, inside Auto Dial button, System Speed Dial code, or a DSS button.

- If the number is dialed by using an outside Auto Dial button or Personal Speed Dial code and includes a special character such as Pause or Stop, the special character does not work when the number is redialed by using Last Number Dial.

Feature Interactions

Auto Dial
A number dialed by pressing a programmed outside Auto Dial button is saved for Last Number Dial as if it were dialed with the dialpad, but special characters do not work. An extension dialed by pressing a programmed inside Auto Dial button is not saved for last Number Dial.

Directory
Last Number Dial does not store a number dialed using a Personal, Extension or System Directory.

Direct Station Selector	An extension dialed by pressing a DSS button is not stored for last Number Dial.
Display	When a user presses a programmed Last Number Dial button, the digits appear on the display as if the user were dialing them from the dialpad.
Microphone Disable	When an MLX telephone user's microphone is disabled, pressing a Last Number Dial button before lifting the handset turns on the speakerphone so the user can hear the number being dialed. However, the user must lift the handset to talk once the call is answered.
Queued Call Console	Last Number dial cannot be used on a QCC.
Speed Dial	Telephone numbers that are dialed by using a Personal Speed Dial are stored by Last Number Dial. If the number includes a special character such as pause or stop, the special characters do not work when the number is redialed by using last Number Dial. Telephone numbers that are dialed by using a System Speed Dial code are not stored by Last Number Dial.
Station Message Detail Recording	All numbers dialed on an outside call by using Last Number Dial are recorded on the SMDR report.
System Access	In the Hybrid/PBX mode, if the Last Number Dial feature is used on a Shared System Access button, the number is stored on the telephone that used Last Number Dial and not on the principal station.
Transfer	Last Number Dial can be used to dial the outside number of the telephone to which the call is being transferred.

Related Features

■ Saved Number Dial

Line Request

Description

If a user wants to make a call on a personal line (outside line assigned to a button) that is busy (the green LED next to the button is on or flashing), Line Request notifies the user when the line is available.

Line Request is automatically available and does not require programming. To request the busy line, the multiline telephone user simply presses the line button for the busy line without lifting the handset. The red LED next to the line button goes on, and when the line becomes available, the telephone automatically alerts the user with a beep. To make a call using the requested line, the user simply lifts the handset or presses the Speaker button.

Line Request is canceled if the user presses another line button or makes or receives a call.

Telephone Differences

Multiline Telephones
Line Request cannot be used on an MLC-5 (cordless) telephone or a queued call console (QCC).

Single-Line Telephones
Line Request cannot be used with single-line telephones.

Mode Differences

Hybrid/PBX
In the Hybrid/PBX mode, Line Request can be used for personal lines, or special purpose lines (such as WATS) assigned to line buttons on a multiline telephone. Callback is used instead of Line Request to complete calls to busy extensions or outside numbers when the call is made by using a pool in which the trunks in the pool are busy.

Key and Behind Switch
Line Request only works for outside lines that are assigned to line buttons.

Considerations

■ Line Request does not reserve the line for the user; it only alerts the user that the line is available.

■ Line Request cannot be used for an intercom or System Access button.

Feature Interactions

**Callback,
Camp-On,
Park, and
Transfix**

Returning Callback, Camp-On, Park, and Transfer calls cancel Line Request.

Pools

Line Request cannot be used for a Pool button or for a busy pool in the Hybrid/PBX mode.

Queued Call Console

Line Request cannot be used on a QCC.

System Access

Line Request cannot be used for an Intercom or System Access button.

Related Features

■ Callback

Messaging

Extension Programming

Programming Codes:
 Leave Message: *25
 Posted Message   *751
 Send/Remove Message: *38 (system oeprators only)
 Analog Display Telephones only:
  Delete Message: *26
  Next Message: *28
  Return Call: *27
  Scroll: *29
Feature Codes:
 Cancel Message Sent: *53 + extension number
 Leave Message:
   After calling receiver: 25
   Without calling receiver: 53 + extension number
 Message LED Off: 54
 Send/Remove Message: 38 + extension number
                       (system operators only)

 Analog Display Telephones only:
  Delete Message: 26
  Next Message: 328
  Return Call   27
  Scroll: 29
MLX Display Label:
 Delete Message: Messages, Delete [Msgs, Dlete]
 Leave Message: Msg Leave [LvMsg]
 Next Message: Mesages, Next [Msgs, Next]
 Return Call: Messages, Return Call
                    [Msgs, Call]

Description

Messaging features allow users to

■ Send messages

■ Receive messages

■ Post messages

Sending Messages

The features used to send messages are

■ Send/Remove Message—for system operators only

■ Leave Message—for any user to leave a message for a co-worker with a display telephone or for any co-worker when the system includes a voice messaging system

Send/Remove Message

The Send/Remove Message feature, available only to system operators, is used to turn the Message LED on and off for any telephone connected to the system. For telephones without a display, Send/Remove Message is the only way the Message LED can be turned on unless the telephone is programmed as the message-waiting receiver for a fax machine or calling group, or the system has a voice messaging system connected.

A Send/Remove Message button is factory assigned to queued call consoles (QCCs), to MLX-28Ds used as a direct-line consoles (DLCs), and to analog DLCs when the system has fewer than 32 lines. On a DLC, Send/Remove Message is not a fixed feature and can be assigned to any available button via extension or centralized telephone programming. On a QCC, the feature is fixed and cannot be reassigned.

On QCC or digital DLC consoles with a Direct Station Selector (DSS), or on a MERLIN II System Display Console with a built-in DSS, the system operator can use the LEDs next to the DSS buttons to determine whether a system operator turned the Message LED on. Before sending a message, the system operator presses the Message Status button and checks the LED next to the receiver's DSS button; the LED is on when a message is waiting from a system operator and off if no message is waiting. The LEDs on the DSS do not reflect whether Message LEDs were turned on by using the Leave Message feature, voice messaging system, fax arrival, or a message left for a calling group.

When the LED next to a DSS button is on and the system operator uses the Send/Remove Message feature, the user's message LED is turned off. When the LED next to a DSS button is off and the system operator uses the Send/Remove Message feature, the user's Message LED is turned on.

A DLC system operator without a DSS can check message status by using Auto Dial buttons programmed with extension numbers. The red LED next to an Auto Dial button indicates whether the Message LED is on. A QCC system operator without a DSS cannot check message status. If a system operator who cannot check status sends a message, that message can cancel a message waiting indication sent by another system operator.

Leave Message

The Leave Message feature allows any user (including system operators) to send messages to co-workers with display telephones or, when the system includes a voice messaging system (such as the MERLIN MAIL™ Voice Messaging System), to send messages to any telephone.

When the user calls a co-worker with a display telephone and receives a busy signal or no answer, the user presses a programmed Leave Message button or for MLX display telephones, selects the feature from the display. A "call me" message is sent to the display telephone user. The "call me" message includes the sender's name (if labels are programmed) and/or extension, and the time and date the sender called.

The Leave Message feature can also be used to send a message to a co-worker without a display only when the system includes a voice messaging system. When Leave Message is used, the voice messaging system creates a pre-programmed message and turns on the co-worker's Message LED to indicate that a voice message was left.

If the message sender leaves another message for the same person before the message receiver responds to a previous message, the previous message is overwritten. A receiver with a display telephone sees only the sender's name (if labels are programmed) and/or extension and date and time for the new message. If the message is sent by using the voice messaging system, the message receiver only receives the most recent message.

When the system does not include a voice messaging system and a user with any telephone tries to use the Leave Message feature to send a message to a person with a single-line telephone or a multiline telephone without a display, the sender hears a single beep indicating that a message must be left with the system operator. If the message sender has a display telephone, the message "Cannot Send Message" is displayed.

When a user tries to send a message by using the Leave Message feature for a co-worker with a display telephone whose message box is full, the receiver's telephone continues to ring and the sender's telephone beeps once. If the sender has a display telephone, "Message Box Full" is displayed, and the sender must leave a message with the system operator instead.

Users can cancel a sent message by pressing the Feature button and dialing *53 plus the extension where they left the message.

Receiving Messages

When the Message LED on a user's telephone is on or when a single-line telephone user hears the recall dial tone when lifting the handset, there is a message waiting for that person or for the calling group (if the telephone is programmed as a Message Waiting Receiver for a calling group). The message can be from the following sources:

■ The system operator

■ The voice messaging system, if connected

■ A fax machine if the telephone is programmed as a Message Waiting Receiver for a fax

■ Another user if the message receivers telephone has a display

From one to four telephones can be designated to receive message-waiting indications when a fax transmission is received on a specific fax machine. The Message LED is turned on when the fax message threshold is exceeded. The fax message threshold is the length of time (0-30 seconds) before the system assumes a fax has arrived.

Note: Fax machines can only send message-waiting indication. They cannot receive message-waiting indication from other fax machines.

Also, a telephone can be programmed as the message-waiting receiver for a calling group. The user can receive personal messages or messages intended for the calling group from any of the above sources.

When the Message LED is on and the user does not have a display telephone, he or she must check with potential senders to get the message. When all messages are retrieved, the user can turn the LED off by dialing a feature code. The Message LED goes off even if the message waiting indication was sent by more than one source (such as the system operator and a fax machine).

A user with a display telephone can press a programmed button or use the display to read messages. The return call function allows the display telephone user to call the message sender with the press of a button.

Display telephones store up to 10 messages and display them in reverse order of how they were received—the most recent message is displayed first. Each message is identified on the display as follows:

*	New message that has not been displayed before
A	Message from the system operator (attendant)
F	You have a fax
V	Message on the voice message system

Posted Messages

See "labeling" in this chapter for more on creating Posted Messages.

Users can post a message to provide special information to co-workers with display telephones-for example, where the person is when not answering the telephone or why the person does not want to be disturbed. When a user with a display telephone calls a co-worker with a message posted, the posted message is shown on the caller's display (even if the call is answered). Users do not have to have a display telephone to post a message.

Twenty different posted messages can be programmed in the telephone system. Ten are programmed by the factory, but can be changed, and ten more can be programmed.

01 DO NOT DISTURB	06 IN A CONFERENCE	11 CUSTOM MSG 11	16 CUSTOM MSG 16
02 OUT TO LUNCH	07 WITH A CLIENT	12 CUSTOM MSG 12	17 CUSTOM MSG 17
03 AT HOME	08 WITH A CUSTOMER	13 CUSTOM MSG 13	18 CUSTOM MSG 18
04 OUT SICK	09 AWAY FROM DESK	14 CUSTOM MSG 14	19 CUSTOM MSG 19
05 IN A MEETING	10 OUT ALL DAY	15 CUSTOM MSG 15	20 CUSTOM MSG 20

Telephone Differences

Multiline Telephones

Send/Remove Message — System Operators Only

Before using the Send/Remove Message feature to turn a Message LED on or off, the QCC, MLX DLC, or MERLIN II System Display Console system operator presses the Message Status button on the DSS and checks the LED next to the receiver's DSS button to determine whether a system operator turned the Message LED on. A DLC system operator without a DSS can check message status by using Auto Dial buttons programmed with extension numbers. The red LED next to an Auto Dial button indicates whether a system operator turned the message LED on:

■ To leave a message if the LED is off, the system operator presses the programmed Send/Remove Message button, followed by the DSS or Auto Dial button for the message receiver. The system operator with a DSS adjunct or a built-in DSS presses Message Status to return to normal call handling. MLX DLC system operators can also press the Feature button and select the feature from the display.

   Note: If the system operator sends a message while on a call, only an inside caller hears the touch-tones; an outside caller does not.

■ If the LED is on (indicating that a system operator already turned on the Message LED), the system operator takes no action. If the system operator uses the Send/Remove Message feature, the Message LED is turned off. The system operator with a DSS adjunct or built-in DSS presses the Message Status button to return to normal call-handling.

To cancel a message-waiting indication (turn the Message LED off), the QCC or DLC system operator with a DSS adjunct or built-in DSS presses the Message Status button and checks the LED next to the receiver's DSS button. The DLC system operator without a DSS adjunct checks the LED next to an Auto Dial button programmed for the user:

■ If the LED is on, the system operator presses the programmed Send/Remove Message button followed by the DSS or Auto Dial button for the message receiver. The system operator with a DSS adjunct or built-in DSS presses the Message Status to return to normal call handling. MLX DLC system operators can also press the Feature button and select the feature from the display.

   Note: If the system operator cancels a message while on a call, only an inside caller hears the touch-tones; an outside caller does not.

■ If the LED is off (indicating that a system operator did not turn on the Message LED), the system operator takes no action. If the system operator uses the Send/Remove Message feature, the Message LED is turned on. The system operator with a DSS adjunct or built-in DSS presses the Message Status button to return to normal call handling.

A QCC system operator without a DSS cannot check message status. If a system operator who cannot check status sends a message, a message waiting indication sent by another system operator can be canceled.

Leave Message

To use the Leave Message feature while listening to ringback or the busy tone, the multiline telephone user (except a QCC system operator) presses a programmed Leave Message button or presses the Feature button, and dials 25. QCC system operators and MLX display telephone users press the Feature button and select the feature from the display while listening to ringback or busy tone.

To use the Leave Message feature without calling a user, the multiline telephone user (without lifting the handset) presses the Feature button, dials 53 and the message receiver's extension number. QCC system operators cannot use Leave Message without calling the message receiver.

Note: If the message receiver's Message LED is already on, using the Leave Message feature does not turn the LED off even if a system operator uses Leave Message to send a message to a display telephone user.

If the receiver's message box is full or the receiver has a single-line telephone or a multiline telephone without a display, the user hears a beep indicating that the message was not left.

Multiline display users see "Message sent to . ..", "Message Box Full," or "Cannot Leave Message" on the display to indicate the status of the message sent. A DLC or a QCC system operator can also send messages this way, but the QCC system operator must select the feature from the display since feature codes cannot be used and no buttons can be programmed on the console.

To cancel a message previously sent, the multiline user presses the Feature button, dials *53 and the extension number where the message was left. QCC system operators cannot cancel messages sent.

Responding to Messages

An MLX display telephone user (including a QCC system operator) can read messages by pressing the Menu button and selecting Messages from the display. The first line of the most recent message received is shown on the display. To see the rest of the message, the user presses More. To see the next message, the MLX display telephone user selects Next Message from the display.

To return the call, the MLX display telephone user (including a QCC system operator) selects Return Call from the display. The message sender's extension is dialed automatically. To delete the message, the user selects Delete Message from the display. The Message LED goes off when all messages have been deleted.

An analog multiline telephone user can read messages by pressing the Message button. The first message received is shown on the display. If the message is longer than one line, the user presses a programmed Scroll button or presses the Feature button and dials 29. To see the next message, the user presses a programmed Next Message button or presses the Feature button and dials 28.

To return the call, the user presses a programmed Return Call button or presses the Feature button and dials 27. To delete the message, the user presses a programmed Delete Message button or presses the Feature button and dials 26. The Message LED goes off.

Multiline telephone users without a display cannot use programmed message buttons or feature codes to respond to messages. Normally, the Message LED is turned off by the system operator. However, an analog multiline telephone user (excluding BE-34 telephones) can turn off the Message LED by pressing the associated button. An analog multiline telephone user with a BIS-34 telephone and MLX telephone users without a display can turn off the LED by pressing the Feature button and dialing 54.

The user should check with all message sources (system operator, fax, voice messaging) before turning off the LED.

Posted Messages

To post a message, the user with an analog multiline telephone or an MLX telephone without a display presses the programmed Posted Message button (the green LED next to the programmed button flashes) and dials the code (01-20) (the green LED next to the button is steady) for the message the user wants posted. To cancel a posted message, the user presses the programmed Posted Message button and dials 00 (the green LED next to the programmed button goes off). An MLX display telephone user (including a QCC system operator) uses the feature by pressing the Feature button and selecting the feature and the message to post from the display.

Single-Line Telephones

Leave Message

To use the Leave Message feature while listening to ringback or the busy tone, the single-line telephone user dials #25.

To use the Leave Message feature without calling the extension, the single-line telephone user lifts the handset and dials #53 and the message receiver's extension number.

In either case, if the receiver's message box is full or the message has a single-line telephone or a multiline telephone without a display, the user hears a beep indicating that the message was not left.

To cancel a message sent, the single-line user lifts the handset (while listening to internal dial tone) and dials #*53 and the extension number where the message was left.

Responding to Messages

Single-line telephone users without a Message LED hear a recall dial tone when a message is waiting. A single-line telephone user cannot respond to messages by using feature codes. Normally, if a single-line telephone has a Message LED, it is turned off by the system operator. However, a single-line user can turn off the Message LED by lifting the handset (while listening to internal dial tone) and dialing #54. The user must check with all message sources (system operator, fax, voice messaging) before turning off the LED.

Posted Messges

A single-line telephone user cannot post a message.

Considerations

- A user does not need a display telephone to use the Leave Message feature, but the message receiver must have a display telephone or the system must include a voice messaging system.

- Unlike Send/Remove Message, when the Leave Message feature is used to send a message to a person whose Message LED is on, the LED is not turned off even if the message sender is a system operator.

- If a system operator uses the Send/Remove Message feature while on a call, only an inside caller hears the touch-tones; an outside caller does not.

- A display telephone can store a maximum of 10 messages. If a user tries to send an eleventh message, the message sender hears a beep and display telephones show the "Message Box Full" message.

- Responding to messages by using Return Call does not delete the message. The user must delete all messages before the Message LED goes off.

- A maximum of four Message Waiting Receivers can be programmed for a fax.

- A fax machine can send the message waiting indication but a fax cannot be assigned as a Message Waiting Receiver for another fax or for a calling group and cannot receive message-waiting indications.

- If a fax message-waiting indication is deleted by one of the four message waiting receivers, the message is deleted from all analog multiline display telephones programmed as a message-waiting receivers for the fax, but the message is not deleted from MLX display telephones programmed as message-waiting receivers for the fax.

- Each calling group can have only one telephone assigned as its Message Waiting Receiver, but the same telephone can be assigned as the Message Waiting Receiver for more than one calling group.

- Messages can be posted only by using a programmed button or, for MLX display telephone users, by selecting the feature from the display. Single-line telephone users cannot post a message.

■ Posted messages are only seen by multiline display users. Users with single-line telephones or multiline telephones without a display cannot see a message posted by another user.

■ Posting a message does not prevent the telephone from ringing.

■ If a blank message is programmed via system programming, the user is not prevented from posting the blank message. However, callers with display telephones see nothing on the display to Indicate that a blank message is posted.

■ If, while posting a message, a user responds to a message by using Return Call, message posting is ended and the message is not posted.

■ The 5-button analog multiline telephone has neither a Message LED nor a Message button. To use Messaging, the user must program the feature onto a button.

Feature Interactions

Barge-In
If Barge-In is used to contact a user with a posted message, the caller's telephone does not display that message.

Directory
When an Extension Directory is used to call a co-worker with a posted message, the posted message is not displayed on the caller's telephone.

Direct-Line Console
The Send/Remove Message feature is a system operator-only feature used by the DLC system operator to turn on the Message LED to indicate a message waiting. For telephones without a display, Send/Remove Message is the only way the Message LED can be turned on and off by system operators.

A Send/Remove Message button is factory assigned to an MLX-28D used as a DLC. When a system has fewer than 29 lines connected, Send/Remove Message is factory assigned to analog DLCs with 34 buttons or more. The Send/Remove Message button is replaced with line 32 when the system has 32 lines or more. Send/Remove Message is not a fixed feature and can be assigned to any available button on either an analog or MLX DLC.

Direct Station Selector
When a system operator presses the Message Status button on a DSS adjunct, the LEDs on the DSS reflect only messages left by a system operator using the Send/Remove Message feature and not messages left by any user (including a system operator) using the Leave Message feature.

Display
When users try to send a message to a telephone whose message box is full, they see "Message Box Full" on the display. When a user tries to retrieve messages and the message box is empty, "No Messages" appears on the display indicating there are no messages.

When a user has a message from a co-worker, the display shows the name or extension number (if no alpha label is programmed) of the sender and, on MLX telephones, the time and date the message was left. On MLX telephones, an unread message is marked with an asterisk (*). On analog multiline telephones, an unread message is also marked with an asterisk (*), but no message information is shown.

Messages can also be received from outside callers (if the telephone has a voice messaging system) and from the system operator. Messages left by using a voice messaging system are identified as "V" on analog multiline telephones and "VMS" on MLX display telephones. Messages from the system operator are identified as "A" on analog multiline display telephones and "ATT Operator" on MLX display telephones.

Message-waiting indications received by a fax message-waiting receiver are identified as "F" on analog multiline display telephones and "Fax" on MLX display telephones. When the fax message waiting receiver has an analog multiline display telephone, the display shows "Call," the fax extension number and "F."

Notes:

■ Return Call is not operable for messages received from a fax machine and cannot be used to make a call to the fax.

■ The type of message indicated does not allow a calling group message-waiting receiver to distinguish between a message left for the calling group and a fax or personal message.

Users with display telephones who call an extension with a Posted Message see the message on their display.

Group Calling

Users can leave messages for the calling group only if the system has been programmed with a designated Calling Group Message Receiver. The receiver also receives fax message-waiting indications directed to the calling group. The message-waiting receiver cannot distinguish between messages left for the calling group and fax or personal messages.

Labeling

The labels stored in the Extension Directory appear on MLX display telephones when users send each other messages. Messages include the name (the 7 character label) of the user who sent the message and the time and day the user called.

Posted messages are created and changed using Labeling.

Multi-Function Module

A single-line telephone with a Message LED connected to an MFM can receive message-waiting indications.

Queued Call Console

A QCC system operator can use Leave Word Calling only by selecting the feature from the display. A Send/Remove Message button is programmed as a fixed feature on a QCC.

Signaling   If a display telephone user presses a Signaling button only to send an audible signal to a telephone with a posted message, the posted message at the destination is not shown on the display. However, if a display telephone user selects an Intercom or System Access button, lifts the handset, and uses the Signaling button to dial the extension, the posted message at the destination telephone is shown.

System Access   In the Hybrid/PBX mode, when a Shared System Access button is used to leave a message for a display user, the extension shown is that of the telephone with the Shared System Access button and not that of the principal station.

When a principal station user with an MLX display telephone posts a message and a call is answered at the Shared System Access button, the calling information is cleared from the principal station. However, the Home screen on which the posted message is shown is not restored. If the principal station user presses the Home button or makes or receives a call, the Home screen is restored.

Transfer   A non-display user who sends a message by using Leave Message while a transfer to another telephone is in progress cannot determine who received the message. For example, if station A calls station B and station B transfers the call to station C, and if station A sends a message before the transfer is complete, station B receives the message. If station A sends a message after station B completes the transfer, station C receives the message even if station C does not answer and the call is ringing at station B as a transfer return.

If an inside call is transferred to a telephone with a posted message, only the display telephone user who transfers the call sees the posted message and not the original caller even after the transfer is completed.

If a call is transferred to an extension programmed as a fax, the message indication is not sent to the fax message-waiting receiver regardless of the amount of time programmed for the fax message-waiting threshold.

System Programming

■ Change or add posted messages.

```
More -> Labeling -> PostMessage
```

■ Assign a fax Message Waiting Reciever.

```
AuxEquip -> Fax -> Msg Waiting
```

■ Assign a Message Waiting Reciever for calling group.

```
Extension -> Grp Calling -> Message
```

Microphone Disable

Description

Microphone Disable can be assigned via system programming to any MLX telephone, except a queued call console (QCC) to limit the use of the speakerphone. When the feature is assigned, the microphone does not function, but the speaker functions normally. A user can listen to calls or announcements over the speakerphone but must use the handset to respond.

For some features, such as Auto Dial, Last Number Dial, or Saved Number Dial, the system automatically selects a line and activates the speakerphone. When one of these features is used on a telephone with Microphone Disable assigned, the line is selected and the speaker is activated, but the microphone is muted automatically; the red LED next to the Mute button goes on. To be heard, the user lifts the handset and the Mute and Speaker LEDs go off.

Also, when group pages or voice-announced transfers are received on a telephone with Microphone Disable assigned, the user can hear the announcement over the speakerphone, but the microphone is muted automatically. The user must lift the handset to speak to an inside caller who is transferring a call or calling the user via a System Access Voice or Intercom Voice button.

Microphone Disable is appropriate when speakerphones may disrupt a quiet atmosphere, pick up too much background noise, or be provided only to certain employees.

Telephone Differences

Multiline Telephones   Microphone Disable cannot be assigned to analog multiline telephones.

Single-Line Telephones   Microphone Disable cannot be assigned to single-line telephones.

Considerations

- The LED next to the Mute button goes on whenever the speakerphone is activated. Pressing the Mute button does not turn off the LED or deactivate Microphone Disable.

- If a user presses the Speaker button before lifting the handset, the telephone selects a line and the user can dial a number. The microphone is muted and the user must lift the handset to speak to the person being called.

- Users whose microphones are disabled cannot use HFAI to respond to voice-announced calls. Pressing the HFAI button does not turn on the LED or activate the feature.

Feature Interactions

**Auto Dial,
Last Number Dial, and
Saved Number Dial**

When an MLX telephone user's microphone is disabled, pressing an Auto Dial, Last Number Dial, or Saved Number Dial button turns on the speakerphone so the user can hear the number being dialed. However, the user must lift the handset to talk once the call is answered.

Paging

Calls made to Speakerphone Paging Groups can still be heard over telephones whose microphones are disabled.

Queued Call Console

The microphone a QCC cannot be disabled.

Transfer

Calls can be transferred with a voice announcement to users whose microphones are disabled. but the users must lift the handset to talk.

Voice Announce to Busy

Users who are on their telephones and whose microphones are disabled can still hear the voice-announced call over the speakerphone. They must press the button the call came in on to talk to the caller.

System Programming

■ Enable or disable individual MLX telephone microphones. The factory setting is enabled.

```
Extensions -> More -> Mic Disable
```

Multi-Function Module

Description

The Multi-Function Module (MFM) is an optional adapter installed inside an MLX telephone and used for connecting tip/ring or external alert devices. The MFM operates on one of the two B channels assigned to the telephone; therefore, calls can be made to and from the device independently of the telephone.

The B channel is also used for the Voice Announce to Busy feature. Because of this, when a call is active at both the MLX telephone and the MFM device, the Voice Announce to Busy feature cannot be used to reach the MLX telephone user. Conversely, if the Voice Announce to Busy feature is being used to reach the MLX telephone user, calls cannot be made from the device connected to the MFM. In addition, if the Voice Announce to Busy feature is being used at the same time that a call is received at the MFM extension number, the caller hears ringing and the device rings if it is capable. But the call to the MFM extension number cannot be answered until one of the B channels is freed (the MLX telephone user hangs up or the person calling the MLX telephone user hangs up).

See "System Numbering" in this chapter for details on specific extension numbers assigned.

Although each digital station jack used to connect an MLX telephone is assigned only one logical ID, the system automatically assigns two extension numbers-one for the MLX telephone and one for the device connected to the MFM. Both extension numbers are assigned to the digital jack whether or not an MFM is connected. Since a separate extension number is assigned, features and line/trunk access can be assigned to the MFM independently of the MLX telephone.

The ringing patterns for devices connected to an MFM are similar to those of an MLX telephone rather than a single-line telephone-one ring for inside calls, two rings for outside calls, and three rings for priority ring or transfer return.

A switch on the MFM can be set for one of the following operations:

■ Tip/ring interface

■ Supplemental Alert Adapter (SAA)

Tip/Ring Interface

When the MFM is set for tip/ring interface operation, the following types of dual-tone, multi-frequency (DTMF) tip/ring devices can be used to make and/or receive inside and outside calls:

■ Single-line telephones

■ Modems

■ Fax machines

■ Transaction telephones

■ Cordless single-line telephones

■ Answering machines

■ Speakerphones that emulate a tip/ring device

Multi-Function Module **2-233**

Supplemental Alert Adapter

When the MFM is set for SAA operation, an external alert that requires a 48-VDC contact closure can be connected.

If the external alert is used to supplement the ringing for both inside and outside calls, the MFM should be assigned (via centralized telephone programming) as a primary Individual Coverage receiver with the ringing option of Immediate Ring. The MLX telephone can use Coverage On/Off to activate the alert. In addition, by specifying that both inside and outside calls or only outside calls are covered with the Coverage arrangement, the sender (in this case the MLX telephone user) can specify that the device (the receiver) rings for both inside and outside calls or only for outside calls.

If the external alert is used to supplement ringing only for calls received on personal lines (outside lines assigned to buttons), the same outside lines/trunks and ringing options assigned to the MLX telephone should also be assigned to the MFM. In this arrangement, the MFM device does not ring when inside calls are received on an Intercom or System Access button.

An external alert connected to an MFM set for SAA operation can also be used in a signaling arrangement (by using the Signaling feature) as a calling group Calls-in-Queue Alarm, or to provide supplemental ringing for after-hours calls received in a Night Service group.

Programming Requirements

Although the devices connected via an MFM do not have buttons, the system treats them as multiline telephones with 34 buttons. In the Hybrid/PBX mode, the system automatically assigns one System Ring, one System Access Voice, and one System Access Outgoing button to the MFM. In the Key mode, the system automatically assigns one Intercom Ring and one Intercom Voice button to the MFM. In the Behind Switch mode, the system automatically assigns one Intercom Ring, one Intercom Voice, and one Prime Line button.

To ensure proper operation of devices connected via an MFM, the following should be assigned via centralized telephone programming:

■ Voice Announce should be disabled.

■ The Intercom or System Access button assignments should be changed to one intercom or System Access Ring and one System Access or Intercom Originate Only button.

■ Ringing/Idle Line Preference should be enabled.

■ The Automatic Line Selection sequence should be set to the following:

　1. Intercom or System Access Ring

　2. Intercom or System Access Originate Only

　3. In Key and Behind Switch modes: outside lines that make calls from the MFM device. In the Behind Switch mode only: the Prime Line.

When the Automatic Line Selection sequence is set to select an Intercom or System Access button, an outside line can be selected by dialing the Idle Line Preference code (usually a 9--for Key and Behind Switch) or by dialing the pool dial-out or Automatic Route Selection code (Hybrid/PBX only). If Automatic Line Selection is set to select an outside line button before an Intercom or System Access button is selected, the device cannot be used to make inside calls (inside calls can be received only). Additionally, the following features cannot be used:

■ Personal Speed Dial

■ System Speed Dial

■ Account code entry

■ Pickup (individual and group)

■ Forward/Follow Me

■ Privacy

■ Reminder Service

■ Log in and out of calling group

Note. The features Forward and Follow Me (including Remote Call Forward) and Privacy are not recommended for use because the user does not have an LED that indicates when the feature is active.

■ Ringing options should be set to No Ring for each outside line on which calls will not be received.

■ When the device is used for supplementary answering (such as an answering machine) or ringing (such as an external alert) only for calls received on personal lines, and lines/trunks are assigned to or removed from the associated MLX telephone, the lines/trunks should also be assigned to or removed from the MFM.

■ When the device is used for both inside and outside calls to supplement ringing (external alert) or to answer or screen calls (answering machine), calls can be redirected to the device by assigning a Primary Cover, Secondary Cover, Group Cover, or Shared System Access button (Hybrid/PBX only). In addition, the MLX telephone user can activate the Forward/Follow Me features to redirect incoming calls to the device. However, Coverage and Foward/Follow Me should not be used simultaneously.

■ On any multiline telephone, an inside Auto Dial button can be programmed to determine whether devices such as fax machines or modems connected to the telephone via an MFM are in use.

Telephone Differences

Multiline Telephones

An MFM can be installed only in MLX telephones and cannot be used with analog multiline telephones.

Single-Line Telephones A single-line telephone or other type of tip/ring device can be connected to the MFM and used to make and receive inside and outside calls.

Mode Differences

Hybrid/PBX When the Ringing/Idle Line Preference is activated and Automatic Line Selection is set to select a System Access button, an outside line can be selected by dialing the pool dial-out or Automatic Route Selection code.

Key and Behind Switch When the Ringing/Idle Line Preference is activated and Automatic Line Selection is set to select an Intercom button, an outside line can be selected by dialing the Idle Line Preference code (usually a 9).

Considerations

- When both the MLX telephone and the device connected to an MFM are in use, the Voice Announce to Busy feature cannot be used to reach the MLX telephone user.

- The system cannot distinguish between tip/ring interface and SAA operation; the operation is selected by using pin straps in the MFM.

- When the MFM is in tip/ring interface operation, only DTMF devices can be used.

- When the Ringing/Idle Line Preference for an MFM device is activated and Automatic Line selection is set to an outside line/trunk, inside calls cannot be made and features cannot be used. Both inside and outside calls can be received.

- Calls are independently sent to the MLX telephone and its associated MFM. The following should be used when the user wants calls received at the MLX telephone to also be directed to the device connected on an MFM:

  - Cover buttons
  - Shared System Access buttons (Hybrid/PBX only)
  - Buttons assigned the same outside lines
  - Forward/Follow Me
  - Transfer

- When the connected device is used by the MLX telephone user to provide supplementary answering (such as an answering machine) or ringing (such as an external alert) only for calls received on personal lines, and lines/trunks are assigned to or removed from the associated MLX telephone, the lines/trunks should also be assigned to or removed from the MFM.

- An MFM cannot be assigned as a system operator position.

- An MFM can be assigned as a calling group delay announcement or as a calls-in-queue alert for a calling group queue.

■ Voice Announce should be disabled since the MFM does not support a speaker.

■ Tip/ring devices connected on a MFM should not be used with Call Management System (CMS).

■ Tip/ring applications that require a switchhook flash for operation (such as MERLIN® Attendant, or MERLIN MAIL Voice Messaging System) cannot be connected via an MFM since the system ignores the Switchhook flash sent by the device.

■ When a Shared System Access button or a shared personal line is assigned to the MFM, the device cannot detect when a line is picked up by the sharing user. Therefore, if an answering machine with the built-in ability to disconnect when another person picks up the same line is connected to the MFM, the machine does not automatically disconnect if the user picks up a call on the shared line that was already answered by the answering machine.

■ If the MFM is assigned as a primary Individual Coverage receiver, and the MLX telephone user uses Forward or Follow Me, and if an answering machine that disconnets when another person picks up the same line is connected to the MFM, the machine does not automatically disconnect if the forwarding destination picks up the call.

■ Single-line telephones connected to an MFM cannot use the Conference, Hold, or Transfer features.

Feature Interactions

Automatic Line Selection   The Automatic Line Selection order for the MFM should be set to select Intercom or System Access Ring, then Intercom or System Access Originate Only, and then outside lines assigned-to the MFM, or the Prime Line in the Behind Switch mode.

Callback   Both automatic and selective Callback can be used from an MFM; however, a callback call cannot be manually canceled.

Conference   The Conference feature cannot be used on the MFM since the system ignores the switchhook flash sent by the MFM.

Coverage   An MFM can be a sender or a receiver for Individual or Group Coverage. This allows the associated MLX telephone user to screen calls by using an answering machine connected to the MFM or to supplement ringing by using an external alert connected to the MFM. A sender can use Coverage On/Off to prevent calls from being sent to an answering machine.

Direct-Line Console   An MFM cannot be assigned as a DLC.

Do Not Disturb   Do Not Disturb is not recommended since the device connected to an MFM does not have an LED to indicate when the feature is active.

Forward and Follow Me   Forward and Follow Me (including Remote Calll Forward) are not recommended on an MFM because the user does not have an LED that indicates when the feature is active.

Group Calling   An MFM can be a member of a calling group, assigned as a delay announcement for a calling group, or used to connect the calls-in-queue alert for the calling group. An MFM used for the delay announcement or for the calls-in-queue alert should not be assigned as a group member.

Hold   Calls cannot be put on hold on an MFM since the system ignores the switchhook flash.

Messaging   A single-line telephone with Message LED connected to an MFM can receive message-waiting indications.

Night Service   An MFM can be a member of a Night Service group. An external alert connected to the MFM in the SAA operation, when assigned to a Night Service group, can be used for supplemental ringing for after-hours call.

Paging   An MFM should not be a member of a speakerphone paging group.

Park   An MFM user cannot park a call but can pickup a call parked by another user.

Personal Lines   When personal lines are assigned or removed from the associated MLX telephone, they should also be removed from the MFM when the device connected is used to answer calls or provide supplementary ringing.

                            As a general rule, personal lines should be removed from MFMs unless the device connected (such as a fax or a single-line telephone) requires a personal line on which to make an outside call.

Power Failure Transfer A single-line telephone connected to an MFM cannot be used for Power Failure Transfer.

Privacy

The use of Privacy is not recommended for MFMs because the user does not have an LED that indicates when the feature is active.

Queued Call Console

An MFM cannot be connected to a QCC and cannot be assigned as a QCC.

Ringing/Idle Line Preference

Ringing/Idle Line Preference should be enabled for an MFM.

Ringing Options

The ringing patterns for tip/ring devices connected to an MFM are those of an MLX telephone rather than a single-line telephone—one ring for inside calls, two rings for outside calls and three rings for priority ring or transfer return. Personalized ringing patterns cannot be programmed for an MFM. Centralized telephone programming must be used to program ringing options (Immediate Ring, Delayed Ring, or No Ring).

Saved Number Dial

Saved Number Dial cannot be used on an MFM.

Signaling

When set for SAA operation, an MFM can receive a manual signal but cannot send one. An MFM cannot receive a manual signal when set for tip/ring operation.

Station Message Detail Recording

An MFM is treated as an MLX telephone on SMDR reports. The system waits until the end of dialing before sending a connect message to the MFM and any digits dialed after the connect message is received are not recorded on SMDR reports.

System Access

It is recommended that one System Access or Intercom Ring button and one System Access or Intercom Originate Only button be assigned to the MFM. At least one System Access or Intercom button must be assigned to the MFM.

In the Hybrid/PBX mode, assigning a Shared System Access button for one or more of a principal station's System Access buttons creates a situation where the principal station can pick up calls that have already been answered by the answering machine. There is no way to inhibit coverage with this arrangement.

Transfer

Calls cannot be transferred on an MFM since the system ignores the switchhook flash.

Voice Announce to Busy

The Voice Announce to Busy feature is disabled when both the MLX telephone and the device connected to its associated MFM are in use. An MFM cannot make and answer calls when Voice Announce to Busy is being used to reach the MLX telephone user. The calls ring at the MFM but cannot be answered until the B channel is freed (either the MLX telephone user or the person calling the MLX telephone user hangs up).

Music-on-Hold

Description

Music-on-Hold provides music or recorded information to an outside caller during the following instances:

■ When on hold

■ While waiting in a calling group queue for an available calling group member

■ After using Remote Access, while waiting for a busy trunk pool (Hybrid/PBX only)

■ While waiting in the Callback queue for a busy extension

■ While camped-on to a busy extension

■ While on hold for a conference

■ While parked

■ While being transferred

The music source or recorded announcement device must be connected to a ground-start or loop-start line jack programmed for Music-on-Hold. Only one Music-on-Hold port is allowed per system.

Note: If you use equipment that rebroadcasts music or other copyrighted materials, you may be required to obtain a copyright license from or pay fees to a third party such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or you can purchase a Magic on Hold® system, which does not require you to obtain such a license, from AT&T or your authoried dealer.

Considerations

■ Music-on-Hold is not provided to inside callers.

■ A maximum of one Music-On-Hold port is allowed per system.

■ DID and tie-trunk jacks cannot be used for Music-on-Hold.

■ A line/trunk jack designated for Music-on-Hold cannot be grouped in a pool.

Feature Interactions

Callback   An outside caller waiting in the Callback queue hears Music-on-Hold.

Camp-on   When Camp-On is used to complete a transfer of an outside call to a busy extension, the caller hears ringback and not Music-on-Hold if Music-on-Hold is programmed as the transfer audible. If Camp-On is used to complete a transfer of an outside call to an extension that is not busy, the caller hears ringback instead of Music-on-Hold.

Conference	If the first participant put on hold for a conference call is an outside caller, the caller hears Music-on-Hold until the second participant is added.
Group Calling	An outside caller waiting in the calling group queue hears Music-on-Hold.
Park	A parked caller hears Music-on-Hold,
Personal Lines	A line/trunk used for Music-on-Hold cannot be assigned as a personal line.
Pools	In the Hybrid/PBX mode, trunk jacks used for Music-on-Hold cannot be assigned to trunk pods.
Remote Access	A Remote Access user who is waiting for a busy trunk pool or extension hears Music-on-Hold.
Transfer	An outside caller hears Music-on-Hold if the system is programmed for Transfer Audible.

System Programming

■ Designate the Music-on-Hold port.

```
AuxEquip -> MusicDnHold
```

Night Service

Extension Programming	**Programming Code:** *39 **Feature Code:** 39 **MLX Display Label:** Night Srvce [Night]

Description

Night Service provides options for after-hours telephone operation that can be programmed in any of these three combinations:

■ Night Service with Group-Assignment

■ Night Service with Outward Restriction

■ Night Service with Time Set

Night Service with Group Assignment

Each Night Service group established as Night Service with Group Assignment is associated with an individual queued call console (QCC) in the Hybrid/PBX mode or an individual direct-line console (DLC). Any type of telephone can be a member of a Night Service group.

When a QCC system operator associated with a Night Service group activates Night Service, any calls received on trunks programmed to ring at individual consoles ring immediately at all available telephones assigned to the group. When a DLC system operator associated with a Night Service group activates Night Service, any calls received on trunks assigned to buttons on the console ring immediately at all available telephones assigned to the group. A telephone is considered unavailable and a Night Service call does not ring at it when:

■ A telephone is in the extension or system programming mode.

■ A user with an MLX display telephone is using the Alarm Clock or Directory feature.

■ A telephone is busied-out for maintenance or system programming.

■ All Intercom or System Access buttons are in use.

■ A single-line telephone user is on a call.

■ Night Service is activated at a system operator console.

If a call is received on an outside line that is assigned to a Personal Line button on a group member telephone, the call rings immediately even if the Personal Line button is set for Delayed or No Ring. If the outside line is not assigned to the telephone, the call rings on an Intercom or System Access button.

Up to eight Night Service groups can be created, one for each system operator. There is no limit to the number of telephones assigned to each group, and each telephone can be assigned to more than one group.

**Night Service with
Outward Restriction**

Night Service with Outward Restriction prevents unauthorized after-hours use of telephones. When the option is programmed, only authorized system operators can activate and deactivate Night Service and only authorized users can place calls.

A system operator must enter a password to activate or deactivate Night Service. When one system operator activates or deactivates Night Service by using a password, all consoles are put into Night Service. If Night Service groups are assigned, Night Service is activated or deactivated for all groups and cannot be activated or deactivated independently for each group.

When the Night Service feature is activated, a user must enter a password before a non-emergency outside call is made. When the correct password is entered, the system then checks for calling restrictions assigned to each telephone before allowing calls to outside numbers.

A Night Service emergency numbers list can be created that includes up to 10 numbers, for example, police or fire departments, each with a maximum of 12 digits. Users who do not know the Night Service password can dial only the numbers on the list calls to numbers not on the list do not go through unless a password is entered first.

One exclusion list can be created to exempt specific telephones from the password requirement. An unlimited number of telephones can be assigned to the list. However, normal calling restrictions (if any) assigned to the telephone are still in effect. Unrestricted telephones on the exclusion list are not protected against unauthorized after-hours use.

**Night Service with
Time Set**

When the Night Service with Time Set option is programmed, the system automatically activates Night Service on all system operator consoles at a specified time of day and on specified days of the week. A different time of day to activate or deactivate Night Service can be programmed for each day of the week. System operators can still override the timer and turn Night Service on and off manually if they prefer. However, if one system operator overrides the timer, Night Service is activated or deactivated on all consoles.

Night Service can also be activated through system programming for special conditions, such as a midweek holiday.

Telephone Differences

Multiline Telephones

Only system operators can activate Night Service by using a direct-line console (DLC) or a queued call console (QCC). To activate or deactivate Night Service, the system operator presses the programmed Night Service button. If the Night Service with Outward Restriction option is programmed, when the system operator presses the programmed button, the green LED flashes and the system operator must enter the assigned password (within 60 seconds) to activate or deactivate Night Service. When Night Service is activated, the green LED next to the programmed button goes on. When the feature is deactivated, the green LED goes off.

QCC system operators can only use the programmed button. However, DLC system operators can also activate Night service by pressing the Feature button and dialing 39. When a feature code is used to activate or deactivate Night Service and Outward Restriction is programmed, the DLC system operator does not hear an error tone if an invalid password is entered and, unless a Night Service button is programmed, cannot determine whether Night Service is active.

To make a call when Night Service with Outward Restriction is assigned, the multiline telephone user presses the Hold button and dials the password before lifting the handset. When the correct password is entered, the user can lift the handset and make an outside call.

Single-Line Telephone   Single-line telephones cannot make outside calls when Night Service with Outward Restriction is activated.

Considerations

- A direct inward dialing (DID) call to any member of a Night Service group rings at all group members' telephones.

- If the telephone assigned to a Night Service group has the outside line assigned as a personal line (assigned to a button on the telephone), calls ring immediately at each telephone even if the Personal Line button on the telephone is set for Delayed Ring or No Ring. If the telephone does not have the outside line assigned, the call rings on an Intercom or System Access button.

- When Night Service is deactivated by the system operator or automatically by the system, telephones are reset to their programmed ringing options.

- When a feature code is used to activate or deactivate Night Service and Outward Restriction is programmed, the DLC system operator does not hear an error tone if an invalid password is entered and, unless a Night Service button is programmed, cannot determine whether Night Service is active.

- When both Night Service with Outward Restriction and Night Service with Time Set are programmed, the system imposes restrictions automatically.

- When Night Service with Outward Restriction and/or Night Service with Time Set is programmed, Night Service is activated or deactivated for all system operator consoles. If Night Service groups are also programmed, Night Service cannot be activated or deactivated for each group independently.

- When Night Service with Outward Restriction is activated, and a user with a restricted telephone presses a dial pad button while on a call, the call is disconnected, the user hears a fast busy signal, and the line/trunk is released. When the dialpad is used, the system assumes that the user is trying to make an outside call, which is not allowed because of the Night Service restriction assigned to the telephone.

- System operators can override Night Service with Time Set and turn Night Service on or off manually. However, Night Service is activated or deactivated for all consoles and for all Night Service Groups.

- Night Service with Time Set can be deactivated through system programming for special conditions such as a midweek holiday.

■ There can be up to eight Night Service groups, one for each system operator and there is no limit to the number of telephones assigned to each group. A telephone can be a member of more than one group.

■ An answering machine connected to a 012 module can be setup as a member of a Night Service group to automatically answer after-hours calls.

■ External alerts such as strobes, bells, or chimes can be connected to an analog multiline telephone by using a Supplemental Alert Adapter (SAA) or to an MLX telephone by using a Multi-Function Module (MFM) that is a member of a Night Service group. The external alert sounds or lights when a Night Service call comes into that telephone.

■ When Night Service with Outward Restriction is used, a system operator must enter a password to manually activate or deactivate Night Service.

Feature Interactions

Automatic Route Selection   When Night Service with Outward Restriction is programmed, the user must enter the password before dialing the ARS dial-out code unless the telephone is assigned to an Exclusion List or the number is on an Emergency Numbers List.

Calling Restrictions   For Night Service with Outward Restriction, a Night Service Emergency Numbers List must be created consisting of emergency numbers that can be dialed from any telephone without dialing the password. Any restrictions assigned to a telephone assigned to the exclusion list are in effect when Night Service is activated.

Direct-Line Console   On a system with 30 lines or fewer, a Night Service button is factory assigned to analog DLCs with 34 buttons or more. On a system with more than 30 lines, the Night Service button is replaced with line 31. A Night Service button is factory assigned to an MLX-28D used as a DLC, regardless of the number of lines/trunks connected to the system. The Night Service button is not a fixed feature and can be assigned to any available button on either an analog or MLX DLC.

Display   When a DLC system operator with an MLX telephone activates Night Service by using a programmed button, a message appears on the display. If the system operator must enter a password to turn Night Service on and off, the display prompts the operator for the password. No message is displayed when the system operator activates Night Service by using a feature code or when Night Service is off.

If an MLX display telephone is in the test mode, and a Night Service call arrives and the user exits the test mode while the call is still ringing, the call rings at the telephone. However, the calling information is not displayed. The user must press the Home button to see the call information.

Forward and Follow Me

When a station is a member of a Night Service group and Night Service is activated, calls received at the station are forwarded to extensions by using Forward and Follow Me but are not forwarded to outside telephone numbers when Remote Call Forward is used.

Multi-Function Module

An MFM can be a member of a Night Service group. An external alert connected to the MFM in the SAA operation, when assigned to a Night Service group, can be used for supplemental ringing for after-hours calls.

Pickup

A call ringing at a Night Service group telephone can be answered from another telephone by using Pickup.

Queued Call Console

A Night Service button is assigned as a fixed feature on a QCC.

If more than one QCC system operator is assigned to receive calls on an individual line/trunk, Night Service must be activated at all assigned positions before calls on the line/trunk ring on telephones programmed as members of the Night Service group. If Night Service is not activated by one of the QCCs programmed to receive the calls, after-hours calls ring at that position and do not receive Night Service coverage.

While a system is in Night Service, unassigned direct inward dialing (DID) extension and Listed Directory Number (the extension for the QCC queue) call types cannot be removed from ringing into the QCC queue. However, these call types can be removed from ringing into the QCC queue while Night Service is deactivated.

When multiple Night Service calls are received in the QCC queue at the same time and none of the calls are answered by a Night Service group member (all group member Intercom or System Access buttons are busy), new calls are sent to the QCC queue and can be answered only by the QCC system operator. To avoid this situation, all outside lines assigned to ring on the QCCs should be assigned as personal lines on at least one group member's telephone.

Remote Access

When Shared Remote Access is assigned to a line/trunk, incoming calls on that line/trunk receive the Remote Access treatment only when Night Service is activated on all system operator positions that receive calls on the line/trunk. When a call is received on a line/trunk assigned with Shared Remote Access and Night Service is not activated, the call rings at the assigned telephone, system operator console, or calling group.

Ringing Options

When Night Service is activated, normal ringing options are canceled and Night Service calls received at a Night Service member's telephone ring immediately even if the line buttons are programmed for Delayed Ring or No Ring. When Night Service is deactivated, telephones reset to their programmed ringing options.

System Access

In the Hybrid/PBX mode, Night Service calls override any ring options (Delayed Ring or No Ring) programmed for System Access buttons and ring immediately. On Shared System Access buttons, Night Service calls follow the programmed option (Immediate Ring, Delayed Ring, or No Ring).

System Programming

■ Assign or remove telephones from the Night Service group.

```
NightSrvce -> GroupAssign
```

■ Select the Night Service with Outward Restriction by assigning a password.

```
NightSrvce -> OutRestrict
```

■ Add or remove telephone numbers from the Night Service Emergency Allowed List.

```
NightSrvce -> Emergency
```

■ Assign or remove telephones trom the Exclusion List.

```
NightSrvce -> ExcludeList
```

■ Select the start time and stop time for each day of the week for Night Service with Time Set.

```
NightSrvce -> Stop -> Day of Week
```

Related Features

■ Call Coverage
■ Call Restrictions

Paging

Extension Programming

Speakerphone Paging:
Programming Code:
 Group Page Auto Dial Button: *22 + group
 or Page All extension number
MLX Display Label: **Group Page [GrpPg]**
 Loudspkr Pg [LdsPg]

Description

Paging allows a user to broadcast an announcement to individuals or to groups by using a telephone. The two ways to page are Speakerphone Paging and Loudspeaker Paging.

Speakerphone Paging

An announcement made by using Speakerphone Paging is heard on telephones with built-in speakerphones or speakerphone adjuncts. Speakerphone Paging can be directed to an individual telephone, to groups of telephones, or to all speakerphones throughout the system.

Individual Paging

The System Access Voice or Intercom Voice button on multiline telephones is used for Speakerphone Paging directed to an individual telephone (also called "voice-announced inside call"). The user selects the Voice button, and then dials the extension for the telephone to receive the voice-announced call. If the voice announcement can be made, the user hears a tone and then speaks into the handset.

Note: Queued call console (QCC) system operators cannot make or receive voice-announced inside calls.

The person called hears the announcement over the speakerphone unless one of the following conditions exist:

■ The telephone does not have a speakerphone or loudspeaker.

■ The person called is using the speakerphone.

■ The person called is on an analog multiline telephone, and Voice Announce To Busy is not assigned to the telphone.

■ The person called has an MLX telephone, and voice announcements.

■ The person called is using Do Not Disturb.

■ The person called is a QCC system operator.

When any of the conditions listed above exist, the user hears ringback if the person called has an available System Access or Intercom button, or hears the busy, call waiting, or Callback tone when the person called is busy on all System Access, Intercom, or QCC Call (Hybrid/PBX only) buttons. If the person called is using Do Not Disturb, the user hears a busy tone.

Speakerphone Paging to an individual telephone is considered an inside call. The green LED next to an available System Access or Intercom flashes to indicate an incoming call. The person called can use the HFAI (Hands Free Answer on Intercom) feature to talk to the caller or can pick up the handset and speak to the caller.

Group Paging

Group Paging is used to direct Speakerphone Paging to a selected group of telephones, such as a department or work area, or to all telephones in the system, except QCC system operator positions.

A maximum of seven speakerphone paging groups can be set up through system programming, and up to ten telephones can be assigned to the first six speakerphone paging groups. A telephone can being to more than one speakerphone paging group.

The system automatically reserves extension numbers 793-798 for the first six speakerphone paging groups. The seventh speakerphone paging group is called the "Page All" group and is factory-set to page all extension numbers. The system automatically reserves extension number 799 for the Page All group.

When the extension number for a speakerphone paging group is dialed by using the System Access or intercom button, the announcement is heard over the speakerphones on all telephones assigned to the group. If the extension dialed is for the Page All group, the announcement is heard on speakerphones throughout the system. A speakerphone paging group member does not hear a group page if one of the following conditions exists:

■ The paging group member is using the speakerphone.

■ The paging group member is on an analog multiline telephone, and Voice Announce To Busy is not assigned to the telephone.

■ The paging group member has an MLX telephone and has disabled voice-announcements.

■ The paging group member has an MLX telephone and is in the programming mode (extension, centralized, or system), or in the test mode.

■ The paging group member has an analog multiline telephone and is in the extension programming mode (speakerphone pages are received on an analog multiline telephone in the test mode).

■ The paging group member is using Do Not Disturb.

When a group member does not hear the announcement for any of the above reasons, the caller is not notified unless all telephones in the group cannot hear the page, in which case, the caller hears the busy signal.

A call to a speakerphone paging group is not considered an inside call. The people being paged can only listen to the page over the speakerphone and cannot respond to the person making the page.

Loudspeaker Paging

Loudspeaker Paging is used when a loudspeaker paging system is connected to the system on a line jack programmed as a loudspeaker paging port. A maximum of three line jacks can be programmed as loudspeaker paging ports. Pages over a loudspeaker paging system are heard everywhere in the building or just in a particular area, depending on whether or not the loudspeaker system is a multi-zone paging system.

Telephone Differences

Queued Call Console

A QCC cannot make and receive voice-announced inside calls (speaker-phone calls to an individual extension). A QCC cannot be a member of a speakerphone paging group. The QCC system operator can use the Group Page feature by selecting a Call button and pressing the DSS button or dialing the extension for the group.

A QCC system operator can use a loudspeaker paging system only by selecting a Call button, selecting Loudspeaker Paging from the display, and then dialing the loudspeaker paging port's line number (801-880).

All Other Multiline Telephones

To direct Speakerphone Paging to an individual telephone, the multiline telephone user selects a System Access Voice or Intercom Voice button, dials the extension number, and speaks into the handset or speakerphone. To direct Speakerphone Paging to a group of telephones or to all telephones by using Page All, the multiline telephone user selects any System Access or Intercom button, presses the programmed Group Page button or dials the extension for the speakerphone paging group or Page All group, and speaks into the handset. (Using a speakerphone for a group page can cause feedback.)

A multiline telephone user can access the loudspeaker paging equipment and make an announcement via Loudspeaker Paging by selecting:

■ A line button programmed for the line jack on which the loudspeaker paging system is connected.

■ A System Access button and dialing the pool dial-out code for the loudspeaker paging port (Hybrid/PBX only).

■ An Intercom or System Access button (either by pressing a Pickup button programmed specifically for the paging port or pressing the Feature button), and then dialing the Pickup feature code (9), and then the paging port's line number (801-880).

■ Loudspeaker Page from the display (MLX display telephones only) and dialing the line number (801-880).

Once the loudspeaker paging system is accessed, the user dials the assigned code number for the paging area, if required by the loudspeaker paging system, and speaks into the handset.

Single-Line Telephones

Single-line telephones cannot be used to make voice-announced inside calls (Speakerphone Paging directed to an individual telephone). To direct Speakerphone Paging to a group of telephones or to all telephones by using Page All, the single-line telephone user lifts the handset (while listening to internal dial tone), dials the extension for the paging group or Page All group, and speaks into the handset.

To use Loudspeaker Paging, the single-line telephone user lifts the handset (while listening to internal dial tone), dials #9 (Pickup) and then the paging port's line number, and speaks into the handset. The paging port is normally not assigned to a single-line telephone.

Considerations

■ A QCC system operator cannot make or receive voice-announced inside calls (speakerphone paging calls to an individual telephone).

■ A maximum of seven speakerphone paging groups are allowed; a maximum of ten telephones are allowed in the first six groups, and the seventh group contains all telephones and is used for Page All.

■ When the system includes the large processor module and the Page All extension is dialed (factory-set at 799), a delay occurs after the first digit is dialed. This is normal operation and the call goes through.

■ A QCC cannot be a member of a speakerphone paging group and cannot receive group pages. However, it can make announcements to a paging group.

■ A telephone can be assigned to more than one speakerphone paging group.

■ A telephone without a speakerphone, loudspeaker, or speakerphone adjunct cannot be a member of a speakerphone paging group.

■ When a user tries to direct an announcement to a speakerphone paging group that is receiving a page, the user hears a busy signal.

■ When a group member does not hear the announcement, the caller is not notified unless all telephones in the group cannot hear the page, in which case, the caller hears the busy signal.

■ If an analog multiline telephone user does not have Voice Announce to Busy and the user lifts the handset while listening to a speakerphone page, the user is disconnected from the page.

■ If a user on an analog multiline telephone with Voice Announce to Busy or a user on an MLX telephone lifts the handset while listening to a page, the page continues and the user can still make a call.

■ A maximum of three line jacks can be programmed as loudspeaker paging ports and used to connect a single-zone or multi-zone paging system. Each of these requires its own loudspeaker paging jack, and users cannot use more than one paging system at a time by dialing a single access code.

■ If a loudspeaker paging jack is not programmed, Loudspeaker Page is not shown as a feature choice on MLX display telephones.

■ Using the speakerphone for Speakerphone or Loudspeaker Paging may create a feedback tone.

■ Any loop-start (LS) or ground start/loop start (GS/LS) line jack can be assigned as a loudspeaker paging port. A line/trunk jack on an 800 DID, 100D, or 400EM (tie-trunk) module cannot be programmed as a loudspeaker paging port.

■ Station jacks cannot be programmed as a loudspeaker paging port.

■ The loudspeaker paging port cannot be assigned to a pool that contains trunks used to make or receive outgoing calls.

■ When a line/trunk jack is assigned as a loudspeaker paging port, only the loudspeaker paging system can be connected.

■ If the loudspeaker paging system is multi-zone, users must dial the appropriate zone number specified by the paging system before making an announcement.

■ The system supports loudspeaker systems with "talkback" (bi-directional paging), which allows users to respond to pages.

■ Loudspeaker pages cannot be made with MLC-5 cordless telephones.

Feature Interactions

Auto Dial A speakerphone paging group extension number can be programmed onto an inside Auto Dial button.

Barge-In Barge-In cannot be used to join speakerphone or loudspeaker paging calls.

Callback A speakerphone paging (voice-announced inside) call that is queued by using Callback automatically becomes a ringing call. Callback cannot be used for calls to a speakerphone paging group. Systems with loudspeaker paging can be setup to allow calls to be queued for the loudspeaker paging system by placing the Loudspeaker paging port in its own pool and having users access the paging system via the pool. When the pool is busy, the call to the loudspeaker paging system can be queued.

Call Waiting Call Waiting cannot be used for Group Speakerphone Page calls to busy extensions.

Camp-On Camp-On cannot be used for calls to busy speakerphone paging groups.

Conference Speakerphone and loudspeaker paging calls cannot be added to a conference.

Direct-Line Console

The line/trunk jack programmed as a loudspeaker paging port can be assigned to a button on an analog or digital DLC for one-touch access. A system operator with a digital DLC can also access a loudspeaker paging system by dialing the line/trunk number (801-880) for the line/trunk jack on which the loudspeaker paging system is connected.

Direct Station Selector

A DSS button for a line/trunk programmed as a loudspeaker paging port is used only to indicate whether the paging system is in use and cannot be used to gain access to the loudspeaker paging system. A DSS button can be used only to dial an extension for a paging group.

When a DSS button for a paging group is pressed, the transfer process is not automatically initiated even if One-Touch Transfer (DLC only) or automatic Extended Call Completion (QCC only) is programmed for the system.

Display

When users with MLX display telephones use Group Page, they see a message on the display indicating the number of the paging group.

Do Not Disturb

Speakerphone paging calls cannot be made to a telephone with the Do Not Disturb feature activated.

Forward and Follow Me

Calls cannot be forwarded to a paging group. The line/trunk number used to connect loudspeaker paging equipment cannot be used to forward calls to outside telephone numbers.

Headset Options

A user with a headset hears Group Speakerphone Paging over the speaker phone.

Hold

A speakerphone paging call can be put on hold by the caller or, when used to make an inside voice-announced call, by the person being called.

Inspect

If the user gets a voice-announced inside call or a Group Speakerphone Page while using the Inspect feature, the Inspect feature is canceled and the user is returned to the Home screen.

Microphone Disable

Calls made to Speakerphone Paging Groups can still be heard over telephones whose microphones are disabled.

Multi-Function Module

An MFM should not be a member of a speakerphone paging group.

Personal Line

A line/trunk used for loudspeaker paging equipment cannot be assigned as a personal line.

Pickup When the line number used for loudspeaker paging is not assigned to a button on a multiline telephone, a user can access the loudspeaker paging system by using Individual Pickup and dialing the paging port's line number (801-880) or by programming a Pickup button specifically for the paging port line number.

Pools In the Hybrid/PBX mode, trunk jacks used for loudspeaker paging cannot be assigned to trunk pools.

Queued Call Console A QCC cannot make and receive voice-announced inside calls (speakerphone calls to an individual extension). A QCC cannot be a member of a speakerphone paging group. A QCC system operator can use a loudspeaker paging system-only by selecting the feature from the display and can use Group Page by selecting a Call button and pressing the DSS button or dialing the extension for the group.

Remote Access Loudspeaker paging cannot be accessed from outside the system via either direct inward dialing (DID) lines or Remote Access.

Station Message Detail Recording Paging calls are not reported to SMDR.

System Access Announcements using Speakerphone Paging can be made from a Shared System Access button when a system operates in the Hybrid/PBX mode. However, users cannot join a page, as they can other calls, on Shared System Access buttons.

System Numbering Extensions for paging groups (the factory-set extensions are 793-799) can be renumbered.

Transfer Calls cannot be transferred to paging groups or to the loudspeaker paging extension.

Voice Announce to Busy Users who program their telephones to prevent voice announcements do not receive group speakerphone pages.

System Programming

■ Assign telephones to paging groups.

```
Extensions -> More -> Group Page
```

■ Designate a loop-start (LS) or ground-start/loop-start (GS/LS) line jack as a paging port (maximum of three).

```
AuxEquip  ->  Ldspkr  Pg
```

Park

Extension Programming

Programming Code:
  Park at own extension: *86
  Park Zone Auto Dial: *22 + park zone
                                      (DLC) system operators only)
MLX Display Label:
  Park at own extension: `Park`
  Park Zone Auto Dial: `Park Zone [PrkZn]`

Description

Park allows a user to put a call on a special type of hold so that it can be picked up from any telephone in the system. A user can park a call and then pick it up at another telephone, or can use Paging to announce the call so that another person can pick it up. A parked call is picked up by using the Pickup feature.

A user (excluding a queued call console system operator) can park a call by activating Park during the call or by pressing the Transfer button, dialing his or her own extension number, and pressing the Transfer button again or hanging up to complete the transfer.

The system also automatically reserves eight extensions (881-888) for system operator park zones. Only system operators can use these park zone extensions to park calls. Direct-line console (DLC) system operators can park calls by activating Park during the call, dialing the extension for park zones, and pressing the Transfer button or hanging up to complete the transfer to the park zone. A DLC system operator or a queued call console (QCC) system operator with a Direct Station Selector (DSS) parks a call by pressing the DSS button for the system operator park zone. This is the only way a QCC system operator can park calls; a QCC system operator without a DSS cannot park calls.

If the parked call is not picked up within the Call Park Return Interval (30-300 seconds; the factory setting is 180 seconds), the call returns to the telephone that was used to park the call. For QCC system operators (Hybrid/PBX only), returning parked calls can also be programmed to return to a different system operator.

Telephone Differences

Queued Call Console

A QCC system operator with a DSS parks a call by pressing the DSS button for the park zone or by pressing the Start button and then the DSS button. The call is automatically parked (the system operator does not need to press the Release button). A QCC system operator without a DSS cannot park calls.

To pickup a parked call, the QCC system operator presses the Feature button, selects Park from the display, and dials the extension number for the telephone or park zone where the call is parked.

All Other Multiline Telephones

A multiline telephone user parks a call on their own extension number by pressing a programmed Park button. MLX display telephone users can also press the Feature button and select Park from the display. A DLC system operator parks a call by pressing a button programmed for a specific park zone.

If a user or system operator pages another person, the extension number for the telephone or park zone should be provided as part of the call announcement.

A multiline telephone user can also park calls by pressing the Transfer button, dialing his or her own extension number (the user hears a busy tone), and then pressing the Transfer button again or hanging up to complete the transfer. The call is automatically parked when the transfer is completed. A DLC system operator can use this method to transfer calls to the park zone extensions. DSS or Auto Dial buttons can also be used to transfer a call to a park zone.

To pickup a parked call, the multiline telephone user presses a programmed Pickup button or presses the Feature button and dials the Pickup feature code (9), and then dials the extension number for the telephone or park zone where the call is parked. MLX telephone users can also press the Feature button and select the feature from the display.

Single-Line Telephones

To park a call, the single-line telephone user presses and releases the Recall button or switchhook and dials his or her own extension. The call is automatically parked, and the user can hang up. Single-line telephone users cannot use park zones to park calls.

Note: If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to park a call.

To pickup a parked call, the single line user lifts the handset (while listening to internal dial tone), dials #9, and then dials the extension number for the telephone or park zone where the call is parked.

Considerations

See "Paging" in this chapter for more on Loudspeaker and Speakerphone Paging.

■ Users (excluding QCC system operators) can park calls only at their own extensions. Only system operators can use park zones to park calls.

■ The system automatically reserves eight extensions (881-888) for system operator park zones. Only system operators can use these park zone extensions to park calls.

■ Two intercom or System Access buttons are required when users park calls by using their own extensions. If a user (such as a DLC system operator) must park more than one call, more Intercom or System Access buttons should be assigned to the telephone.

■ An individual system operator can park a maximum of eight calls. However, only eight park zones are available per system and are shared by all system operators.

■ Users can also park calls by transferring the call to their own extension (or for system operators, to the park zone) and, either pressing the Transfer button again or hanging up to complete the transfer.

■ Only queued call console (QCC) system operators with DSSs can park calls. A QCC system operator without a DSS cannot park calls, and QCC system operators cannot park calls on their own extensions.

■ To park a call at a park zone, the system operator with a DSS presses the DSS button for the park zone while the caller is on the line. If a system operator tries to park a call by pressing the Transfer button followed by the DSS button for the park zone, the call is put on hold for transfer and is not parked. This may result in transferring a call to an outside number in error.

■ The programmed Park Interval (30-300 seconds in increments of 10 seconds) determines the number of seconds or minutes that a call remains parked before it returns to the person who parked it. The factory setting is 180 seconds.

■ If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to park a call.

■ For QCC system operators only, returning parked calls can also be programmed to return to a different system operator.

Feature Interactions

Auto Dial

A system operator can program the park zone codes on inside Auto Dial buttons. An inside Auto Dial button can also be programmed with a user's (including a system operator's) own extension number and can be used to park calls. When the system is programmed for One-Touch Hold with manual completion, the user hears a busy signal and must complete the transfer by hanging up or by pressing the Transfer button.

Callback

Calls waiting in a Callback queue cannot be parked.

Conference

Conference calls can be parked by all users except a QCC system operator; however, they remain parked and do not return to the originating telephone if the Call Park Interval is exceeded. If a QCC system operator tries to park a conference call by pressing the Start button and then pressing the DSS button for the park zone, the park is denied and the system operator is reconnected to the conference call.

Coverage	A returning parked call is not eligible for Coverage. A call answered on a Primary Cover, Secondary Cover, or Group Cover button can be parked on that button.
Direct-Line Console	Eight park zone codes are automatically reserved for parking calls from a DLC. The factory-set extension numbers are 881-888. These numbers cannot be assigned to the DSS buttons on a MERLIN II System Display Console. For the park zones to be assigned to a DSS connected to a digital DLC, the extension numbers must be in the range programmed for the Page buttons.
	A system operator can program the Park zone codes on inside Auto Dial buttons. An inside Auto Dial button can also be programmed with a user's (including a system operator's) own extension number and can be used to park calls. When the system is programmed for One-Touch Hold with manual completion, a user hears a busy signal when parking a call at his or her own extension number and must complete the transfer by hanging up or by pressing the Transfer button.
Direct Station Selector	Park zone codes cannot be assigned to the DSS buttons on a MERLIN II System Dislay Console. For the park zones to be assigned to a DSS connected to an MLX system operator console, the extension numbers must be in the range programmed for the Page buttons.
	When a system operator parks a call by using an associated DSS button and the call returns, the red LED associated with the park zone where the call was parked goes off and does not flash as it does for a transfer return.
	To park a call at a park zone, the system operator with a DSS presses the DSS button for the park zone while the caller is on the line. If a system operator tries to park a call by pressing the Transfer button followed by the DSS button for the Park zone, the call is put on hold for transfer and is not parked. This may result in transferring a call to an outside number in error.
Display	On queued call console (QCC), returning parked calls are identified by call type and the name or extension number of the system operator who parked the call. The second line of the QCC display also shows the caller information.
Forward and Follow Me	Returning parked calls are not forwarded.
Group Calling	A calling group member who parks a call is considered available to receive another call.
Headset Options	If a call is parked, another call can be automatically answered by using Headset Auto Answer.

Hold	If a single-line telephone user with a call on hold hangs up, the call is disconnected. Park should be used instead of Hold. When a user or system operator parks a call received on a Personal Line button and it is picked up at another telephone and put on hold by using the Hold button, other users who share the personal line cannot press the line button and pick up the call.
Line Request	Returning parked calls cancels Line Request.
Multi-Function Module	An MFM user cannot park a call but can pickup a call parked by another user.
Music-on-Hold	A parked caller hears Music-on-Hold.
Pickup	A parked call can be picked up by using Individual Pickup.
Queued Call Console	Eight park zone dial codes are automatically reserved for parking calls from a QCC. The factory-set extension numbers are 881-888. For the park zones to be assigned to a DSS connected to a QCC position, the extension numbers must be in the range programmed for the Page buttons.
	Only a QCC system operator with a DSS can park calls on DSS buttons that correspond to the system operator park zones. A QCC system operator without a DSS cannot park calls, and a QCC system operator cannot park a call by using the console's extension number.
	Calls parked by QCC system operators can be programmed to return to the QCC queue or can be assigned to the QCC system operator who parked the calls and/or to another QCC system operator. Returning parked calls are assigned a QCC priority level (the factory setting is 4) by using Message Center Operation. A QCC system operator can return a parked call to the Message Center position.
Recall	A single-line telephone user can use Park if the telephone has a Recall button.
Station Message Detail Recording	If an incoming call is parked but not picked up by the other extension, the extension of the user who activated Park is shown in the "Station Extension" field of the SMDR record for the call. If an incoming call is parked and picked up by the destination extension, the destination extension is shown in the "Station Extension" field of the SMDR report.
System Access	When a user parks a call made or received on a System Access button, Shared System Access buttons do not ring when the parked call returns.
System Numbering	System operator park zones (the factory-set zones are 881-888) can be renumbered.

Transfer

A user can also park calls by pressing the Transfer button and dialing his or her own extension. DLC system operators can press Transfer and dial a system operator park zone. When this method is used, the transfer must be completed by pressing the Transfer button or by hanging up. This method cannot be used by QCC system operators.

System Programming

■ Assign Park Interval (30-300 seconds in 10-second increments). The factory setting is 180 seconds.

```
Options -> CallParkRtn
```

Related Features

■ Hold

■ Transfer

Personal Lines

Description

A personal line (also called direct facility termination) is an outside line/trunk that is assigned to a button on one or more telephones. A personal line can provide a user exclusive use of a specific line/trunk, or the line can be shared by a maximum of 64 telephones. In the Hybrid/PBX mode, a personal line allows users to receive outside calls without system operator involvement.

When a personal line is assigned to more than one telephone, the principal user of the personal line can be assigned via system programming. Assigning the telephone as the principal user has the following effects:

■ A principal user with Remote Call Forward can forward calls received on the personal line to an outside telephone number.

Note: Using Remote Call Forward to forward calls to outside numbers does not work on loop-start lines/trunks with unreliable disconnect.

■ Calls received on the personal line follow the principal user's Individual or Group Coverage patterns unless the personal line is set to no ring.

A personal line can be selected to make or receive outside calls by pressing the associated Personal Line button on a multiline telephone; dial-out codes are not needed. When the line is in use, the green LED is on at all multiline telephones that share the personal line. Inside calls cannot be made or received on a personal line.

When an individual personal line is assigned to a Personal Line button on more than one telephone, each user can join an in-progress call on which Privacy has not been activated by selecting the Personal Line button with the call. A maximum of two users can join an in-progress call (including conference calls) for a maximum of three users on the same call.

In the Key mode, the factory setting for personal line assignment is that the first 1--8 lines connected to the system are assigned as personal lines on all multiline telephones, including Multi-Function Modules (MFMs) connected to MLX telephones. No personal lines are assigned to single-line telephones or tip/ring devices connected to a 012 or 008 OPT module. For the Behind Switch and Hybrid/PBX modes the factory setting assigns no personal lines to multiline telephones, single-line telephones, or tip/ring devices connected to a 012 or 008 OPT module.

The factory setting for all modes of analog direct-line consoles (DLCs) assigns the first 1-32 lines connected to the system as personal lines. For digital DLCs, the factory setting assigns the first 1-18 lines connected to the system as personal lines.

See "Automatic Line Selection" and "Ringing/Idle Line Reference" in this chapter for details on these features.

Personal lines can be assigned via system programming to single-line telephones or any other type of tip/ring device to allow the user to receive outside calls. Normally the Ringing/Idle Line Preference for single-line telephones or other tip/ring devices IS activated and the Automatic Line Selection is set to select an Intercom or System Access button. With this arrangement in the Key and Behind Switch modes, the single-line telephone user can select the personal line to make an outside call by dialing the Idle Line Preference code (usually 9) while listening to the inside dial tone.

In the Hybrid/PBX mode, when Ringing/Idle Line Preference is deactivated or the Automatic Line Selection is set to select an Intercom or System Access button, the single-line user cannot select the personal line to make calls but can receive calls on the personal line.

For single-line telephones or other tip/ring devices in any mode, the Automatic Line Selection can be set to select the personal line. However, the user cannot make inside calls or activate system features with this arrangement.

A multiline telephone user can program Personal Line buttons for Immediate Ring, Delayed Ring, or No Ring. When a Personal Line button is programmed for No Ring, the user can still answer calls received on a personal line by pressing the Personal Line button with the flashing green LED. However, when a Personal Line is set to No Ring and individual and/or Group Coverage is programmed for the user, calls received on the personal line are not sent to Coverage.

Telephone Differences

Multiline Telephones

Personal lines cannot be assigned to queued call consoles (QCCs).

A personal line is selected by pressing the associated Personal Line button. Dial-out codes are not required for making outside calls.

Single-Line Telephones

A single-line telephone user can receive calls on personal lines. To allow a single-line telephone user to select a personal line to make a call, the Ringing/Idle Line Preference must be activated and the Automatic Line Selection must be set to select an Intercom or System Access button. With this arrangement, in the Key and Behind Switch modes, the single-line telephone user can select the personal line to make an outside call by dialing the Idle Line Preference code (usually a 9) while listening to the inside dial tone.

Mode Differences

Hybrid/PBX

In the Hybrid/PBX mode, when Ringing/Idle Line Preference is enabled and Automatic Line Selection is set to select a System Access button, the single-line telephone user cannot select the personal line to make calls. However, outside calls can be received on the personal line.

Key and Behind Switch   In the Key and Behind Switch modes, when Ringing/Idle Line Preference is enabled and Automatic Line Selection is set for an Intercom button, the single-line user can select the personal line to make an outside call by dialing the Idle Line Preference code (usually 9) while listening to the inside dial tone.

Considerations

■   A maximum of 64 stations can share a personal line.

■   If a non-DID line/trunk is not assigned as a personal line, nor grouped in a pool (Hybrid/PBX only), nor assigned to ring into the QCC queue (Hybrid/PBX only), and a call is received on the line/trunk, the caller hears ringback even if that line/trunk does not terminate anywhere in the system.

■   If a DID trunk is assigned as a personal line, and a call received on the DID trunk is ringing at the station programmed to receive the calls (the routing station), the call can be answered by using the Personal Line button. However, this is not recommended since the purpose of DID trunks is to route calls to specific stations without the need for personal line assignment or system operator assistance.

■   A station can be programmed as the principal user (owner) of a personal line. When this is programmed, the extension can forward calls to an outside number by using Remote Call Forwarding. When the owner has Individual or Group Coverage, calls received on the personal line follow the owner's coverage and not the coverage of telephones that also share the personal line.

■   When no principal user is assigned for a personal line, calls received on the personal line are not forwarded to outside telephone numbers but do follow the Coverage patterns for all users who share the line.

■   Two users can join an in-progress call (including conference calls) for a maximum of three users on the same call.

■   Outside lines/trunks used as personal lines cannot be assigned to a pool and cannot be assigned as Loudspeaker Paging, Music-on-Hold, or Maintenance Alarm ports.

■   DID trunks (Hybrid/PBX only) cannot be used as personal lines.

■   Personal lines cannot be assigned to a QCC(Hybrid/PBX only).

Feature Interactions

Alarm   A line/trunk jack used for a Maintenance Alarm cannot be assigned as a personal line.

Allowed Lists and Calling Restrictions	A user with an outward-restricted telephone cannot dial an outside number on a Personal Line button unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number on a Personal Line button unless the number is on an Allowed List assigned to the telephone.
Auto Dial	Only an outside Auto Dial button can be used on a personal line.
Automatic Route Selection	ARS cannot be used on personal lines.
Callback	The Callback feature cannot be used to request a busy personal line.
Call Waiting	A user does not hear a Call Waiting tone for calls received on a personal line unless the business subscribes to the Call Waiting service from the local telephone company.
Coverage	Assigning a sender as the principal user of a personal line specifies that the calls received on the personal line are sent to the principal user's Individual and Group receivers. A principal user with Remote Call Forwarding can forward calls received on the personal line to an outside number.
	Calls received on Personal Line buttons programmed for No Ring or on senders' telephones other than the principal user are not eligible for Coverage.
	Only one extension can be assigned as the principal user for each individual line/trunk. If no principal user is assigned and the personal line is shared by other senders, calls received on the personal line are sent to all available Individual Coverage receivers for all senders sharing the line and to the Group Coverage receivers programmed for the sender with the lowest logical ID.
	Once a receiver answers a call received on a personal line on a Cover button and puts the call on hold, the sender and any other user who shares the personal line cannot pickup the call by pressing the Personal Line button. For proper handling, the receiver should transfer the call to the sender.
Direct-Line Console	The factory setting for all modes of analog DLCs assigns the first 1-32 lines connected to the system as personal lines. For digital DLCs, the first 1-18 lines connected to the system are automatically assigned as personal lines.
Directory	A System or Personal Directory (MLX-20L only) can be used to dial numbers on a personal line. An Extension Directory is used only for inside calls and cannot be used to dial calls on a personal line.
Disallowed Lists	A user cannot select a personal line and dial an outside number when the number is on a Disallowed List assigned to the telephone.

Forced Account Code Entry

When Forced Account Entry is assigned to a telephone and the user tries to dial an outside call on a Personal Line button without entering the account code, the telephone loses its dial tone.

Forward and Follow Me

When an extension is programmed as the principal user of a personal line, calls received on the personal line are forwarded to an outside number (if the station can use Remote Call Forward), unless the outside line/trunk is a loop-start line/trunk with an unreliable disconnect.

While the system is dialing the outside telephone number to forward a call, the Privacy feature is automatically activated and users who share the personal line cannot join the call.

Group Calling

To allow all calling group members' telephones to ring when an outside call is not answered within three rings, the lines/trunks programmed to ring into the queue can also be assigned to buttons on group member telephones and programmed for Delayed Ring. This does not work for inside calls, Remote Access Calls, direct inward dialing calls, or if a delay announcement device is assigned to the group.

If a person uses a shared Personal Line button to join a call in the calling group queue, the call is removed from the queue. If a delay announcement is playing, it is disconnected from the call.

Hold

If a call is received on a personal line and is transferred to another user who receives the call on a System Access or Intercom button and puts the call on hold, users who share the line cannot select the Personal Line button and pick up the call. If the person who received the transfer and put the call on hold cannot return to the call, another user must use the Line Pickup feature to pick up the call (for example, a system operator can take a message and disconnect the caller).

Multi-Function Module

When personal lines are assigned or removed from the associated MLX telephone, they should also be removed from the MFM when the device connected is used to answer calls or provide supplementary ringing.

As a general rule, personal lines should be removed from MFMs unless the device connected (such as a fax or a single-line telephone) requires a personal line on which to make an outside call.

Music-on-Hold

A line/trunk used for Music-on-Hold cannot be assigned as a personal line.

Paging

A line/trunk used for loudspeaker paging equipment cannot be assigned as personal line.

Privacy   When an individual personal line is assigned to more than one telephone, a user with the personal line cannot join an in-progress call on which Privacy has been activated.

Pools   A personal line cannot be assigned to a pool.

Queued Call Console   Personal lines cannot be assigned to a QCC.

System Access   When a call on a Personal Line button is transferred to another user, the call rings on an Intercom or System Access button. The LED next to the personal line flashes (fast) to indicate that the call is on hold for transfer. If the call is answered at an Intercom or System Access button, the LED next to the personal line goes on steady. If the user shares the personal line appearance and answers the call by using the Personal Line button, the call is removed from the Intercom or System Access button.

System Programming

■ Assign or remove personal lines to or from stations.

```
Extensions -> LinesTrunks
```

■ Assign or remove principal user of a personal line-specifies that an individual extension can forward calls received on a specific personal line to an outside telephone number; calls received on the personal line follow only the individual extension's Coverage patterns and not the Coverage patterns of other users who share the line.

```
LinesTrunks -> More -> PrncipalUsr
```

Pickup

Extension Programming

Programming Codes:
  Individual Pickup:
     General use: ***9**
      Specific extension: ***9 + extension number**
      Specific line: ***9 + line number**
  Group Pickup: ***88**

Feature Codes:
  individual Pickup:
     Specific extension: **9 + extension number**
     Specific Line: **9 + line number**
  Group Pickup: **88**

MLX Display Label:
  Individual Pickup:
     General use: **Pickup, General [pkup,Gnrl]**
      Specific extension: **Pickup, Extension [Pkup, Ext]**
       Specific Line: **Pickup, Line[Pkup, Line]**
  Group Pickup: **Pickup, Group [pkup, Group]**

Description

Pickup allows users to answer a call that is ringing, parked, or on hold anywhere in the system. Two types of Pickup are available:

■ Individual Pickup

■ Group Pickup

Individual Pickup

Individual Pickup allows a user to "pick up" parked calls, or calls that are ringing or on hold at another telephone. individual Pickup can be used in the following ways:

■ **Extension Pickup.** The user can pick up a call that is ringing or on hold at another telephone by activating the Pickup feature then dialing the telephone's extension number. If the target telephone has more than one call ringing, the first call received is picked up. With Extension Pickup, the user can also pick up calls parked by a system operator by activating the Pickup feature then dialing the park zone.

■ **Line Pickup.** If the telephone has more than one call on hold or ringing on an outside line, the user can activate the Pickup feature then dial the line number (801-880) to select the specific outside line with the call. Line Pickup can also be used to make announcements by using a loudspeaker paging system.

■ **General Pickup.** Multiline users can program a general-purpose Individual Pickup button, instead of dialing the Pickup code, to pick up calls at specific telephones or on specific outside lines.

Group Pickup	Group Pickup is used to answer a ringing call for any member of the group by dialing the Group Pickup code or pressing a programmed general purpose Group Pickup button. The user does not need to know the extension number or line number of the ringing call. The system automatically connects the user to an inside or outside call that is ringing at a telephone assigned to the group.

A maximum of 30 Pickup groups can be assigned, each with a maximum of 15 telephones. A telephone cannot be assigned to more than one Pickup group. |

Telephone Differences

Individual Pickup

QCC System Operators	To pickup a call, the QCC system operator selects the feature from the Home screen or presses the Feature button and selects the feature from the display. The QCC system operator then presses the DSS button or dials the extension for the telephone. To pickup system operator-parked calls, the QCC system operator presses the DSS button or dials the extension for the park zone extension. To answer calls on specific lines, the QCC system operator dials the line number (801-880) with the call.
All Other Multiline Telephone Users	To pickup a call, all other multiline telephone users press a programmed general purpose Pickup button or press the Feature button and dial 9. MLX telephone users can also press the Feature button and select the feature from the display. To pickup a call ringing or on hold or parked at another telephone, the user then dials the extension number for the telephone. To pick up system operator-parked calls, the user dials the park zone extension. To answer calls on specific lines, the user dials the line number (801-880) with the call.

If a user has a Pickup button programmed for a specific telephone or outside line, the user presses that Pickup button to pick up a call. |
| **Single-Line Telephones** | To pickup a parked call, the single-line user lifts the handset (while listening to internal dial tone) and dials #9 and the extension number for the telephone or park zone where the call is parked. |

Group Pickup

QCC System Operators	To pickup a call ringing on any other group member's telephone, the QCC system operator selects the Group Pickup feature from the Home screen or presses the Feature button and selects the feature from the display. The system operator is connected to a call ringing at any group member's telephone.

All Other Multiline Telephone Users	To pick up a call ringing on any other group member's telephone, the user presses a programmed Group Pickup button or presses the Feature button and dials 88. The user is connected to a call ringing at any group member's telephone. MLX telephone users can also press the Feature button and select the feature from the display.
Single-Line Telephones	To pickup a call ringing at any other group member's telephone, the single-line user lifts the handset (while listening to internal dial tone) and dials #88.

Note: When the single-line telephone user is on a call and puts the call on hold to pickup another call by using Individual or Group Pickup, the user cannot put the picked-up call on hold to return to the first call. If the user presses and releases the switchhook or presses the Recall button, the picked-up call is dropped and the user is reconnected to the-original held call. If the user hangs up, the picked-up call is disconnected and the first call is considered on hold for transfer and is not returned to the user until after the Transfer Return interval.

Considerations

- A maximum of 30 Pickup groups can be assigned, each with a maximum of 15 members.
- A telephone cannot be assigned to more than one Pickup group.
- Individual Pickup is used to pick up calls parked at park zone extensions by system operators.
- When Group Pickup is used to answer a call, the user cannot determine whose call is being answered. A user with an MLX display telephone receives call information and can determine whose call is answered only after the call is picked up.
- MLC-5 cordless telephones cannot be assigned to Pickup groups.

Feature Interactions

Callback	A Callback request cannot be picked up at another telephone.
Call Waiting	Pickup features cannot be used to answer a waiting call at another telephone.
Conference	A conference call cannot be picked up at another telephone. A conference originator can, however, pick up a call and add it to the conference call.

Coverage	An Individual or Group Coverage sender or receiver can be a member of a Pickup group. This allows Pickup to be used to answer a ringing Individual or Group Coverage call. If a sender who is a member of a Pickup group uses Coverage On/Off to prevent calls from being sent to Individual or Group Coverage receivers, his or her calls can be picked up by using the Individual Pickup feature; however, calls cannot be picked up by using the Group Pickup feature. When a Coverage call is answered by using Pickup, the call appearance is removed from all other telephones in the Coverage arrangement.
Direct-Line Console	A DLC can be part of a Pickup group. This allows other group members to provide backup coverage for the DLC. The DLC system operator can use Pickup to answer calls on lines/trunks that are not assigned to buttons on the console.
Direct Station Selector	The DSS buttons associated with a line/trunk number (801-880) cannot be used to answer calls on specific line/trunks by using the Individual Pickup feature. These DSS buttons are used strictly to show busy or not busy status of each line/trunk.
Display	When a user with an MLX display telephone activates Pickup, the "Pickup Line/Ext:" prompt appears on the display. (The prompt is not displayed if a button programmed for a specific line or extension is used.) After the user enters the line or extension number to pick up the call, a confirmation message is displayed - for example, "Pickup: Outside" or "Pickup: Joe."
Forward and Follow Me	Pickup features cannot be used to answer calls being forwarded to an outside telephone number.
Group Calling	A calling group member can be a member of a Pickup group. Calling group members can use Pickup to answer a call (either a calling group or individual group member extension) that is ringing at another group member's telephone. Line Pickup can be used to pick up a call that is in the calling group queue.
Night Service	A call ringing at a Night Service group telephone can be answered from another telephone by using Pickup.
Paging	When the line number used for loudspeaker paging is not assigned to a button on a multiline telephone, a user can access the loudspeaker paging system by using Individual Pickup and dialing the loudspeaker paging port line number (801-880), or by programming a Pickup button specifically for the paging port line number.
Park	A parked call can be picked up by using Individual Pickup.

Personal Lines
If a call received on a personal line is transferred to another user who receives the call on a System Access or Intercom button and then puts the call on hold, another user who shares the personal line cannot select the shared Personal Line button to pickup the call. If the user who received the transfer and put the call on hold cannot return to the call, another user must use the line Pickup feature to pickup the call (for example, a system operator can take a message and disconnect the caller).

Queued Call Console
A QCC can be a member of a Pickup Group. QCC system operators can use Individual Pickup and Group Pickup only by selecting them from the display. Individual Pickup and Group Pickup are on the Home screen on QCCs.

Station Message Detail Recording
The extension of a user who picks up a call by using the Pickup feature is shown on the SMDR report.

System Access
If the Pickup feature is used to answer a call ringing at a System Access or Shared System Access button, the call is removed from the ringing telephone and moves to the System Access or Shared System Access button used to pick up the call. The green LED goes on next to the System Access button used to answer the call and all Shared System Access buttons programmed for that specific button.

Transfer
A transferred call can be answered by using Pickup features.

System Programming

■ Assign or remove telephones from Pickup groups.

```
Extensions -> Call Pickup
```

Related Features

■ Coverage

Pools

Description

Systems that operate in the Hybrid/PBX mode allow outside trunks to be grouped together by placing them in pools. Users select trunks by using System Access buttons instead of having a separate button for each trunk in the system. To access pools by using a System Access button, users dial pool dial-out codes. Pools can also be assigned to buttons on one or more telephones to allow the user to select the pool without dialing the pool dial-out code or ARS access rode. A Pool button for an individual pool can be assigned to a maximum of 64 telephone.

When the system is setup and the Hybrid/PBX mode of Operation is selected the system automatically groups trunks into the following pools:

■ All loop-start (basic and special-purpose) trunks are assigned to the main pool. The factory-set extension number for the pool is 70.

■ All dial-in tie trunks are assigned to the pool with the factory-set extension number 891.

■ All automatic-in tie trunks are assigned to the pool with the factory-set extension number 892.

Note: The factory setting for the type of trunk connected to a 400 GS/LS/TTR, 800 GS/LS, or 408 GS/LS module is loop-start. For this reason, the system does not automatically assign ground-start trunks to pools. In addition, the system does not automatically make pool assignments for loop-start, ground-start, or tie trunks that are emulated by using a T1 facility. Each of these types must be grouped into a pool through system programming.

The system can have a maximum of 11 pools. The number of trunks in each pool is only limited by the number of trunks connected to the system. However, a trunk can be assigned to only one pool.

Each pool should contain the same type of trunks (for example, basic trunks or WATS trunks) because users cannot control the specific trunks selected by the system. Ground-start and loop-start trunks can be mixed in the same pool. DID trunks and trunks used for Music-on-Hold or maintenance alarms cannot be grouped into pools. Also, it is recommended that dial-in tie trunks not be assigned to a pool if the pool is assigned to a button on the telephone.

Trunks assigned to pools cannot be assigned as personal lines (assigned to buttons) on any telephone except a DLC. However, calls that come in on trunks assigned to pools can be programmed to be received by one or more QCC system operators.

Mode Differences

Trunk pools are available only in the Hybrid/PBX mode of operation. They are not available in the Key or Behind Switch modes.

Note: When operating in the Behind Switch mode, users access the trunk pools in the host switch through their Prime lines.

Considerations

- A maximum of 11 pools is allowed.

- The maximum number of trunks allowed in each pool is limited only by the number of trunks connected to the system.

- The maximum number of Pool buttons that can be assigned to multiline telephones (excluding QCCs) is limited only by the maximum number of pools allowed (11) and the number of buttons on the telephone.

- A Pool button for an individual pool can be assigned to a maximum of 64 stations.

- When all trunks in the pool are in use, the green LED goes on next to the Pool buttons assigned to multiline telephones, and next to a corresponding DSS button.

- DID trunks and trunks used for loudspeaker paging, maintenance alarms, or Music-on-Hold cannot be grouped in pools.

- Special purpose trunks should not be combined in the same pool, for example, different bands of WATS trunks or FX trunks to different cities.

- Individual telephones can be restricted to deny dial access to particular trunk pools. See "Calling Restrictions" in this chapter.

Feature Interactions

Alarm
A trunk jack used for a maintenance alarm cannot be assigned to a trunk pool.

Auto Dial
Pool dial-out codes cannot be programmed on inside Auto Dial buttons. A pool dial-out code can be programmed on an outside Auto Dial button when a telephone number is also included. However, one or two pause characters must be programmed before the telephone number to allow time to receive the local telephone company dial tone. Pause characters are entered by pressing the Hold button.

Automatic Maintenance Busy
To provide optimum performance, Automatic Maintenance Busy should be enabled when a Hybrid/PBX system includes trunk pools.

Automatic Route Selection
ARS ensures appropriate and cost-effective use of trunk pools.

Callback	Callback can be used to complete calls to outside numbers in the Hybrid/PBX mode only when the call is made by using a pool in which all trunks are busy.
Calling Restrictions	Specific pools can be restricted from being used for outgoing calls by assigning a pool dial code restriction to telephones.
Coverage	Calls received on a sender's Pool button that is programmed for Immediate Ring or Delayed Ring are eligible for Individual or Group Coverage.
Direct-Line Console	A Pool button cannot be assigned to a DLC. The DLC system operator accesses pools by dialing the pool dial-out code from a System Access button or, on a digital DLC with a DSS, by pressing the DSS button associated with the pool dial-out code. Trunks assigned to pools cannot be assigned as personal lines (assigned to line buttons) on any telephone except a DLC.
Directory	When a pool dial-out code is included in the telephone number for a Personal or System Directory listing, one or two pause characters must be programmed immediately following the pool dial-out code to allow time to receive the telephone company dial tone. Pause characters are entered by pressing the Hold button.
Display	When a display telephone user selects a Pool button and lifts the handset, the display shows the label (if programmed) for the pool that was selected.
Forced Account Code Entry	When Forced Account Code Entry is assigned to a telephone and the user tries to dial an outside call on a Pool button without entering the account code, the telephone loses its dial tone.
Forward and Follow Me	A pool can be used to select the facility for forwarding calls to an outside telephone number. The user enters the pool dial-out code before the telephone number.
Group Calling	Trunks assigned to pools can be assigned to ring into a calling group. An incoming call on a trunk assigned to the pool rings on a System Access button even if the calling group member has a Pool button assigned to his or her telephone.
Line Request	Line Request cannot be used for a Pool button or for a busy pool.
Music-on-Hold, Paging	Trunk jacks used for Loudspeaker Paging or Music-on-Hold cannot be assigned to trunk pools.
Personal Lines	A personal line cannot be assigned to a pool.

Queued Call Console

Pool buttons cannot be assigned to a QCC, but a QCC system operator can use pools to make outgoing calls by selecting a Call button and dialing the ARS or pool dial-out code. A QCC system operator can be assigned to receive calls on trunks assigned to pools.

A Pool Status button is assigned as a fixed feature button on a QCC and provides the system operator with status of all the trunk pools (a maximum of 11). The system operator presses the Inspect button, followed by the Pool Status button, and busy or available status of trunk pools is shown on the display.

Speed Dial

A pool dial-out code can be included with the telephone number associated with a Personal Speed-Dial or System Speed Dial code. However, one or two pause characters must be programmed immediately following the pool-dial-out code to allow time to receive the telephone company dial tone. A pause character is entered by pressing the Hold button.

Station Message Detail Recording

When outgoing calls are made by using a pool, the trunk selected by the system is reported on the SMDR report.

System Numbering

Pool dial-out codes (the factory-set codes are 70 and 890-899) can be renumbered.

System Programming

■ Assign individual trunks to pools.

```
LinesTrunks ->   Pools
```

Related Features

■ Automatic Route Selection

Power Failure Transfer

Description

Power Failure Transfer provides incoming and outgoing service through the use of power failure telephones during a commercial power failure, or when the voltage drops below 90 volts for longer than 250 ms.

A power failure telephone is a single-line telephone connected to a power failure transfer (PFT) jack on a 400, 400 GS/LS/TTR, 800, 800 GS/LS, 408, or 408 GS/LS module. Each module has one PFT jack for a series of four line jacks.

When a power failure occurs, all calls are dropped and the power failure telephone automatically goes on. It can be used to make and receive calls on the line/trunk connected to the line jack in the lowest position in each series of four. System features and restrictions are not available during a power failure.

Telephone Differences

Multiline Telephones   Multiline telephones cannot be used as power failure telephones.

Single-Line Telephones   Touch-tone single-line telephones must be connected to line jacks with touch-tone lines/trunks; rotary single-line telephones must be connected to line jacks with rotary-dialing jacks.

Considerations

■ The power failure telephone does not function and cannot be used to make or receive calls when the system is operating normally.

Feature Interactions

Station Message Detail Recoding   During a commercial power failure, all calls are disconnected and no SMDR records are generated for these calls.

Hardware Requirements

■ If ground-start trunks are used in the Hybrid/PBX mode, a KS23566,L1 ground-start button (PEC 31021) is required for power failure telephones (see Chapter 5).

Privacy

Extension Programming

> **Programming Code:** *31
> **Feature Code:**
>   **On:** 31
>   **Off:** *31
> **MLX Display Label:** Privacy [Prvcy]

Description

Privacy is used when an outside line or System Access button (Hybrid/PBX only) is assigned to a button on more than one telephone. The feature allows a user to prevent other people from accidentally or intentionally connecting to a call on the shared outside line or Shared System Access button. When a user activates Privacy by using a programmed button or dialing a feature code, other people selecting that line hear silence instead of being connected to the call. In addition, Privacy prevents other users from using Barge-In to interrupt a call.

Telephone Differences

Multiline Telephones

QCC system operators cannot use Privacy.

On all other multiline telephones, Privacy can be activated while a call is in progress, or before making or receiving a call. Privacy remains active until canceled.

A multiline telephone user activates Privacy by pressing a programmed Privacy button (the green LED goes on) or by pressing the Feature button and dialing 31.

To cancel Privacy, the user either presses the programmed Privacy button (the green LED goes off) or presses the Feature button and dials *31.

Single-Line Telephones

Privacy can be activated while a call is in progress, or before making or receiving a call. Privacy remains active until canceled.

A single-line telephone user activates Privacy while a call is in progress by pressing and releasing the Recall button or switchhook and dialing #31. To return to the call, the user presses and releases the Recall button or switchhook again. To activate Privacy before making or receiving a call, the user lifts the handset (while listening to internal dial tone) and dials #31, then hangs up.

To cancel Privacy while a call is in progress, the user presses and releases the Recall button or switchhook and dials #*31. To return to the call, the user presses and releases the Recall button or switchhook again. To cancel Privacy before making or receiving a call, the user lifts the handset (while listening to internal dial tone) and dials #*31, then hangs up.

Note. If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to activate Privacy.

Mode Differences

Privacy prevents other users from joining calls on Shared System Access buttons in systems that operate in the Hybrid/PBX mode and on outside line buttons in all modes of operation.

Considerations

■ Multiline users should use a programmed button instead of *a* feature code to activate Privacy so that the LED next to the button indicates when Privacy is on.

■ Single-line telephone users receive no indication when Privacy is activated or deactivated.

■ Privacy can be activated while a call is in progress or before a call is made or received.

■ If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to activate Privacy.

■ Privacy remains active until canceled by the user.

Feature Interactions

Barge-In

Barge-In does not override Privacy. The Barge-In user hears a busy signal when trying to contact a person who is using Privacy.

Forward and Follow Me

When calls are forwarded to an outside number, Privacy is activated automatically while the system is dialing the outside telephone number. Users who share the personal line cannot join the call.

Headset Options

Privacy should be programmed when headset users with Headset Auto Answer have Shared System Access buttons or share one or more personal lines. Privacy keeps the users from competing for the same call. When two or more users answer the same call on a Shared System Access or Personal Line button, the red and green LEDs next to the button go on, but only one person can talk with the caller.

Multi-Function Module	The use of Privacy is not recommended for MFMs because the user does not have an LED to indicate when the feature is active.
Personal Lines	When an individual personal line is assigned to more than one telephone, users cannot select the Personal Line button to join a call if Privacy has been activated.
Queued Call Console	A QCC system operator cannot use Privacy.
Recall	The single-line telephone user with a Recall button must use the Recall button to activate or cancel Privacy during a call.
Signaling	Users can program and use signaling to get through to co-workers who have activated Privacy.
System Access	In the Hybrid/PBX mode, if Privacy is activated on the principal station for a System Access button or by another user with a Shared System Access button, other users, including the principal station, cannot join the call. If Privacy is activated after another user joins the call, it does not affect that person who joined the call, but no other users with a Shared System Access button can join the call.

Programming

Description

Through programming, the system can be customized and updated to satisfy the changing communications needs of the customer. System features are assigned and changed, and lines/trunks and features are assigned to telephones. The three types of programming are:

■ Extension Programming

■ Centralized Telephone Programming

■ System Programming

Table 2-2 at the beginning of this chapter provides a complete list of telephone and system operator features, their programming codes, and the telephones on which the features can be programmed. The table also shows which features can be assigned only through centralized telephone programming.

The features described in this chapter include an Extension Programming subheading, which contains the programming codes, feature codes, and MLX telephone display labels. Also, the System Programming subheading describes the system programming needed to activate the feature and the menu choices required to reach the appropriate screen, beginning with the choice from the System Programming menu.

Extension Programming

Extension programming allows telephone users and system operators to tailor their telephones to meet personal needs. Multiline telephone users can assign a wide range of features to buttons on the telephone. In addition, many other features can be programmed on both multiline telephones and single-line telephones that do not require button assignment, such as Call Waiting.

Users can program their telephones by dialing programming codes or, on MLX display telephones, selecting features from the display. When a telephone is in the program mode, the system considers it busy; therefore, no incoming calls ring at the telephone until it is back in the call-handling mode. See Appendix B, "General Telephone Programming Instructions," for instructions on how to program features on MLX, analog multiline, and single-line telephones.

Centralized Telephone Programming

See the System Programming book for instructions on programming features using centralized telephone programming.

Through centralized telephone programming, any feature that can be programmed by individual telephone users or system operators can also be programmed by using the system programming console or a PC with the System Programming and Maintenance (SPM) software (described next). In addition, the following features can be programmed only through centralized telephone programming (not by individual users):

■ Barge-In

■ Headset Hang Up

■ All Intercom buttons (Key and Behind Switch only)

■ All System Access buttons (Hybrid/PBX only)

System Programming

Initial system programming is done when the system is planned and installed. The system can be reprogrammed as the needs of the business change.

The system can be programmed using one of the following:

■ A system programming console, which is the MLX-20L™ telephone setup for programming.

■ A personal computer (PC) with System Programming and Maintenance (SPM) software, available in MS-DOS* or UNIX®.

Programming with the MLX-20L™

Detailed information on connecting and programming via a system programming console is in System Programming.

See System Programming for details on changing the programming jack.

The MLX-20L telephone is the only telephone that can be used as a system programming console (see Figure 2-15). The MLX-20L telephone must be connected to the first station jack on the first MLX module for initial programming of a new system.

For subsequent programming, the jack assignment can be changed. The system operator jack can be used, or a separate system programming jack can be designated to allow programming of the system without interfering with system operator call handling.

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* Registered trademark of Microsoft Corporation
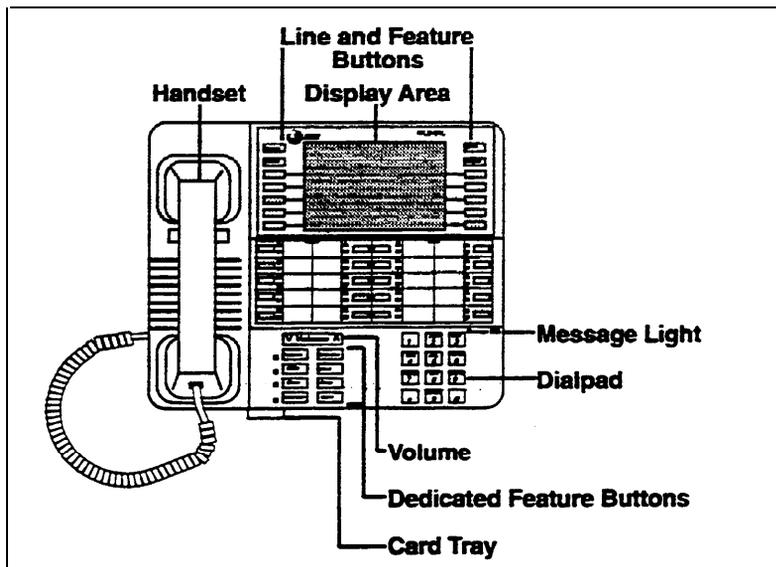
Figure 2-15   MLX-20L Telephone

The buttons next to the console's display are used to do most of the programming. The top two buttons on each side are labeled and have the same functions in every screen. They are Home, Menu, More, and Inspect.

The next five unlabeled buttons on each side are used to select options from a menu displayed on the screen.

Programming the system may also involve using the dialpad, some of the labeled function buttons on the lower portion of the console, or the 20 line and feature buttons in the center of the console. The overlay that "renames" buttons for use during programming is shown in Appendix E.

The red and green LEDs next to the 20 line and feature buttons assist you in programming the system. They will be on or off, depending on whether or not the line has been programmed.

Direct Station Selectors   One or two direct station selectors (DSSs) can be used with the MLX20L telephone. Each DSS adds 50 buttons to the system programming console. See "Direct Station Selector" in this chapter for a complete description of the DSS.

The LEDs on the DSS indicate the status of telephone features, such as Dialing Restrictions. Each LED on the DSS represents a telephone connected to the system.

When certain features are selected from the menu, the LEDs on the DSS indicate the status of the feature for each telephone. For example, if Restriction is selected from the Extensions menu, the red LED is on for each telephone that is toll-restricted.

Detailed information on connecting and programming via a PC with System Programming and Maintenance is in System Programming.

The advantage of programming the system with a PC is that all programming can be backed up on a floppy or hard disk. This makes recovery of system programming fast and effortless in the event of an inadvertent system shutdown or loss of power.

Note: Programming with a PC is recommended for systems operating in the Hybrid/PBX mode because of these backup and restore capabilities.

To program with a PC, the SPM software is needed along with MS-DOS* or UNIX® operating system software. SPM software provides interface to the programming and maintenance software in the control unit processor module.

Compare the SPM Display to Figure 2-15, MLX-20L

The SPM software emulates the display screen and buttons of a system programming console (the MLX-20L telephone). As shown in Figure 2-16, the SPM display mirrors the following three areas of the console:

■ Display and display buttons (at the top of the SPM screen).

■ Function buttons (described on the right side of the screen).

■ Line buttons (mirrored in the lower portion of the display.)

To use SPM for system programming, the PC must be connected to the control unit. This can be done either directly through the system programming jack on the control unit, or through a modem (modems can be used for either on-site or remote programming).
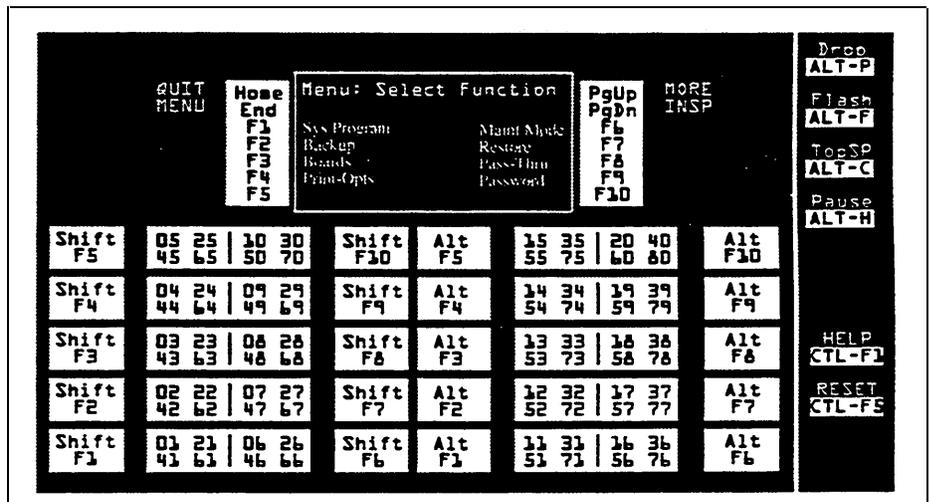
Figure 2-16   System Programming and Maintenance (SPM) Display

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* Registered trademark of Microsoft Corporation

On-Site and Remote Programming

PC-based SPM programming via a modem can be done either on-site or from a remote location. In both cases, the built-in modem of the control unit is used. Accessing the modem for on-site programming is done by dialing the code for the control unit's modem, which establishes connection to the system programming jack.

Accessing the built-in modem for remote programming can be done in any of the following ways:

■ Calling the system on a remote system-access line, entering a barrier code (if needed), and then dialing the code for the internal modem.

■ Calling the system on a regular line and asking the system operator to transfer the call to the modem.

■ Calling a remote location from the system, then transferring the call to the modem.

Remote programming allows AT&T personnel or authorized representatives to run diagnostic tests and to display information needed to maintain the system. It is also used by the National Service Assistance Center (NSAC) technicians for installation and maintenance support.

See the System Programming book for details.

Remote system programming overrides on-site system programming unless an on-site backup or restore procedure is taking place. If on-site system programming is being performed when a remote connection is attempted, the system sends a message to the programmer that a remote connection has been established, and the current on-site system programming session is terminated.

The system programming console display and SPM screen present step-by-step program prompts throughout programming. Three different types of screens appear on the console display and SPM screen:

■ **Menu Selection screens.** Allow selection of menu options. After making a selection, either a more detailed menu screen or a data entry screen is shown.

■ **Informational screens.** Show currently programmed information. Changes cannot be made to these screens.

■ **Data Entry screens.** Allow identification information (such as an extension number or line/trunk number) or values (such as number of seconds or rings) to be entered.

The menu heirarchy — the sequence of menu screens that appear as different options are selected from menus during system programming — is shown in Appendix G.

System Programming Reports

System programming reports are available when the Print choice is selected from the System Programming Menu. These reports can be printed on either the SMDR printer or on a printer connected to the PC used for system programming. See Appendix F for sample reports.

Queued Call Console

Description

The queued call console (QCC) is an answering position available only in the Hybrid/PBX mode. The QCC is used by system operators to:

■ Answer outside calls that are directed to a system operator position.

■ Answer inside calls.

■ Extend inside and outside calls to an extension or an outside telephone number.

■ Serve as a message center.

■ Make outside calls—for example, for users with telephones restricted from making outside calls.

■ Set up conference calls.

■ Monitor system operation.

QCC Operation

Outside calls programmed to ring at a QCC are sent by the system to a common QCC queue where they wait to be sent to a QCC system operator console. When a QCC system operator is available to receive a call, the system removes the call from the queue and sends it to an idle Call button on the QCC.

Calls are delivered to the system operator on a "first in, first out" basis according to the call priority level assigned to each type of call. If more than one system operator is available, the system operator who has been idle the longest receives the call.

A system operator is considered available to receive calls from the queue when there are no active calls at the console, or when an active call is put on hold or released from the console. A system operator is considered unavailable to receive a call from the queue under the following conditions:

■ A call is ringing on the console.

■ The system operator is on a call.

■ The system operator has a call in the split condition.

■ The system operator is setting up a conference.

■ All Call buttons are busy.

■ The console is being used for system programming.

■ The console is in the maintenance mode.

■ The system operator is in the process of programming a Personal Directory listing or the Alarm Clock.

■ The console is not plugged in.

Both inside and outside calls ring on Call buttons on the QCC. Unlike the direct-line console (DLC) on which many incoming calls can ring simultaneously. the QCC receives one call at a time, regardless of the number of incoming calls to the system. When a call rings on a Call button, call origin information is shown on the display.

To direct calls to other users, the system operator presses the Start button or a DSS button. The call automatically goes on hold at the Source button (the green LED next to the Source Button flashes). An outside caller hears Music-on-Hold, if it is programmed, or silence if Music-on-Hold is not programmed. An inside caller hears silence, and the system operator hears a dial tone on the same Call button. The display shows that the call is split. If the Start button was pressed first, the system operator can use the dialpad, a Directory feature, or a DSS button to dial the number.

If the Extended Call Completion option is set for manual completion, and the system operator uses a DSS button to dial, the system operator can speak to the person at the extension. while the call is in the split condition, the system operator can speak with the caller by pressing the Source button. The green LED next to the Destination button flashes to indicate the destination is on hold and the system operator is connected to the original caller. If the system operator needs to converse with both people (source and destination), pressing the Join button connects all three people together. To complete the call extending process, the system operator either presses the Release button to connect the call (the call is released from the console) or presses the Cancel button to cancel the extend process, drop the destination, and return the system operator to the original caller.

If the Extended Call Completion option is set to automatic completion, the extension is automatically dialed and the call is released as soon as the system operator presses the DSS button. In systems with Extended Call Completion set to automatic completion, if the system operator wants to consult with the person at the extension before connecting the call, the system operator can press the Start button then manually dial the extension by using the dialpad or a DIrectory feature.

QCC Features

The MLX-20L telephone is the only telephone that can be assigned as a QCC through system programming. A QCC system operator cannot use feature codes to activate features. The QCC system operator can only use the features that can be selected from the display or that are assigned as fixed features to buttons on the console. To simplify call handling, the Home screen includes features used often by a system operator: Camp-On, Pickup, Group Pickup, Loudspeaker Page, and Directory.

The 7-line, 24-character display also provides the system operator with descriptive information about incoming and outgoing calls. This information includes extension numbers and any programmed labels (such as names), trunk identifiers, reasons for call return and redirection, and the number of unanswered calls waiting in the queue. See "Display" in this chapter for details on call information displays.

The buttons on the QCC are factory-set with fixed features and cannot be programmed by the system operator or through centralized programming. The QCC fixed-feature buttons are shown in Figure 2-17.

Figure 2-17   QCC Fixed Features Assigned to Line Buttons

- ■ **Call.** Five Call buttons are assigned and used to answer incoming calls and make inside and outside calls.

- ■ **Start.** Initiates the call extending process by putting a caller on hold at the Source button and providing an internal dial tone to the system operator.

- ■ **Source.** Reconnects the system operator to the original caller while the call is in a split condition-the system operator has contacted the destination (the person receiving the call) but has not yet connected the call and has not used the Join button to establish a conference between the caller, the destination, and the system operator. If the system operator has not connected both parties by using the Join button, pressing the Source button puts the destination extension on hold and reconnects the system operator with the original caller. If the system operator connects the parties by using the Join button, pressing the Source button has no effect.

- ■ **Release.** Releases the system operator from a call and/or completes the call extending process making the system operator available for another call.

- ■ **Destination.** Reconnects the system operator to the destination while a call is in a split condition and after the system operator presses the Source button to talk with the caller. If the system operator has not connected both parties by using the Join button, pressing the Destination button puts the original caller (source) on hold and reconnects the system operator with the destination. If the system operator connects the parties by using the Join button, pressing the Destination button has no effect.

- ■ **Cancel.** Cancels call extending and reconnects the system operator with the caller (source). If the system operator is already connected to the caller, pressing the button has no effect.

- ■ **Join.** Connects the system operator with both the caller (source) and the person being called (destination) in a three-way conference. All three parties are connected on one Call button.

■ **Headset Mute** (Headset/Handset Mute). Activates or deactivates the headset or handset microphone. When the microphone is deactivated, the system operator can speak with another person without being heard by the caller. When headset operation is activated (green LED next to Headset Status button is on), pressing the Headset/Handset Mute button turns the headset microphone on and off. When headset operation is deactivated (green LED next to Headset Status button is off), pressing the Headset/Handset Mute button turns the handset microphone on and off. The red LED next to the button is on when the headset or handset microphone is off, and off when the headset or handset microphone is on.

■ **Headset Status.** Activates and deactivates the headset operation of the console. When headset operation is activated, the green LED next to the button is on and the system operator must use a headset or the speakerphone. When headset operation is deactivated, the green LED is off and the system operator must use the handset or the speakerphone.

■ **Headset Auto Ans** (Headset Auto Answer). Activates or deactivates the Headset Auto Answer feature when headset operation is activated by pressing the Headset Status button. The green LED next to-the Headset Auto Answer button is on when the feature is activated and off when the feature is deactivated. When the feature is active, the system operator with a headset hears a tone in the headset for 400 ms, followed by a 500 ms pause; the system operator is automatically connected to the incoming call. During this interval the transmit path of the console is disabled to prevent the system operator's private conversations from being heard by the caller. The feature can be activated during a call without disconnecting the caller and is effective immediately.

See "Messaging" in this chapter for details on the Send/Remove Message and Leave Message features.

■ **Send/Remove Message.** Turns on the telephone message LED to indicate a message waiting and turns off the message LED when all system operator messages are delivered. For telephones without a display, the Send/Remove Message feature is the only way the message LED can be turned on, unless the telephone is programmed as a message-waiting receiver for a fax machine or calling group, or the system has a voice messaging system connected.

■ **Position Busy.** Temporarily takes the system operator console out of service. When the console is in the position busy state, the green LED next to the button is on and the position does not receive calls from the QCC queue. However, the position does receive calls to the system operator's extension and Forward/Follow Me calls directed to the console. When the system operator puts the console in the position busy state, incoming calls and any calls already in the queue are directed to other available QCCs (regardless of whether they normally receive such calls) or, when all QCC system operators are in the position busy state, to the programmed backup calling group. The system operator can still make calls when the console is in the position busy state.

■ **Night Service.** Activates or deactivates Night Serice.

■ **Alarm.** Provides visible indication of a system alarm. When a system alarm has occurred, the red LED next to the button is on and the system operator can use Inspect to determine the number of alarms present.

■   **Pool Status.** Provides the system operator with status of all trunk pools (a maximum of 11). The system operator presses the Inspect button, followed by the Pool Status button, and busy or available status of trunk pools is shown on the display. The information includes the number of trunks and the number of busy trunks in each pool.

■   **Forced Release.** Disconnects the system operator from an active call and makes the system operator available to receive another call. If the system operator is in the split condition, disconnects the system operator from the caller (source) and the person being called (destination).

Each QCC can have one or two DSSs attached. The system operator can use the buttons during call handling, for example, to extend a call, make an inside call, park a call, or to see the availability of an extension. See "Direct Station Selector" in this chapter for detailed information on the use of the DSS.

QCC Options

The options assigned through system programming and available only for QCCs are described below.

QCC System Operator Receiving Calls

The QCC system operator assigned to receive calls on each trunk determines, first if incoming calls on each trunk ring into the QCC queue and, second, which QCC answers the calls on each trunk. The factory setting for all trunks assigns no QCC system operator to receive calls. This means that the trunk does not ring into the QCC queue.

Calls received on each trunk can be programmed to ring into the QCC queue, and one or more individual QCCs or all system operator positions can be specified to receive the calls. When a system operator receiving calls on a particular trunk is in the position busy state, any incoming calls are directed to other available QCCs that are programmed to receive calls on the trunk. If another QCC position programmed to receive the call is also in the position busy state, or if only one QCC position is programmed to receive calls on the trunk, the call is directed to any available QCC regardless of whether it normally receives such calls. When all QCC system operators are in the position busy state, calls received on trunks (including calls currently waiting in the queue) are sent to the programmed backup calling group.

Note: A system operator assigned to receive calls and QCC Queue Priority is not assigned to individual direct inward dialing (DID) trunks, dial-in tie trunks, or dedicated Remote Access trunks. The Call Types option (described below) is used to assign the system operator to receive calls and to assign the QCC Queue Priority for calls received on these types of trunks.

QCC Queue Priority

The QCC Queue Priority determines the priority (within the QCC queue) of types of calls received on each trunk programmed to ring into the QCC queue. A priority value of 1-7 is assigned, which determines the order in which calls are sent to QCCs. A value of 1 is the highest priority of calls and 7 is the lowest. The factory-set priority for calls received on trunks programmed to ring in the QCC queue is 4.

The values can be changed for each trunk according to the order that calls should be answered. For example, if important customer calls are received on particular trunks, a priority value of 1 should be assigned so that the calls are answered before any others. values of 2 through 7 should be assigned to trunks used for less important calls such as calls from equipment suppliers or from other business locations. Careful planning of QCC queue priority assures prompt answering of all important business calls.

Call Types

Call Types defines the types of calls that come into the QCC queue, the individual system operator that receives the calls, and the priority level. These calls are in addition to the calls that come in on trunks, (described above) and include the following:

■ Dial 0 calls (calls to the system operator).

■ Calls to unassigned (invalid) extensions received on DID or dial-in tie trunks, or by Remote Access users.

   Note: Calls to unassigned extensions can be programmed to receive a fast busy or to be directed to a backup position. The backup position can be any individual extension (including non-system operators), the QCC queue, or a calling group. Unless these calls are programmed to go to a backup position and the QCC queue is programmed as the backup position for these calls, assigning a system operator to receive the calls does not cause the calls to ring into the queue.

■ Calls to the Listed Directory Number (the extension for the QCC queue).

■ Returning calls—Unanswered extended, camped-on, held, and system operator-parked calls.

■ Group Coverage calls (the QCC can be designated to receive Group Coverage calls).

The following types of calls are assigned only a QCC Queue Priority Level and cannot be directed to an individual system operator position:

■ Calls signed in (Follow Me) or forwarded to the system operator.

■ Calls to a system operator extension number (for example, calls received from an inside or Remote Access user) or calls received on DID or dial-in trunks programmed to reach the system operator's extension.

The factory setting directs dial 0 calls, calls to the Listed Directory Number, calls to invalid destinations, and Group Coverage calls to the primary system operator position. For returning calls, the factory setting returns calls to the originators. The factory settings can be changed so that each type of call is directed to a different and/or additional QCC, or is not directed to any of the system operator positions.

If the calls are not directed to a system operator position and a user dials 0 or the Listed Directory Number, the caller hears a fast busy if the call was made on a DID or dial-in tie trunk, or by a Remote Access user. On other types of lines, the caller hears an error tone. If returning calls are not directed to a system operator position, the caller hears normal ringback, Music-on-Hold, or silence, and is not made aware by any special audible feedback that the call is not returning to the queue for further handling.

Elevate Priority

During high-volume calling periods, it is possible that only high-priority calls are being delivered to a QCC within a reasonable amount of time. low-priority calls can remain unanswered if there is a constant flow of higher priority calls.

Elevate Priority helps avoid this problem by allowing the system to automatically reprioritize calls held in the QCC queue. The setting determines the length of time (5-30 seconds in increments of 10 seconds) before calls waiting in the QCC queue are automatically reprioritized to a higher level. The factory setting is 0, which means that calls are not reprioritized.

When the QCC queue is reprioritized, the priority of every call in the queue is increased to the next higher level-for example, a call that is currently at a priority level of 4 is changed to the next higher priority level of 3. However, the priority of a call never reaches the highest priority (1) since these calls must reach the system operator as quickly as possible.

Hold Return

Hold Return determines whether calls put on hold at a QCC remain on hold at the system operator's console indefinitely or are returned to the QCC queue after the Hold Timer has expired twice. The factory setting is that calls remain on hold.

Automatic Hold or Automatic Release

Automatic Hold or Automatic Release determines whether a call in progress on a Call button is automatically put on hold (Automatic Hold) or released (Automatic Release) when the system operator presses another Call button. The factory setting is Automatic Release.

Calls-In-Queue Alert

When Calls-in-Queue Alert is enabled for an individual system operator, the system operator is alerted by a single tone every time a new call enters the queue (a system operator with a headset hears a tone through the headset). By monitoring the Calls-in-Queue Alert, the system operator can determine if heavy call volumes warrant the need for additional answering positions. The factory setting for Calls-in-Queue Alert is disabled for each system operator.

Queue Over Threshold	The Queue Over Threshold is the maximum number of calls allowed in the QCC queue before all QCC system operators are warned that many unanswered calls are waiting in the queue. The factory setting is 0, which means system operators are not notified when calls are in the QCC queue. The factory-set threshold can be changed to 1-99 calls, depending on the volume of incoming calls.

In normal call handling, line 3 of each system operator's display shows the number of calls currently in the system operator queue and the total number of calls in queue for all system operators. The information is updated each time a call enters or leaves the queue. When the number of calls in the queue is less than the threshold, the information is highlighted. When the number of calls is equal to or greater than the programmed threshold, the queue indicator is highlighted and blinking, and QCC system operators who are on a call hear a tone.

Note: When there are more than 99 calls in the queue, the display shows 99 until the number of calls drops below 99.

Extended Call Completion	The setting for the Extended Call Completion option determines whether or not the process of transferring calls (also known as extending or directing calls) is completed automatically when a QCC system operator with a DSS presses a DSS button after pressing the Start button. The following are the available settings for Extended Call Completion:

■ **Automatic (the factory setting).** The system operator can initiate the call transfer process, dial the extension, and complete the process by pressing the DSS button while on a call. The system operator does not need to press the Start button to begin the transfer process or the Release button to complete the transfer process. If the system operator chooses, the Start button can be pressed before pressing the DSS button. However, call transfer is automatically completed when the system operator presses a DSS button.

With the automatic setting for Extended Call Completion, the system operator can announce transferred calls only by pressing the Start button and then manually dialing the destination extension number.

■ **Manual.** The system operator can initiate the call transfer process and dial the extension by pressing a DSS button while on a call. However, the system operator must complete call transfers manually by pressing the DSS button and then pressing the Release button or hanging up. The system operator does not need to press the Start button to begin the transfer process. This allows the system operator to speak to the destination and/or announce the call before connecting the caller.

When a QCC includes a DSS, the factory setting is Automatic, which means that call transfer is automatically completed when the system operator presses a DSS button. With Automatic Release, the system operator can announce transferred calls only by pressing the Start button and then manually dialing the destination extension number. The setting can be changed to Manual (via system programming), which means that the system operator must complete call transfers manually by pressing the DSS button and then pressing the Release button or hanging up.

When Automatic Release is programmed and the system operator tries to transfer a call to an invalid extension (such as a paging group), the display shows "Denied: Cannot Release." This message also appears immediately (and does not time out) if the system operator presses the DSS button for the ARS or a pool dial-out code. The system operator can, however, dial the outside telephone number and release the call manually, even though the "Denied: Cannot Release" message is shown on the display.

Note: Camp-On cannot be used when Automatic Release is programmed and the QCC system operator presses a DSS button for a call transfer.

Position Busy Backup

Position Busy Backup designates a calling group to receive calls when all QCCs are in a position busy state. Only calling groups can be designated as QCC Position Busy Backup. If no calling group is assigned to provide Position Busy Backup, the system does not allow the last QCC system operator to activate position busy.

Return Ring Interval

The Return Ring Interval determines the number of rings (1-15) before an unanswered extended call returns to the QCC queue or returns to a QCC message center. The factory setting is 5 rings.

Message Center Operation

Message Center Operation is used to designate one or more QCC positions to function as a message center and receive the following types of calls:

■ System operator returning calls—returning transferred, parked, held, and camped-in calls.

■ Group Coverage calls.

■ Calls to unassigned (invalid) extensions received on DID or dial-in tie trunks or made by Remote Access users.

The factory setting is that no Message Center position is assigned and that returning calls are returned to the originator, calls to unassigned extensions go to the QCC console connected to the lowest numbered station jack, and Group Coverage calls are not programmed to ring at any QCC. When a Message Center is programmed, these calls are directed to the Message Center position. Other QCC system operators can be assigned to receive Group Coverage calls and calls to unassigned extension numbers; however, returning calls are directed to the Message Center and not to the originator.

The system operator position programmed as the Message Center position can also receive calls on individual trunks or other call types, in addition to the calls mentioned above, by assigning the position as the system operator to receive the calls.

Mode Differences

A QCC cannot be assigned in the Key and Behind Switch modes.

Considerations

■ The MLX-20L telephone is the only telephone that can be used as a QCC.

■ No more than four QCCs are allowed in a system.

■ A maximum of two QCCs can be assigned can each 008 MLX module. A QCC can be connected only on the first and fifth station jack on each module.

■ A system operating in the Hybrid/PBX mode can include both DLCs and QCCs (see "Direct-Line Console" in this chapter). The type of telephone used as a DLC determines the maximum number of combined consoles. The maximum numbers of both types of system operator positions is shown in Table 2-13.

Table 2-13   Maximum Number of System Operator Positions

Position Type	Type of Telephone	Size of Processor	Maximum Positions
QCC	MLX-20L	Small or large	4
DLC	MLX-20L MLX-28D	Small	6
DLC	MLX-20L MLX-28D	Large	8
DLC	Analog multiline telephones	Small or large	8

■ No more than eight system operator positions of any combination are allowed with either a small or large processor module.

■ When a system includes QCCs, the first MLX module used to connect QCC(s) must be installed in the control unit to the left of any other type of module with station jacks.

■ Only one QCC queue serves all QCCs.

■ Call buttons are automatically set to ring immediately. This setting cannot be changed.

■ Personal Line and Pool buttons cannot be assigned to a QCC.

■ Direct inward dialing (DID) trunks, dial-in tie trunks, or dedicated Remote Access trunks cannot be programmed to ring into the QCC queue.

■ Unless calls to unassigned extension numbers received on DID or dial-in tie trunks or from Remote Access users are programmed to go to a backup position, and the QCC queue is programmed as the backup position for these calls, assigning a system operator to receive the calls does not cause the calls to ring into the queue.

■ Trunks cannot be programmed to ring both into the QCC queue and into a calling group.

■ Trunks assigned to ring into the QCC queue can also be assigned as personal lines on one or more telephones.

■ Only one split condition can be active at any given time on a QCC console.

■ When a system operator on a call wants to make an outgoing call, he or she should press the Position Busy button before pressing the Hold button to temporarily make the console unavailable for calls from the queue. (The system operator can receive calls forwarded or made to the system operator's individual extension number.) If the system operator presses only the Hold button, the position is considered available for calls and a call can be delivered from the queue. This can prevent the system operator from making the outgoing call or cause the call ringing on the console to remain unanswered until the system operator finishes the outgoing call.

■ Only a calling group can be programmed to provide Position Busy backup when all QCC system operators activate position busy state.

■ If no backup position is programmed and only one QCC is assigned, or all other QCC positions are in a position busy state, the Position Busy button is not operable.

■ If two QCC system operators are on the same call, only one system operator hears the Calls-In-Queue Alert when the number of calls in the QCC queue is equal to or greater than the programmed threshold.

■ Voice announcements do not come in over QCC speakerphones.

■ QCCs cannot make voice-announced calls.

■ QCCs have no programmable buttons (all features are factory set) and cannot use feature codes.

■ If a QCC system operator receives a call and another user joins the call by using a shared Personal Line or Shared System Access button, the system operator can press the Start button to begin the transfer process and press the Join button to connect all three parties in a conference call. However, the system operator cannot release the call; the system operator sees the "Denied: Cannot Release" message on the screen.

■ This "Denied: Cannot Release" message appears immediately (and does not time out) if the system operator presses the DSS button for the ARS or a pool dial-out code. The system operator can, however, dial the outside telephone number and release the call manually even though the "Denied: Cannot Release" message is shown on the display.

■ When a QCC system operator is assigned to receive calls on a tie trunk (excluding dial-in tie trunks), and the caller at the other system uses the trunk and dials 0, the call is treated as an unassigned DID call type. The QCC system operator who receives the call sees "DID#" as the call type (along with the trunk label and trunk number) on the display, instead of seeing "Dial 0" as the call type.

■ Camp-On cannot be used when Automatic Release is programmed and the QCC system operator presses a DSS button for a call transfer.

■ The HFAI (Hands Free Answer on Intercom) button is not operable on a QCC.

Feature Interactions

Account Code Entry   A QCC system operator can activate Account Code Entry only by selecting the feature from the display and not through the use of feature codes.

Normally, account codes cannot be entered when a Group Coverage call is answered at a Coverage button programmed on a multiline telephone. However, when the QCC queue is programmed as the receiver for a Coverage group, the QCC system operator can enter account codes and the account code appears on the SMDR printout. This is because Coverage buttons are not required when the QCC queue is programmed as a receiver for a Coverage group.

Alarm   An Alarm button is assigned as a fixed feature on the QCC.

Auto Answer All,   Auto Answer All and Auto Answer Intercom cannot be assigned to a QCC.
Auto Answer Intercom

Auto Dial   Auto Dial buttons cannot be programmed on a QCC. For one-touch dialing of extensions, the system operator can use the buttons on a DSS or the Extension Directory. In addition, the system operator can use the System Directory and Personal Directory for one-touch dialing of outside numbers.

Automatic Line Selection   Automatic Line Selection on a QCC is a fixed sequence that starts at the lower Call button and moves upward. The sequence cannot be changed.

Barge-In   Barge-In enhances call handling by allowing the QCC system operator to contact a person who is busy on a call or using Do Not Disturb. The use of Barge-In does not override Privacy. On a QCC, Barge-In can be used only by pressing the Feature button and selecting it from the display.

Barge-In can be used to join only an inside call to a QCC system operator and only if the caller's extension number is dialed instead of the QCC system operator's extension number. If a user tries to use Barge-In after dialing a QCC system operator's extension and while waiting in the QCC queue, the feature has no effect and the user hears an error tone. If the error tone times out while the call is still in the QCC queue, the call is disconnected. However, if a QCC system operator becomes available before the error tone times out, the error tone is removed and the call is delivered to the system operator normally.

Callback   Calls to QCCs are not eligible for Callback since the calls ring into the QCC queue. Callback cannot be used on a QCC.

Calling Restrictions   Calling restrictions can be assigned to QCCs. Since restrictions apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.

Call Waiting,
Camp-On

A QCC system operator can release a call to a busy extension by selecting Camp-On from the display or by pressing the Release button. If Camp-On is used, the call does not return to the QCC queue until the Camp-On return interval expires. If the system operator presses the Release button, the extension being called receives the Call Waiting tone (not Camp-On) and the call returns to the QCC queue when the Transfer return interval expires.

To use Camp-On when the system is programmed for automatic Extended Call Completion, the system operator must press the Start button, dial the extension manually, activate Camp-On, then press Release. If the system operator presses a DSS button, the transfer is automatically completed and Camp-On cannot be used.

Confidence

When a system operator arranges a conference call on a QCC, all conference participants (a maximum of 5) are connected on one Call button. This allows the system operator to put the conference on hold and still have other Call buttons available to make or receive calls. However, since all participants are on one Call button, the system operator can drop only the last person added to the conference by pressing the Drop button and the Call button for the conference.

When a QCC system operator arranges a 3-participant conference (the system operator and two other participants) then presses the Release button or hangs up, the QCC system operator is released from the call and the other two participants remain connected. If the system operator arranges a 4- or 5-participant conference, pressing the Release button is ignored and has no effect if the system operator hangs up, the conference call is disconnected.

Coverage

An individual QCC cannot be a sender or receiver for Individual or Group Coverage. However, the QCC queue can be a receiver for 1-30 coverage groups by assigning one or more QCC system operators to receive the calls. The QCC queue can be assigned as a receiver in addition to multiline telephones programmed with Group Coverage buttons; however, the QCC queue is not counted in the eight-receiver maximum for each coverage group. The QCC Queue Priority and the individual system operator to receive group coverage calls are independently set for each group.

When the QCC queue is programmed as a receiver for a coverage group and a personal line on a coverage group member's telephone is also programmed to ring into the QCC queue, calls received on that personal line are not sent to the QCC queue as coverage calls. However, calls received on the personal line can be sent to multiline telephone Group Coverage receivers.

If Group Coverage buttons are programmed for a coverage group in addition to the QCC queue, and all QCC system operators are in Position Busy mode, a Group Coverage call does not go to a backup calling group.

When the QCC queue is programmed as a receiver for a coverage group and a call transferred to a group member is not answered, the call is returned to the queue as a transfer return if the QCC Return Ring interval is shorter than the Coverage Delay Interval. If the QCC Return Ring Interval is longer than the Coverage Delay Interval, the call returns to the QCC queue as a Group Coverage call.

Direct-Line Console	Both DLCs and QCCs can be assigned in the Hybrid/PBX mode. The maximum combined number of system operator positions is eight; no more than four can be QCCs. In a system with both DLC and QCC positions, the primary system operator position must be a QCC. All "dial 0" calls are directed to the QCC queue and do not ring at any DLC positions.
Directory	Directory features are used instead of Auto Dial to allow QCC system operators to dial extensions or telephone numbers with the touch of a button. The Extension Directory allows the system operator to locate and dial system extension numbers. The System Directory and Personal Directory can be used to locate and dial outside numbers.
	Directory features can be used for transferring calls. However, if a system operator releases the call immediately after pressing the button for the listing, the caller hears the dial tone plus the touch-tones for the dialed digits. If the system operator waits until after dialing begins, the caller does not hear the dial tone and dialed digits.
Disallowed Lists	Disallowed Lists can be assigned to QCCs. Since restrictions imposed by a Disallowed List assignment apply to the telephone used to initiate a call transfer to an outside number, a user with a restricted telephone can circumvent restrictions by asking a system operator with an unrestricted console to connect an outside call.
Display	Features not assigned to buttons on the QCC can be activated only by selecting them from the display. The system operator also uses the display for call information such as the person or extension calling, trunk identifiers, reasons for call return and redirection, and the number of calls waiting in the QCC queue.
	In a split condition, the QCC system operator sees information about the source and destination. If the QCC system operator presses the Home button while in the split rendition, the information is replaced with information about the source only. The system operator can restore the information by pressing the Source and Destination buttons or by pressing the Inspect button followed by the Source or Destination button.
Do Not Disturb	Do Not Disturb cannot be used on a QCC; Position Busy must be used instead. The green LED next to a DSS button on a DSS goes on when a user activates Do Not Disturb.
Extension Status	Extension Status cannot be used on a QCC and a QCC cannot be a calling group or CMS supervisor, or a calling group member.
Forced Account Code Entry	Forced Account Code Entry can be assigned to a QCC. However, Account Code Entry can be used to enter codes for outside calls only by selecting the feature from the display and not through the use of feature codes.

Forward and Follow Me

A QCC system operator cannot forward calls to extensions or telephone numbers. The system operator uses Position Busy instead to send calls to a backup calling group.

Calls that are forwarded to an individual QCC system operator or Follow Me calls that are signed in to a QCC can be assigned a queue priority. When the system operator uses Position Busy, forwarded calls and Follow Me calls signed into the QCC position continue to ring at the QCC.

Group Calling

Only a calling group can be programmed to provide Position Busy Backup when all QCC system operators activate Position Busy. If no calling group is designated to provide backup, the system does not allow the last QCC system operator to activate Position Busy.

A QCC cannot be a member of a calling group. A calling group can be a backup for calls in the QCC queue when all system operators are in the position busy state. The QCC queue can be designated to provide overflow coverage for calls from one or more calling groups. When an overflow call is sent to the QCC queue, it cannot be distinguished as a call to a calling group.

When the QCC queue is providing overflow coverage for a calling group and all QCC system operators are in position busy state, overflow calls do not receive position busy backup (they are not redirected to a second calling group providing position busy backup for the QCC queue) and continue to wait in the original calling group queue.

If all QCC system operators activate position busy while an overflow call is in the QCC queue, the call is rerouted to the original calling group and not to the calling group providing position busy backup.

Headset Options

Headset Auto Answer, Headset/Handset Mute, and Headset Status are assigned as fixed features on buttons on a QCC. Headset Hang Up cannot be programmed on a QCC.

The function of disconnecting calls served by the Headset Hang Up feature is replaced with Release, Forced Release, Camp-On, and Automatic Release via DSS buttons on the QCC.

Hold

Pressing the Hold button to put a caller on hold makes the system operator available for incoming calls from the QCC queue. The Operator Hold Timer reminds the QCC system operator that a call is on hold. After a programmed interval (10-255 seconds) the system operator hears an abbreviated ring when the interval expires the first time. If another call is received at the same time the hold timer expires, 10 seconds are added to the programmed Operator Hold Timer interval.

If the QCC system operator does not pick up a call by the time the hold timer expires twice, the call can be programmed to either remain on hold or return to the QCC queue. When the QCC Hold Return Option is set for calls to remain on hold indefinitely, the system operator hears the abbreviated ring every time the interval expires if no call is ringing on the console. If the QCC Hold Return option is set for calls to return to the queue, each call on hold at the system operator console is timed individually (a queue return timer is used for each Call button).

The DLC Operator Automatic Hold feature is not used for QCCs.

Inspect

When a conference participant joins a conference call by using a shared outside line or a Shared System Access button, the QCC display reflects the correct number of participants. However; if the QCC system operator uses the Inspect feature to verify the number of participants, the number shown on the display does not include participants joining the conference call on a shared button.

Pressing any of the buttons programmed with fixed QCC features (for example, a Call, Start, or Source button) while in the Inspect mode does not remove the console from the Inspect mode. However, pressing the Feature, Transfer, HFAI, Conference, Mute, Drop, Speaker, or Hold buttons does remove the console from the Inspect mode.

Last Number Dial
Line Request

Last Number Dial and Line Request cannot be used on a QCC.

Messaging

A QCC system operator can use Leave Message only by selecting the feature from the display. A Send/Remove Message button is programmed as a fixed feature on a QCC console.

Microphone Disable

The microphone on a QCC is automatically disabled and cannot be enabled.

Multi-Function Module

An MFM cannot be connected to a QCC console and cannot be assigned as a QCC. As a result, adjuncts such as answering machines and fax machines cannot be used with the console.

Night Service

A Night Service button is assigned as a fixed feature on a QCC.

If more than one QCC system operator is assigned to receive calls on an individual line/trunk, Night Service must be activated at all assigned positions before calls coming in on the line/trunk can ring on telephones programmed as members of the Night Service group. If Night Service is not activated on all of the QCC positions programmed to receive the calls, after-hours calls ring at that position and do not receive Night Service coverage.

While a system is in Night Service, unassigned DID extension and Listed Directory Number (the extension for the QCC queue) call types cannot be removed via system programming from ringing in the QCC queue. However, these call types can be removed via system programming from ringing into the QCC queue while Night Service is deactivated.

When multiple Night Service calls are received in the QCC queue at the same time and none of the calls are answered by a Night Service member (all group member Intercom or System Access buttons are busy), new calls are sent to the QCC queue and can be answered only by the QCC system operator. To avoid this situation, it is recommended that all outside lines assigned to ring on the QCCs be assigned as personal lines on at least one group member's telephone.

Paging

A QCC cannot make and receive voice-announced inside calls (speakerphone calls to an individual extension). A QCC cannot be a member of a speaker-phone paging group. A QCC system operator can use a loudspeaker paging system only by selecting the feature from the display and can use the Group Page feature by selecting a Call button and pressing the DSS button or dialing the extension for the group.

Park

Eight park dial codes are automatically reserved for parking calls from a QCC. The factory-set extension numbers are 881-888. To assign the park zones to a DSS connected to a QCC position, the extension numbers must be in the range programmed for the Page buttons.

A QCC system operator with a DSS parks a call by pressing the DSS button for the park zone or by pressing the Start button and then the DSS button. The call is automatically parked (the system operator does not need to press the Release button). A QCC system operator without a DSS cannot park calls.

To pickup a parked call, the QCC system operator presses the Feature button and selects Park from the display, then dials the extension number for the telephone or park zone where the call is parked.

Calls parked by QCC system operators can be programmed to return to the QCC system operator who parked the calls and/or to another QCC system operator. Returning parked calls are also assigned a QCC queue priority level (the factory setting is 4). With Message Center Operation, a call parked by a QCC system operator can be returned to the Message Center position.

Personal Lines

Personal lines cannot be assigned to a QCC.

Pickup

A QCC can be a member of a Pickup Group. QCC system operators can only use Individual Pickup and Group Pickup by selecting them from the display. Individual Pickup and Group Pickup are included on the Home screen on QCCs.

Pools

Pool buttons cannot be assigned to a QCC, but a QCC system operator can select pools to make outgoing calls by pressing a Call button and dialing the ARS or pool dial-out code. A QCC system operator can be assigned to receive calls on trunks assigned to pools.

A Pool Status button is assigned as a fixed feature button on a QCC and provides the system operator with the status of all the trunk pools (a maximum of 11). The system operator presses the Inspect button, followed by the Pool Status button, and the busy or available status of trunk pools is shown on the display.

Privacy

A QCC system operator cannot use Privacy.

Recall

A Recall button cannot be programmed on a QCC.

Reminder Service

Reminder Service Cannot be used on a QCC.

Remote Access

In the Hybrid/PBX mode, if QCCs are assigned and a Remote Access user does not enter the required digits within the timeout period or dials an invalid extension number, the call can be directed to one or more QCC system operators and/or to the Message Center if so programmed.

One or more QCC system operators can be assigned to receive calls on trunks assigned with Shared Remote Access. Calls received on trunks that are assigned Shared Remote Access receive Remote Access treatment only when all QCC system operators who are assigned to receive calls on Shared Remote Access trunks activate Night Service. If Night Service is deactivated on one or more QCC system operators assigned to receive the calls, calls ring into the QCC queue normally and do not receive the Remote Access treatment.

Ringing/Idle Line Preference

The Ringing/Idle Line Preference is fixed and cannot be changed on a QCC.

Ringing Options

Personalized Ringing cannot be programmed on a QCC, nor can Ringing Options be adjusted on a QCC. QCC system operators do not receive the abbreviated ring. The Call buttons are fixed to Immediate Ring. A QCC only receives two types of Distinctive Ring—one ring for an inside call and two rings for an outside call. A QCC does not receive the three rings that indicate a returning transferred call.

Saved Number Dial

Saved Number Dial cannot be used on a QCC.

Signaling

Notify and Signaling buttons cannot be used on a QCC. However, pressing a DSS button sends a manual signal to the station associated with the DSS button in the following instances:

■ The QCC system operator is "high and dry" (timed out from dial tone on a Call button or pressed the Forced Release button while listening to dial tone on a Call button).

■ The QCC system operator, in a split condition, pressed the Source button after contacting the destination but did not connect both parties by using the Join button. If the operator presses a DSS button, a manual signal is sent to the destination station.

Speed Dial

Personal Speed Dial and System Speed Dial cannot be used to dial numbers on a QCC. The Directory features can be used instead.

Station Message Detail Recording

When a QCC system operator arranges a 3-party conference (the system operator and two other participants) and presses the Release button, the QCC system operator is released from the call and the other two participants remain connected. Although this process is similar to a transferred call, the system operator's extension remains on the SMDR record.

System Access

System Access buttons are not assigned on a QCC. The QCC system operator uses Call buttons to make and receive inside and outside calls.

System Numbering

The Listed Directory Number (the extension number for the QCC queue) can be renumbered. The factory-set extension is 800.

Transfer

The QCC system operator uses the Start and Release buttons or a DSS button to transfer calls. However, pressing the Transfer button on a QCC console is the same as pressing the Start button. A system operator cannot make or receive voice-announced transfers. When a QCC system operator uses the Start and Release buttons to transfer a call, the Return Ring Interval applies for transfer return timing instead of the Transfer Return Interval.

Voice Announce to Busy

Voice announcements are cancelled on QCCs and cannot be activated. Voice-announced transfers cannot be made from the QCC.

System Programming

■ Assign or remove an individual QCC position.

```
Operator -> Positions -> Queued Call
```

■ Change the Operator Hold Timer from the factory setting of 60 seconds to 10-255 seconds system wide. The feature cannot be assigned to individual DLCs and is applicable to both DLCs and QCCs.

```
Operator -> Hold Timer
```

■ Assign QCC Queue Priority (1-7, the factory setting is 4) to individual trunks.

```
LinesTrunks -> More -> QCC Prior
```

■ Assign QCC system operator to receive calls on individual trunks. The factory setting assigns no system operator to receive calls on individual trunks.

```
Lines Trunks -> More -> QCC Oper
```

■ Specify that calls to unassigned (invalid) extension numbers received on DID trunks, dial-in tie trunks, or by Remote Access users receive a fast busy signal or are directed to a backup position (the factory setting). Calls must be directed to a backup position if QCC system operators who receive talk are assigned for this call type.

```
LinesTrunks -> DID -> InvalDstn
```

■ Specify that calls to unassigned (invalid) extension numbers received on DID trunks, dial-in tie trunks, or by Remote Access users are directed to the QCC queue. The factory setting directs calls to the primary system operator. Calls must be directed to the QCC queue if one or more system operators are assigned for this call type.

```
Options -> More -> Unassigned
```

■ Assign the call types that ring into the QCC queue, the system operator who receives the calls, and the priority level.

```
Operator -> Queued Call -> Call Types
```

■ Specify length of time (5-30 seconds, the factory setting is 0) before calls waiting in the queue are automatically reprioritized to a higher level (Elevate Priority).

```
Operator -> Queued Call -> ElvatePrior
```

■ Specify whether calls on hold return to the QCC queue after the Hold Timer has expired twice. The factory setting is that calls remain on hold.

```
Operator -> Queued Call -> Hold Rtrn
```

■ Select the Automatic Hold or Automatic Release (the factory setting) feature for all QCC positions.

```
Operator -> Queued Call -> HoldRelease
```

■ Enable or disable the Calls-in-Queue feature. The factory setting is disabled.

```
Operator -> Queued Call -> InQue Alert
```

■ Specify the number of calls in the QCC queue (0-99) before system operators are notified with a tone and/or on the display that the number of calls in queue is equal to or greater than the programmed threshold. The factory setting is 0, which means that system operators are not notified.

```
Operator -> Queued Call -> Threshold
```

■ Select Automatic (the factory setting) or Manual Extended Call Completion (only required when one or more system operators have a DSS).

```
Operator -> Queued Call -> ExtendComplt
```

■ Designate a calling group to receive calls when all QCCs are in the Position Busy state.

```
Operator -> Queued Call -> More -> QCC Backup
```

■ Specify the number of rings (1-15) before an unanswered transferred call returns to the QCC queue. The factory setting is 4 rings.

```
Operator -> Queued Call -> Return Ring
```

■ Assign one or more QCCs to serve as the Message Center Operation.

```
Operator -> Queued Call -> Msg Center
```

Hardware Requirements

Each console requires a port on a 008 MLX module.

Related Features

■ Direct-Line Console

Recall

Extension Programming	**Programming Code:** *775 **Feature Code:** 775 **MLX Display Label:** Recall [Recll]

Description

Recall is used to send a switchhook flash. When used on a personal line, Recall can be used only on loop-start lines/trunks or for systems subscribing to Centrex service. The destination of the switchhook flash depends on the type of telephone using Recall.

When a muitiline telephone user uses Recall on a personal line, the switchhook flash is sent to the central office. Ths allows a user to disconnect a call and get a new dial tone without hanging up. If the system uses Centrex services, the Recall feature accesses features provided by that service.

In the Behind Switch mode, when a multiline teiephone user presses the Recall button while on the Prime Line, the switchhook flash is sent to the host system and activates some features provided by the host system.

For multiline telephones, the Recall Interval is factory-set to hold the outside line open for 450 ms before accepting the first digit of the next telephone number dialed. If users experience difficulty with Recall, the interval can be changed to a longer or shorter interval.

Recall cannot be used for outside calls on a System Access button. However, Recall can be used when making an inside call on an Intercom or System Access button. Recall can be used to disconnect the call when the user is listening to the ringing on an unanswered inside call. However, Recall cannot be used to disconnect the call when the user reaches a busy extension. The user must press another line button, press the switchhook, or hang up to disconnect the call.

Recall can also be used by users whose single-line telephones are each equipped with a Recall button. A Recall button on a single-line telephone works differently than that on a multiline telephone.

Single-line telephone users cannot disconnect from a call and get a new dial tone. Pressing the Recall button sends a switchhook flash to the system, allowing the user to put a call on hoid, set up a conference call, transfer a call, and use other features. The single-line telephone Recall button transmits a timed switchhook flash of about half a second long.

Telephone Differences

Multiline Telephones

Analog multiline telephones have a dedicated Recall button that is programmed at the factory. MLX telephone users and MLC-5 cordless telephone users must program Recall on a line button.

To send a switchhook flash to the central office, the multiline telephone user presses the preassigned or programmed Recall button. An MLX telephone or MLC-5 telephone user without a programmed Recall button can press the Feature button and dial 775.

Single-Line Telephones

Only a single-line telephone equipped with a Recall button can use the Recall feature to send a switchhook flash to the system in order to activate features.

If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook for features that require a switchhook flash (for example, Transfer or Hold).

Mode Differences

Hybrid/PBX

Recall cannot be used in systems that operate in Hybrid/PBX mode to disconnect outside calls made on System Access buttons.

Behind Switch

In the Behind Switch mode, when Recall is used on a Prime Line, the switchhook flash is sent to the host system.

Considerations

■ Recall can be used only on personal lines and Intercom buttons. However, Recall can be used when making an inside call on an Intercom or System Access button.

■ When used on personal lines, Recall only works on loop-start lines or on systems subscribing to Centrex service.

■ Recall can be used on ringing (unanswered) inside calls when the call is made on an Intercom or System Access button. It cannot be used on an Intercom or System Access button when the user reaches a busy extension.

■ When a multiline telephone user presses the Recall button, the switchhook flash is sent to the central office. When a single-line telephone user presses the Recall button, the switchhook flash is sent to the system.

■ The Recall Interval should be reset when multiline telephone users are experiencing the following problems:

■ Multiline telephone user presses the Recall button and nothing happens. The interval is too short and should be increased to 650 ms or 1 second.

■ Multiline telephone user in a Behind Switch system presses the Recall button and is disconnected. The interval is too long and should be decreased to 350 ms.

■ If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook for features that require a switchhook flash (for example, Transfer or Hold).

■ Pressing the Recall button sends a switchhook flash and does not automatically dial the last number manually dialed.

Feature Interactions

Auto Dial

The Conference button is pressed to enter the Flash special character, which simulates pressing a Recall button, in a telephone number programmed on an Auto Dial button.

Automatic Route Selection

Recall cannot be used to hold onto an outside line if ARS was used to make the call.

Conference

A singe-line telephone user with a Recall button can add a participant to a conference call and connect all participants by using the Recall button. In addition, the Recall button can be used to drop the most recently added participant or to drop a busy number.

The Conference button is pressed to enter the Flash special character in an Auto Dial, directory listing. Personal Speed Dial, or System Speed Dial telephone number.

Display

When an MLX display telephone user presses a programmed Recall button while on an outside line, the line information is re-displayed as if the user had gone off-hook.

Directory

The Conference button is pressed to enter the Flash special character, which simulates pressing the Recall button, in a directory listing telephone number.

Hold

A single-line telephone user with a Recall button can press the Recall button to put a call on hold.

Park

A single-line telephone user can use Park if the telephone has a Recall button.

Privacy

A single-line telephone user with a Recall button can use the Recall button to activate or cancel Privacy during a call.

Queued Call Console	A Recall button cannot be programmed on a QCC.
Speed Dial	The Conference button is pressed to enter the Flash special character, which simulates pressing the Recall button, in a Personal Speed Dial or System Speed Dial telephone number.
Station Message Detail Recording	If a multiline user presses the Recall button to get a new dial tone, the SMDR timing is stopped for the previous call and timing begins for a new call.
System Access	Recall can be used on ringing (unanswered) inside calls when the call is made on an Intercom or System Access button. Recall cannot be used on an Intercom or System Access button when the user reaches a busy extension.
Transfer	A single-line telephone user with a Recall button can use the Recall button to transfer a call.

System Programming

■ Change the Recall Interval if users are experiencing difficulty in making calls after pressing the Recall button. The possible settings are 350 ms, 450 ms, 650 ms, and 1 second.

```
Options -> More -> RecallTimer
```

Reminder Service

Extension Programming

Programming Codes:
  Reminder Set: ***81**
  Reminder Cancel: ****81**
  Missed Reminder: ***752**
Feature Codes:
  Reminder Set: **81 + time + a or p**
  Reminder Cancel: ***81 + ext. no.**
MLX Display Label:
  Reminder Set: `Reminder, Set [Rmind, Set]`
  Reminder Cancel: `Reminder, Cancel [Rmind, Cancl]`
  Missed Reminder: `Reminder, Missed [Rmind, Missd]`

Description

With Reminder Service, users can arrange for the system to automatically make calls to telephones at preset times. Users can arrange and cancel Reminder Service for their own telephones. Direct-line console (DLC) system operators can arrange and cancel Reminder Service for any telephone in the system—for example, to alert several telephones as a reminder for a meeting or, in a hotel or motel, for wake-up call service.

When Reminder Service is arranged for a telephone, the system makes an inside call to the telephone at or close to the preset time (reminder calls may arrive up to three minutes before or after the set time). The call rings for 30 seconds or until the telephone is answered. When the call is answered, Reminder Service is canceled for that telephone.

If a reminder call is not answered or the telephone is busy, it is considered a missed reminder. If a system operator arranged Reminder Service for the telephone and the call was not answered, the green LED flashes next to the Missed Reminder button.

The system operator with a display console can press the Missed Reminder button to display a Missed Reminder Call message. The message identifies the name and extension of the missed reminder call, along with the set time for the reminder. The system operator can then use Reminder Service to resend the call to the extension. After resending the call, the system operator can clear the missed reminder by pressing the Missed Reminder button and the Reminder Cancel button.

Reminder Service Cancel can be activated via system programming to cancel all reminders at a preset time every day—for example, after business hours when all users are not available to answer reminder calls.

Telephone Differences

Multiline Telephones

Reminder Service cannot be used on a queued call console (QCC).

A multiline telephone user arranges Reminder Service for his or her own telephone by pressing a programmed Reminder Set button or pressing the Feature button and dialing 81, and then dialing a 4-digit time (0100 to 1259) and either 2 for a.m. or 7 for p.m. To cancel a reminder, the user presses a programmed Reminder Cancel button or presses the Feature button and dials *81.

A system operator with a DLC arranges Reminder Service for another telephone by pressing a programmed Reminder Set button or pressing the Feature button and dialing 81, then dialing the extension to be called, using the dialpad or an Auto Dial or DSS button, and then dialing a 4-digit time (0100 to 1259) and either 2 for a.m. or 7 for p.m. To cancel a reminder for another telephone or a missed reminder, the system operator presses a programmed Reminder Cancel button or presses the Feature button and dials *81, and then dials the extension, either using the dialpad, an Auto Dial button, or a DSS button.

Single-Line Telephones

A single-line telephone user arranges Reminder Service for his or her own telephone by lifting the handset (must be listening to internal dial tone), dialing #81, and then dialing a 4-digit time (0100 to 1259) and either 2 for a.m. or 7 for p.m. To cancel a reminder, the user lifts the handset (must be listening to internal dial tone) and dials #*81.

Considerations

- Reminder Service cannot be used on a QCC.
- Missed Reminder buttons can only be programmed on system operator display consoles because the display is needed to show which reminder was missed.
- Reminder Set cannot be used to set a reminder time when the green LED next to the Missed Reminder button is steadily on, indicating that the system operator can read missed reminder messages.
- Only one reminder can be set for a telephone at a time.
- Reminder Service does not have to be reset each time it is used; reminders carry over to the next day.
- Missed reminders can be canceled only by a system operator.
- The system time must be set to use Reminder Service.
- Reminder Service uses system time, which can differ from the time set by the user with an analog multiline display telephone.
- If a time for a reminder was previously set, it is not shown on display telephones when the Reminder Service button is pressed.
- Reminder calls may ring up to three minutes before or after the set time.

■ With Reminder Service Cancel, the user can program the system to cancel all outstanding reminders automatically at a preset time every day.

■ Reminder Service cannot be used on MLC-5 cordless telephones.

Feature Interactions

Callback   Reminder Service calls cannot be queued by using Callback.

Call Waiting   Reminder Service calls are not eligible for Call Waiting.

Coverage   Reminder Service calls are not eligible for Individual or Group Coverage.

Direct-Line Console   DLC system operators can use Reminder Service to set or cancel reminders for other users. The system operator can also see when a reminder was missed and cancel missed reminders. The Missed Reminder button can be programmed on system operator positions only.

Do Not Disturb   Reminder calls ring at telephones with Do Not Disturb activated.

Ringing Options   A Reminder Service call overrides programmed ringing options (delayed and no ring) and rings with a priority ring at an Intercom or System Access button.

Queued Call Console   Reminder Service cannot be used on a QCC.

System Access   A Reminder Service call overrides programmed ringing options (Delayed Ring and No Ring) and rings at the principal station; Reminder Service calls do not ring at Shared System Access buttons.

System Programming

■ Activate or deactivate Reminder Service Cancel.

```
Options -> Remind Svc
```

Remote Access

Description

The Remote Access feature allows employees to dial into the system by dialing
the number of a line or trunk designated for Remote Access. The remote user
should be required to dial a barrier code (password) after reaching the system.
After gaining access to the system, the remote user can:

■ Dial extension numbers directly without going through the system operator.
A remote employee can call internal telephones, data terminals, or calling
groups just as calls are made from an internal telephone.

■ Select a regular or special purpose (e.g., WATS) outside line (or, in the
Hybrid/PBX mode, a pool) or Automatic Route Selection (ARS) to make
outgoing calls. If the pool is busy, the system can be programmed to make
the remote user eligible for using Callback to put a call in queue for the busy
pool.

■ Arrange to have calls forwarded, change the forwarding destination, or
cancel call forwarding to a telephone inside or outside the system.

Note: Calls made via Remote Access to locations outside the system may vary
in transmission quality.

Remote Access also allows remote system programming and maintenance by
AT&T or an authorized representative.

Specific outside lines/trunks are assigned for either Dedicated or Shared
Remote Access. When Dedicated Remote Access is assigned to a line/trunk, all
incoming calls on that line/trunk receive the Remote Access treatment. When
Shared Remote Access is assigned to a line/trunk, incoming calls on that
line/trunk receive the Remote Access treatment only when Night Service is
activated on the system. Remote Access can be assigned to any outside line
connected to the system, except for DID or dial-in tie trunks. For DID and dial-in
tie trunks, Remote Access is possible when the remote user dials the Remote
Access code (the factory-set code is 889).

Remote Access treatment means that the system answers the call and the caller
receives a special dial tone. If a barrier code is required, the caller dials the
required 4-digit barrier and receives a second dial tone. If a barrier code is not
required, the caller can dial an extension, pool dial-out code, ARS code,
telephone number, or feature code.

When a call is received on a line/trunk assigned with Shared Remote Access,
and Night Service is not activated, the call rings at either the assigned
telephone, the system operator console, or a calling group.

Barrier Codes

To help safeguard against unauthorized system access, the system can be programmed to require that remote users enter a barrier code before gaining access to the system. AT&T strongly recommends the use of barrier codes.

Note: Under applicable tariffs, the customer is responsible for any charges incurred through the remote use of system facilities. To prevent unauthorized use of the system's outside lines by remote callers, also called "toll fraud," the following precautions should be taken:

■ Barrier codes should be changed frequently.

■ The lines and/or trunks to which Remote Access is assigned should be changed frequently.

See "Security of Your System-preventing Toll Fraud" at the front of this book for more detailed instructions on preventing toll fraud.

Barrier codes can be used for all lines/trunks. A maximum of 16 barrier codes are allowed, each with a different class of restrictions. The class of restrictions allows or denies the use of system features to individuals or groups of users.

Class of Restrictions

Class of restrictions are assigned whether or not barrier codes are used for Remote Access. The class of restriction assigned to each barrier code or, if barrier codes are not used, to all lines/trunks with Remote Access includes the following:

■ **Restriction.** Determines whether Remote Access users can make local and/or toll calls. The factory setting is outward restricted, the user can make inside calls only. The setting can be changed to unrestricted (the user can make local and toll or outside calls) or restricted (the user can make only local outside calls). When barrier codes are not used, restrictions are assigned to all lines/trunks and cannot be assigned to individual tie trunk or non-tie lines/trunks. When barrier codes are used, restrictions are assigned to individual barrier codes.

■ **Automatic Route Selection (ARS) Facility Restriction Level.** If the system uses the Automatic Route Selection (ARS) feature, the use of outgoing trunks by Remote Access users can be restricted by assigning a restriction level from 0 to 6. The factory setting, 0, is the most restrictive, and 6 is the least restrictive. The value assigned corresponds inversely to the Facility Restriction Level (FRL) assigned to the ARS route. To restrict remote users from using selected trunks, a value should be assigned that is less than the FRL assigned to the route. When barrier codes are not used, FRL is assigned to all trunks and cannot be assigned to individual trunks. When barrier codes are used, FRLs are assigned to individual barrier codes.

- **Allowed List Assignment.** Used when Remote Access users are restricted from making local and/or toll calls. Up to eight Allowed Lists enable restricted Remote Access users to call specific numbers (local or toll). When barrier codes are not used, Allowed Lists are assigned to all lines/trunks and cannot be assigned to individual lines/trunks. When barrier codes are used, Allowed Lists are assigned to individual barrier codes.

- **Disallowed List Assignment.** Used when a Remote Access user is not restricted from making calls. A Disallowed List is assigned to prevent the user from dialing specific numbers on the list. When barrier codes are not used, Disallowed Lists are assigned to all line/trunks and cannot be assigned to individual lines/trunks. When barrier codes are used, Disallowed Lists are assigned to individual barrier codes.

- **Automatic Callback.** The factory setting prevents a remote caller who reaches a busy trunk pool (Hybrid/PBX only) or extension from using the automatic Callback feature to request a trunk pool or extension. The factory setting can be changed to allow remote users to use automatic Callback to request busy trunk pools or extensions. Automatic Callback assignment applies to all Remote Access users and cannot be assigned to lines/trunks or barrier codes on an individual basis.

Considerations

- Up to 16 four-digit barrier codes can be programmed, each with its own restriction.

- Under applicable tariffs, the customer is responsible for any charges incurred through the remote use of system facilities. To prevent unauthorized use of the system's outside lines by remote callers, also called "toll fraud," the following precautions should be taken:

  - Barrier codes should be changed frequently.

  - The lines and/or trunks to which remote access is assigned should be changed frequently.

  See "Security of Your System-Preventing Toll Fraud" at the front of this book for more detailed instructions on preventing toll fraud.

- Only touch-tone telephone users can access the system remotely. Rotary dial telephone users are routed through the system operator.

- Remote Access calls ring on Intercom or System Access buttons; however, the telephone rings like an outside incoming call.

- Systems with DID trunks can designate a DID extension that off-site users can dial to use Remote Access.

- If a remote caller does not dial a number or feature code before the timeout period expires, the call is sent to a system operator or other designated telephone.

Feature Interactions

Account Code Entry	Account codes cannot be entered on calls made via Remote Access.
Allowed Lists	An Allowed List is one of the class of restriction (COR) items for Remote Access. When barrier codes are not used, Allowed Lists are assigned to lines/trunks system wide. When barrier codes are used, Allowed Lists are assigned to individual barrier codes.
Automatic Route Selection	Remote Access users can make calls by using ARS. The user dials into the system, enters a barrier code if one is required, and dials the ARS code while listening to system dial tone. FRLs can be assigned to restrict the routes that remote callers can use. When barrier codes are not used, an FRL is assigned to all lines/trunks and cannot be assigned to individual lines/trunks. When barrier codes are used, FRLs are assigned to individuals barrier codes.
Callback	If the system is programmed for Remote Access Callback, Remote Access users can use Callback. The user cannot hang up but must wait on the line until the extension or trunk pool is available. The user hears Music-on-Hold if it is programmed.
Direct-Line Console	Invalid Remote Access calls can be programmed to ring on an Intercom or System Access button on a DLC.
Disallowed Lists	Disallowed Lists are assigned as one of the items of the class of restriction (COR) for Remote Access. When barrier codes are not used, Disallowed Lists are assigned to lines/trunks system wide. When barrier codes are used, Disallowed Lists are assigned to individual barrier codes.
Display	Calls received via Remote Access show standard call information for outside calls, including the caller's number if automatic number identification (ANI) is available. If a Remote Access call is sent to Coverage because an invalid number was dialed, an MLX display telephone user who receives the call sees the "Cover DISA#?" message.
Forced Account Code Entry	Forced Account Code Entry cannot be assigned to Remote Access users.
Forward and Follow Me	Users can set up forwarding of calls to extensions or outside telephone numbers via Remote Access. To do so, the user calls into the system on a line/trunk that is programmed for Remote Access. If a barrier code is required, the user hears the Remote Access dial tone (stutter tone) and enters the barrier code. Once the barrier code is correctly entered or if barrier codes are not required, the user hears system dial tone.

If the user wants to forward calls to an extension, the user then dials #33 followed by the extension number. If the user wants to forward calls to an outside telephone number, the user dials #33, selects the line/trunk or pool on which to forward the call by dialing either the Automatic Route Selection (ARS), the pool dial-out code (Hybrid/PBX only), the Idle Line access code (9 for Key and Behind Switch only), or the line/trunk number (801-880). After selecting the outside line/trunk or pool to use, the user dials the destination telephone number followed by a # to signal the end of the dialing sequence.

Group Calling

Remote Access users cannot log into a calling group, but a Remote Access user can call into a calling group regardless of the restrictions applied. When the call rings at a calling group member's telephone, it rings as an outside call. A calling group can be programmed to receive calls from Remote Access users to invalid extensions. A line/trunk cannot be programmed for both Remote Access and to ringing into a calling group.

Music-on-Hold

A Remote Access user who is waiting for a busy trunk pool or extension hears Music-on-Hold.

Night Service

When Shared Remote Access is assigned to a line/trunk, incoming calls on that line/trunk receive the Remote Access treatment only when Night Service is activated on all system operator positions that receive calls on the line/trunk. When a call is received on a line/trunk assigned with Shared Remote Access and Night Service is not activated, the call rings at either the assigned telephone, the system operator console, or the calling group.

Paging

Loudspeaker paging cannot be accessed from outside the system via DID lines or Remote Access.

Queued Call Console

In the Hybrid/PBX mode, if QCCs are assigned and a Remote Access user does not enter the required digits within the timeout period, or dials an invalid extension number, the call can be directed to one or more QCC system operators and/or to the Message Center if so programmed.

One or more QCC system operators can be assigned to receive calls on trunks assigned with Shared Remote Access. When Night Service is deactivated on one or more QCCs assigned to receive the calls, calls ring into the QCC queue normally. When Night Service is activated, calls received on trunks that are assigned Shared Remote Access receive the Remote Access treatment.

Station Message Detail Recording

Remote Access calls are recorded only if SMDR is programmed to track incoming calls. If a barrier code is entered, the barrier code number (00-16) appears in the "Account Code" field of the report. If the caller uses Remote Access to dial an extension and the call is answered, the station's extension is shown in the "Station" field. If the call is not answered at the extension, the "Station" field is blank.

Remote Access **2-317**

If the caller uses Remote Access to dial out on a line or trunk, the "Station" field is blank on the first SMDR record and a second record is generated for the outgoing call.

A Remote Access user cannot enter account codes. However, if a Remote Access user calls an inside extension and the person at that extension enters an account code, the code overrides the barrier code number (00-16) printed in the Account Code column.

System Numbering

If the system includes DID or dial-in tie trunks, the number assigned to the trunk can be programmed to reach the Remote Access code. This allows Remote Access users to call in on the DID or dial-in trunk.

The Remote Access code can be renumbered. The factory-set Remote Access code is 669.

System Progmmming

■ Assigned Dedicated or Shared Remote Access to lines/trunks.

```
LinesTrunks -> RemoteAccss -> Lines Trunkst
```

■ If barrier codes are not used, assign class of restriction to lines/trunks.

```
LinesTrunks -> RemoteAccss -> Non-TIE or Tie Lines
```

■ Assign barrier codes and/or change class of restriction for each barrier code.

```
LinesTrunks -> RemoteAccss -> BarrierCode
```

■ Activate or deactivate Callback for busy pools (Hybrid/PBX only).

```
LinesTrunks -> RemoteAccss -> AutoQueuing
```

Ringing/Idle Line Preference

Extension Programming

```
Programming Code:
  Activate:      *343
  Deactivate:    *344
MLX Display Label: Line Prefer [LnPrf}
```

Description

Ringing/Idle Line Preference is used to automatically select a line that is ringing on a telephone (Ringing Line Preference) and to automatically select an available line for outgoing calls (Idle Line Preference).

When the system is first connected, Ringing/Idle Line Preference is activated. With Ringing/Idle Line Preference active, the system automatically connects to an available line when a user lifts the handset or presses the Speaker button to make a call. Incoming calls are also automatically connected when the user lifts the handset or presses the Speaker button.

A multiline telephone user can deactivate the feature so that the system does not automatically select ringing lines or available lines. The user must press a line button to select a line for outgoing calls and to answer ringing calls. The feature can be disabled or the line selected can be changed for single-line telephone users only via centralized telephone programming.

Mode Differences

Hybrid/PBX

When Ringing/ldle Line Preference is active in the Hybrid/PBX mode, and a multiline telephone user lifts the handset to make a call, the system searches for an available System Access line followed by any other type of line (for example, personal lines) assigned to the telephone. In the Hybrid/PBX mode, the Idle Line Preference code cannot be used to select an idle personal line.

For single-line telephone users, the system automatically connects the user to a System Access button. The single-line telephone makes outside calls by dialing the pool dial-out or the Automatic Route Selection code.

Key and Behind Switch

When Riging/Idle Line Preference is active in the Key or Behind Switch modes, the multiline telephone user is connected to an outside line assigned to the telephone. For single-line telephone users, the system automatically connects the user to an Intercom button. If the sequence is changed to an outside number, the single-line telephone user cannot use system features.

In the Key mode, the multiline or single-line telephone user selects an available outside line by dialing the Idle Line Preference dial code (normally a 9) on an Intercom button.

████████████████████████████████

Behind Switch

In the Behind Switch mode, the factory setting for Idle Line Preference selection is the Prime Line. The result is that single-line stations in the Behind Switch mode cannot make inside calls by using system extensions nor access system features.

Through centralized telephone programming, the Automatic Line Selection sequence can be changed to select an Intercom button followed by the Prime Line and/or outside lines. This allows the user to use system features. The single-line telephone user can make outside calls by using the Prime Line, or an available outside line by dialing the Idle Line Preference dial code (normally a 9) on an Intercom button.

Considerations

■ On a single-line telephone, Ringing/Idle Line Preference should always be activated. When Ringing/Idle Line Preference is deactivated, single-line telephone and data station users are not able to make and receive calls.

■ If the Idle Line Preference selection is changed to outside lines, the single-line telephone user cannot use system features.

■ If a multiline telephone user wants to override the line automatically selected by the system for a ringing call, he or she can preselect a different line by pressing that line button before lifting the handset or pressing the Speaker button.

■ When outside lines/trunks or pools are assigned to a single-line telephone, they are automatically added to the Idle Line Preference sequence.

■ Ringing Line Preference automatically selects the ringing line for calls received on System Access, Intercom, outside line, and Cover buttons that are programmed for Immediate or Delayed Ring.

Feature Interactions

Automatic Line Selection

Ringing/Idle Line Preference must be activated to allow the system to automatically select the lines programmed in the Automatic Line Selection sequence. In the Key and Behind Switch modes, an available outside or Prime Line (Behind Switch mode only) is selected by dialing the Idle Line Preference access code (usually a 9) on an Intercom button.

Headset Options

Ringing Line Preference does not operate if Headset Auto Answer is disabled while the MLX telephone is in the headset operation mode. When the Headset Auto Answer feature is active, Idle Line Preference does not operate, and the user must manually select a line button before making an inside or outside call.

When the telephone or console is in the headset operation mode, Idle Line Preference does not operate, and the user must manually select a line button before making an inside or outside call.

Multi-Function Module   Ringing/Idle Line Preference should be enabled for an MFM.

Queued Call Console   Ringing/Idle Line Preference is fixed and cannot be changed on a QCC.

System Numbering   In the Key and Behind Switch modes, the Idle Line Preference code (the factory setting is 9) can be renumbered.

Related Features

- Automatic Line Selection
- Ringing Options

Ringing Options

Extension Programming

Ringing Options

Programming Codes:
  All Outside Lines:
    Immediate Ring: *347
    Delay Ring: *346
    No Ring: *345
  Individual Lines, Cover buttons,
  Intercom/System Access buttons:
    Immediate Ring: *37
    Delayed Ring: *36
    No Ring: *35
MLX Display Label:
  All Lines: `RingOptions, All Lines [RngOp, AllLn]`
  Individual Lines: `RingOptions, One Line [RngOp, 1Line]`
    Immediate Ring: `RingOptions, Immed Ring [RngOp, Immed]`
    Delayed Ring: `RingOptions, Delay Ring [RngOp, Delay]`
    No Ring: `RingOptions, No Ring [RngOp, No]`

Abbreviated Ring

Programming Code:
  On: *341
  Off: *342
MLX Display Label:
  On: `RingOptions, Abbreviated, On`
                        `[RngOp, Abbrv, On],`
  Off: `RingOptions, Abbreviated, Off`
                        `[RngOp, Abbrv, Off]`

Personalized Ringing

Programming Code: *32 + ringing pattern number (1-8)
MLX Display Label: `PersonalRng (PRring)`

Send Ring

Programming Code:
  On: *15
  Off: **15
MLX Display Label:
  On: `SharedSARng, On [ShRng, On]`
  Off: `SharedSARng, Off [ShRng, Off]`

Description

Ringing Options allow users to program whether or not the telephone rings to alert the user of an incoming call on a specific line. Each telephone can be programmed to meet the individual needs of the user.

For Personal Line buttons (outside lines assigned to buttons on the telephone), Cover buttons (Primary, Secondary, or Group), and Intercom or System Access buttons (including Shared System Access buttons), each button can be programmed for Immediate Ring (the factory setting), Delayed Ring, or No Ring (the flashing green LED next to the line button is the only indication of an incoming call). When a user programs a Personal Line, Intercom, or System Access button for Delayed Ring, the user's telephone does not ring audibly until after two rings: This interval is fixed and cannot be changed.

However, if a user programs a Primary Cover, Secondary Cover, or Group Cover button for Delayed Ring, one of the factors that determines when the user's telephone rings audibly is the Delayed Ring Interval. The Delayed Ring Interval for the system can be set to 1-6 rings (the factory setting is 2 rings) via system programming. See "Coverage" in this chapter for complete details on ringing patterns for coverage calls.

Users can program each Personal Line button (an outside line assigned to a button), Cover buttons, and Intercom or System Access buttons on their telephones individually. The user can also program all personal lines by using the programming codes for all lines, which assigns the same ringing options to all personal lines. Cover, Intercom, and System Access buttons must always be programmed individually.

Note:
■   Ringing options cannot be programmed for Intercom or System Access Originate Only buttons since calls are not received on these buttons.
■   While using the programming codes or display selections to program all lines, the user must press any line button with an outside line or any System Access or Intercom button. The user receives an error tone, and a display telephone user sees an error message if the user presses any other type of button.

Abbreviated Ring

Abbreviated Ring allows the user (excluding a queued call console system operator) who is on the telephone to be notified with an abbreviated ring when another call is received on a button set for Immediate Ring or Delayed Ring. The telephone rings only once at a lower volume (attenuated ring). Users who prefer a normal ring for incoming calls can cancel the feature. The telephone then rings for an incoming call whether or not the user is on another call.

Note: Transfer returns ring until answered and do not receive Abbreviated Ring.

Distinctive Ring

Distinctive Ring allows a user to determine the origin of a call by listening to the ringing pattern. A pattern of one ring indicates an inside call, a two-ring pattern indicates an outside call, and a three-ring pattern indicates a returning transferred call. A priority call is indicated by four rings on an MLX telephone and by three rings on analog multiline and single-line telephones.

Note. A queued call console (QCC) system operator receives the inside call and outside call Distinctive Ring but does not receive the returning transferred call or priority ring.

When a call is transferred, the user hears one-ring pattern if the person transferring the call has not completed the transfer. If the person transferring the call completes the transfer before the user answers the call, the caller hears one ring to indicate the transfer of an inside call and then three rings to indicate a transfer of an outside call.

The exact timing of the distinctive ringing cycle for each type of telephone is shown in Table 2-14.

Table 2-14   Distinctive Ringing Patterns

Telephone Type	Inside Call	Outside Call	Transfer Return	Priority
Analog multiline	cccccccppppppp followed by 4 sec. of silence	cc—ppppppp followed by 4 sec. of silence	c-c—ppppppp followed by 4 sec. of silence	c-c—ppppppp followed by 4 sec. of silence
MLX	ppppppppp followed by 4.4 sec. of silence	ppppppppp-c followed by 4.2 sec. of silence	ppppppppp-c-c followed by 4 sec. of silence	ppppppppp-c-c-c followed by 4 sec. of silence
Single-line	1.3 sec. ring followed by 4.7 sec. of silence	.5 sec. ring, .3 sec. off, .5 sec. ring followed by 4.7 sec. of silence	.3 sec. ring, .2 sec. off, .3 sec. ring, .2 sec off, .3 sec ring followed by 4.7 sec. of silence	.3 sec. ring, .2 sec. off, .3 sec. ring, .2 sec off, .3 sec ring followed by 4.7 sec. of silence

p = 100 ms of personalized ringing
- = 100 ms of silence
c = 100 ms of tone

Personalized Ring

Each user (except a QCC system operator) can use Personalized Ring to change the telephone's ringing pattern so that the user can distinguish the ring from other telephones. The system has eight ringing patterns from which to choose.

On analog multiline telephones, the user hears the personalized ringing pattern at the end of the ringing cycle. On digital telephones, the user hears the personalized ringing pattern at the beginning of the ringing cycle.

Send Ring

The principal owner of a Shared System Access button can activate Send Ring which causes any Shared System Access buttons on other telephones that are programmed with delayed ring to ring immediately when the user is on the telephone. The feature can be activated or canceled by programming the principal System Access owner's telephone. The factory setting for Send Ring is active.

Telephone Diferences

Multiline Telephones

A priority call is indicated by a four-ring pattern on an MLX telephone and by a three-ring pattern on an analog multiline telephone.

Single-Line Telephones

Only Distinctive Ringing is operable on single-line telephones. However, off-premise single-line telephones do not receive distinctive ring treatment.

Mode Differences

Behind Switch

In Behind Switch mode, Prime Line buttons are factory-set for Immediate Ring. The factory setting can be changed.

Considerations

■ The factory setting for all outside lines, Intercom and System Access buttons, and all types of Cover buttons is Immediate Ring.

■ When a user programs a Personal Line, Intercom, or System Access button for Delayed Ring, the user's telephone does not ring audibly until after two rings. This interval is fixed and cannot be changed.

■ The Delayed Ring Interval programmed for the system can be set to 1-6 rings (the factory setting is 2 rings) via system programming. This interval applies only to Cover (Primary, Secondary, or Group) buttons programmed for Delayed Ring and does not apply to any other type of line button.

■ Ringing options cannot be programmed for Intercom or System Access Originate Only buttons since calls are not received on these buttons.

■ The factory setting for Abbreviated Ring is enabled.

■ Transfer returns ring until answered and do not receive Abbreviated Ring.

■ While using the programming codes or display selections to program all lines, the user must press any line button with an outside line or any System Access or Intercom button. The user receives an error tone, and a display telephone user sees an error message if the user presses any other type of button.

■ When one of the eight Personalized Ringing patterns is selected, the user can hear the Personalized Ringing pattern selected while in the extension programming mode. However, the Personalized Ringing pattern selected is not shown on MLX display telephones or on system programming report.

■ Delayed Ring is useful for people who provide backup coverage when the system operator is busy on another call, or for people who provide coverage for a co-worker's personal line.

■ No Ring is appropriate for people who do not usually answer outside calls. To answer a call when a telephone is programmed not to ring, the user simply presses the line button with the flashing green LED.

Feature Interactions

Auto Answer All   The analog multiline telephone user selects the lines to be answered by the device connected on a GPA by programming each line for Immediate or Delayed Rings. The lines not to be answered are programmed for No Ring. If the user wants the device to answer only inside calls, all personal lines must be programmed for No Ring.

Coverage   Primary Cover, Secondary Cover, and Group Cover buttons can be programmed for Immediate Ring, Delayed Ring, or No Ring. If an Individual or Group Coverage receiver is on a call when a coverage call is received, the receiver hears an abbreviated ring (if abbreviated ring is enabled). Calls received on a Primary Cover, Secondary Cover, or Group Cover button ring with the receiver's (not the sender's) Personalized Ringing pattern.

Forward and Follow Me On multiline telephones, calls forwarded to an extension ring with an abbreviated ring at the forwarding telephone and also ring at the destination telephone. On single-line telephones, calls forwarded to an extension ring at both the forwarding telephone and the destination telephone. On both multiline and single-line telephones, calls forwarded to a telephone number do not ring at the forwarding telephone.

Outside calls received at the forwarding station ring as an internal call at the destination station (one ring) and do not receive the normal distinctive ring for an outside call.

Group Calling

Abbreviated ring is not operable for calls to the calling group extension since a calling group member active on a call is considered unavailable for incoming calls. In the Hybrid/PBX mode, it is recommended that calling group members program System Access buttons for Immediate Ring.

Headset Options

Headset Auto Answer does not automatically answer calls ringing on buttons programmed for No Ring on an MLX telephone; the user must manually select the button to answer the call. When Abbreviated Ring is enabled, the user hears the abbreviated ring if another call rings while the user is on a call.

Multi-Function Module

The ringing patterns for tip/ring devices connected to an MFM are those of an MLX telephone rather than a single-line telephone—one ring for inside calls, two rings for outside calls, and three rings for priority ring or transfer return. Personalized ringing patterns cannot be programmed for an MFM. Centralized telephone programming must be used to program ringing options (Immediate Ring, Delayed Ring, or No Ring).

Night Service

When Night Service is activated, normal ringing options are canceled and Night Service calls received at a Night Service member's telephone ring immediately even if the line buttons are programmed for Delayed Ring or No Ring. When Night Service is deactivated, telephones reset to their programmed ringing options.

Queued Call Console

Personalized Ringing cannot be programmed on a QCC. Ringing Options cannot be adjusted on a QCC, and QCC system operators do not receive the abbreviated ring. The Call buttons are fixed to Immediate Ring. A QCC only receives two types of Distinctive Ring-one ring for an inside call and two rings for an outside call. A QCC does not receive three rings that indicate a returning transferred call.

Reminder Service

A Reminder Service call overrides programmed ringing options (Delayed Ring and No Ring) and rings with a priority ring at an Intercom or System Access button.

System Access

Intercom (Ring and Voice) and System Access (Ring, Voice, and Shared) buttons can be programmed for Immediate Ring, Delayed Ring, or No Ring. Ringing options cannot be programmed for Intercom or System Access Originate Only buttons since calls are not received on these buttons. The user hears an abbreviated ring when a call is received on Intercom buttons and System Access buttons that are programmed to ring when the user is already on a call.

Multiline telephone users can program personalized ring for Intercom and System Access buttons. Incoming calls on Shared System Access buttons ring with the personalized pattern assigned to the principal station.

The principal station in a shared System Access arrangement can activate Send Ring, which causes any Shared System Access button on other telephones that are programmed with Delay Ring to ring immediately when the principal station user is on the telephone. The feature can be activated or canceled by the principal station user.

Transfer

Transfer returns ring until answered and do not receive Abbreviated Ring.

System Programming

■ Change the number of rings programmed for the Delayed Ring Interval for Primary Cover, Secondary Cover Group Cover buttons programmed for delayed ring (1-6 rings, the factory setting is 2 rings).

```
Options -> Delay Ring
```

Saved Number Dial

Extension Programming

> **Programming Code: *85**
> **MLX Display Label: SaveNumDial [Save#]**

Description

Saved Number Dial allows a user to selectively save the last number dialed from a multiline telephone and call the number again without manually redialing. The user can save the number even if the person being called answers. The number saved is any extension or telephone number dialed by using one of the following methods:

■ The complete number is manually dialed on the dialpad.

■ The number is dialed by using a Personal Speed Dial code.

■ The number is dialed by using a programmed outside Auto Dial button.

Unlike Last Number Dial, the number saved by using Saved Number Dial is not replaced each time the user dials a new number by using any of the methods above unless the user presses the programmed Saved Number Dial button before hanging up.

Telephone Differences

Multiline Telephones

Queued call console (QCC) system operators cannot use Saved Number Dial.

Saved Number Dial requires a programmed button. To save a number by using Saved Number Dial, a multiline telephone user presses the programmed Saved Number Dial button before hanging up. The green LED next to the programmed Saved Number Dial button does not go on when the feature is used.

To redial a number by using Saved Number Dial, the multiline telephone user selects the appropriate line for the call and presses the programmed Saved Number Dial button. The number saved by the feature is dialed automatically. MLX display telephones users cannot use the feature by selecting it from the display, but can use the display to program the feature onto a button.

Single-Line Telephones

Saved Number Dial requires a programmed button and cannot be used on single-line telephones.

Mode Differences

Behind Switch

In the Behind Switch mode, when a user manually dials an outside number that includes a dial-out code (for example an Automatic Route Selection or pool dial-out code) required by the host system, the pauses required to wait for dial tone from some host systems are not automatically stored when Saved Number Dial is used. As a result, the user may either hear a fast busy signal or reach a wrong number when redialing the stored number by using Saved Number Dial.

Considerations

■ The number of Saved Number Dial buttons that can be programmed on each multiline telephone is limited only by the number of available programmable buttons.

■ A maximum of 16 digits is saved by Saved Number Dial.

■ Since the type of line button (Personal Line or Intercom/System Access) used to make the call is not stored, the user must select the appropriate line button before using Saved Number Dial to redial a number.

■ Unlike Last Number Dial, Saved Number Dial allows users to make calls to other numbers without affecting the number that is stored on the programmed button.

■ The green LED next to the programmed Saved Number Dial button does not go on when the feature is used.

■ Saved Number Dial does not store numbers dialed via an Extension, Personal, or System Directory; an inside Auto Dial button; a System Speed Dial code; or a DSS button.

■ If the multiline telephone user dials an incomplete number and presses the Saved Number Dial button before hanging up, the digits are saved.

■ If a user dials a telephone number and, after the call is connected, dials additional digits such as an account number or password, Saved Number Dial saves all the digits, including those dialed after the call is connected. In addition, if someone other than the owner of a display telephone presses the Saved Number Dial button, all dialed digits are shown on the display, including confidential information such as passwords or account codes.

■ Before pressing a Saved Number Dial button, the user must select the same type of line that was used to make the call originally. For example, if the user saved an extension number, he or she must select a System Access or Intercom button before pressing the Saved Number Dial button.

■ If the number dialed with an outside Auto Dial button or Personal Speed Dial code includes a special character such as Pause or Stop, the special character does not work when the number is redialed via Saved Number Dial.

Feature Interactions

Auto Dial
A numbered dialed by pressing a programmed outside Auto Dial button is saved for Saved Number Dial as if it were dialed with the dialpad, but special characters do not work. An extension dialed by pressing a programmed inside Auto Dial button is not saved for Saved Number Dial.

Automatic Route Selection
The ARS dial-out code is saved with the telephone number dialed.

Directory
Saved Number Dial does not store numbers dialed by using a Personal, Extension, or System Directory listing.

Direct Station Selector
An extension dialed by pressing a DSS button is not stored for Saved Number Dial.

Display
When a user presses a programmed Saved Number Dial button, the digits appear on the display as if the MLX display telephone user were dialing them from the dialpad.

Microphone Disable
When an MLX telephone user's microphone is disabled, pressing a Saved Number Dial button before lifting the handset turns on the speakerphone so the user can hear the number being dialed. However, the user must lift the handset to talk once the call is answered.

Saved Number Dial
Saved Number Dial cannot be used on an MFM.

Queued Call Console
Saved Number Dial cannot be used on a QCC.

Speed Dial
Telephone numbers that are dialed by using a Personal Speed Dial are stored by Saved Number Dial. If the number includes a special character such as Pause or Stop, the special characters do not work when the number is redialed by using Saved Number Dial. Telephone numbers that are dialed by using a System Speed Dial code are not stored by Saved Number Dial.

Station Message Detail Recording
All numbers dialed on an outside call by using Saved Number Dial are recorded on the SMDR report.

System Access
In the Hybrid/PBX mode, when Saved Number Dial is used on a call made with a Shared System Access button, the number is stored on the telephone by using Saved Number Dial and not on the principal station.

Transfer   The Saved Number Dial feature can be used to dial the outside number of the
                                 telephone to which the call is being transferred.

Related Features

■ Last Number Dial

Signaling

Extension Programming

Programming Codes:
 Signaling: *23 + extension number
 Notify:
   Send: *757 + extension number
   Receive: *758 + extension number
MLX Display Label:
 Signaling: Signal [Sig]
 Notify:
   Send: Notify, Send [Ntfy, Send]
   Receiver: Notify, Receive [Ntfy, Rcv]

Description

Signaling allows a user to signal another telephone without making a call to the extension. The meaning of the signal can be prearranged between the sending and receiving users. There are two types of Signaling:

■ Signaling (also called Manual Signaling)

■ Notify

Signaling

With Signaling, a multiline telephone user can send an audible signal to another telephone. To use the feature, the user presses a programmed Signaling button without lifting the handset. An audible tone is heard at the destination telephone for as long as the sender holds the button down.

In addition to sending an audible signal, the Signaling button can be used to see the status of the destination telephone. When the destination telephone user lifts the handset or uses Do Not Disturb, the green LED next to the Signaling button goes on.

The user can also use a Signaling button to automatically dial the destination telephone extension. However, the user must select a line and lift the handset or press Speaker before dialing an extension by using a Signaling button. Auto Dial automatically selects a line and activates the speakerphone.

Notify

With Notify, a multiline telephone user can send a visual signal to another telephone. For the feature to be used, a Send button must be programmed at the signal sender's telephone and a Receive button must be programmed at the signal receiver's telephone.

When the signal sender presses the programmed Send button, a green LED
next to both the Receive button and the Send button goes on. Both LEDs remain
on until the sender presses the Send button again or the receiver presses the
Receive button.

The visual signal sent is one way; if both users want to send and receive, both
telephones must be programmed with a Notify Send and a Notify Receive
button. Unlike Signaling, Notify cannot be used to see the status of the
telephones nor can it be used to automatically dial the extension.

Telephone Differences

Multiline Telephones

Both Signaling and Notify require a programmed button. Queued call console
(QCC) system operators cannot use either feature. Feature codes cannot be
used for either feature, and MLX display telephone users cannot select either
feature from the display.

Single-Line Telephones

Both signaling and Notify require a programmed button and cannot be used on
single-line telephones.

Considerations

- Signaling can be used even when both users are on the telephone.

- Signaling does not activate any external ringing devices connected to the
  destination telephone.

- To use Notify, two users must setup one telephone with a Send button and
  the other with a Receive button. If both users want to send and receive, both
  telephones must be programmed with Send and Receive buttons.

Feature Interactions

Auto Dial

A Signaling button and an Auto Dial button cannot be programmed for the same
extension. If a user tries to program an Auto Dial button when a Signaling button
is already programmed, or vice versa, the feature being programmed erases the
previously programmed feature.

Conference

Signaling can be used during a conference.

Direct Station Selector

If a user presses a Manual Signal button programmed with the system
operator's extension while making a call to the system operator, the LED next to
the user's DSS button changes from flashing to on steady while the Manual
Signal button is held down.

Do Not Disturb

Signaling cannot be used when the destination telephone user activates Do Not Disturb.

Group Calling

A Signaling button cannot be programmed for a calling group.

Messaging

If a display telephone user presses a Signaling button only to send an audible signal to a telephone with a posted message, the posted message at the destination is not shown on the display. However, if a display telephone user selects an Intercom or System Access button, lifts the handset, and uses the Signaling button to dial the extension, the posted message at the destination telephone is shown.

Multi-Function Module

When set for SAA operation, an MFM can receive a manual signal but cannot send one. An MFM cannot receive a manual signal when set for tip/ring operation.

Privacy

Users can program and use Signaling to get through to co-workers who have activated Privacy.

Queued Call Console

Notify and Signaling buttons cannot be used on a QCC. However, pressing a DSS button sends a manual signal to the station associated with the DSS button in the following instances:

■ The QCC system operator is "high and dry" (timed out from dial tone on a Call button or pressed the Forced Release button while listening to dial tone on a Call button).

■ The QCC system operator, in a split condition, pressed the Source button after contacting the destination but did not connect both parties by using the Join button. If the operator presses a DSS button, a manual signal is sent to the destination station.

Transfer

A Signaling button can be used to dial the extension during a transfer after the Transfer button is pressed. However, Signaling buttons cannot be used to initiate One-Touch Transfer.

Related Features

■ Barge-In

■ Messaging

Speed Dial

Extension Programming

Personal Speed Dial

Programing Code: # + Personal Speed Dial Code (01-24)
+ dial-out code + telephone number + #

System Speed Dial code assigned to a button:

Programming Code: *24 + System Speed Dial code
MLX Display Label: SysSpeedDl [SpdDl]

Description

Speed Dial allows users to dial outside numbers by dialing a two- or three-digit
code. There are two types of Speed Dial:

■ Personal Speed Dial

■ System Speed Dial

Personal Speed Dial

Personal Speed Dial is used only by single-line telephone users and users with
multiline telephones with 10 or fewer buttons (for example, MLX-10 and MLX-
10D telephones). Personal Speed Dial allows the user to program up to 24
frequently used numbers that can be dialed only from the user's telephone by
using a two-digit code.

The user can program a maximum of 28 digits, including special characters
such as Pause and Stop (see Appendix D for information on special characters),
for each Personal Speed Dial number. This allows the user to dial a two-digit
code for long numbers that require, for example, account codes, long-distance
company access codes, and area codes. In the Hybrid/PBX mode, the Personal
Speed Dial can also include pool dial-out codes or the Automatic Route
Selection (ARS) code. When dial-out codes are included, two pauses should
immediately follow the dial-out code to allow time to receive the telephone
company dial tone.

The Personal Speed Dial codes used to select the specific programmed number
are 01 to 24. Since each user has the same codes to choose from, the
telephone numbers associated with the codes only apply to the telephone on
which they were programmed.

System Speed Dial

System Speed Dial allows the system manager to program frequently used numbers that can be dialed by any user by using a three-digit code. For systems with the large processor module, up to 130 System Speed Dial numbers can be programmed; for systems with the small processor module, up to 40 numbers can be programmed.

A maximum of 28 digits, including special characters such as Pause and Stop (see Appendix D for information on special characters), can be programmed for each System Speed Dial number. In the Hybrid/PBX mode, the number can also include pool dial-out codes or the ARS code.

System Speed Dial numbers are programmed by using Labeling. The programmed labels include the name of the business or person being called and the number dialed. When a user with a display telephone uses a Speed Dial code to dial the number, the number being dialed appears on the display. The label can include a maximum of 11 characters.

For numbers that include confidential information, such as passwords or account billing numbers, the listing can be tagged in system programming to suppress the number dialed so that users with display telephones see only the code that was dialed (600-729) and not the number dialed. This is called a "marked" System Speed Dial code. When the number dialed via a marked System Speed Dial code includes a toll telephone number in addition to an access number, using the System Speed Dial code to dial the number overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone and a user with a restricted telephone can dial the number. In addition, the number is not printed on Station Message Detail Recording reports.

The System Speed Dial codes used to select the specific programmed number are 600-729 in systems with a large processor module and 600-639 in systems with a small processor module. The codes are available to all users except queued call console (QCC) system operators. On multiline telephones, line buttons can be programmed with individual System Speed Dial codes. Each System Speed Dial code must be programmed on a separate button.

Programmed System Speed Dial numbers are stored in the System Directory. MLX display telephone users can search the directory and select a listing by pressing a display button to dial a System Speed Dial number. Users with analog multiline display telephones or non-display telephones dial the same numbers by using the 3-digit System Speed Dial codes or by programming individual System Speed Dial codes onto a button.

Telephone Differences

Multiline Telephones

Personal Speed Dial

Personal Speed Dial can be used only on multiline telephones with 10 buttons or fewer.

To dial a Personal Speed Dial number, the multiline user presses the Feature button and dials the Personal Speed Dial code (01-24) associated with the number. For analog multiline telephones without a programmed Feature button, the user dials # and the Personal Speed Dial code.

Users with MLX-20L telephones can program a Personal Directory instead of Personal Speed Dial codes. Users with MLX-28D telephones and analog multiline telephones with more than 10 buttons should program Auto Dial buttons for quick dialing.

System Speed Dial

QCC system operators cannot use System Speed Dial.

To dial a System Speed Dial number, all other multiline telephone users press a System Speed Dial button programmed with the code. The user can also lift the handset, press the Feature button, and dial the System Speed Dial Code (600-729) associated with the number. For analog multiline telephones without a programmed Feature button, the user selects an Intercom or System Access button, lifts the handset, and dials # and the System Speed Dial code.

Single-Line Telephones

To dial a Personal Speed Dial or System Speed Dial number, the single-line telephone user lifts the handset (must be listening to internal dial tone) and dials # and the Speed Dial code (01-24 for Personal Speed Dial codes; 600-729 for System Speed Dial codes).

Mode Differences

Hybrid/PBX

In the Hybrid/PBX mode, pool dial-out codes or the Automatic Line Selection code can be included with the telephone number in Personal Speed Dial or System Speed Dial codes. To allow time to receive a local telephone company dial tone, one or two pause characters must be programmed immediately following a pool dial-out code (pauses are not needed following the ARS code) or an access code for a long-distance carrier. Pause characters are entered by pressing the Hold button.

When Automatic Route Selection (ARS) is used, # should be pressed twice to program a Personal Speed Dial or System Speed Dial code for a 7-digit toll number. This signals the end of the dialing sequence.

Behind Switch

In the Behind Switch mode, the user can program any dial-out codes required by the host system Personal Speed Dial or System Speed Dial codes.

To allow time to receive a local telephone company dial tone, one or two pause characters must be programmed immediately following a pool dial-out code, required by the host system, or an access code for a long-distance carrier. Pause characters are entered by pressing the Hold button.

Considerations

■ Each user can program up to 24 Personal Speed Dial numbers. However, the system maximum of 880 Personal Speed Dial numbers with a small processor module and 1200 Personal Speed Dial numbers with a large processor module may prohibit all users from programming a total of 24.

■ Personal Speed Dial numbers can be used only with single-line telephones and multiline telephones with 10 buttons or fewer.

■ For systems with the large processor module, a maximum of 130 System Speed Dial numbers can be programmed; for systems with the small processor module, 40 numbers can be programmed.

For information on pauses and other special characters, see Appendix D.

■ A maximum of 28 digits, including special characters such as Pause, Stop, or switchhook flash, can be used in a Personal Speed Dial or System Speed Dial number.

■ The System Speed Dial label can include a maximum of 11 characters.

■ When the number dialed by a marked System Speed Dial code includes both a toll telephone number and an access number, using the System Speed Dial code overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone and a user with a restricted telephone can dial the number.

■ The codes used for Personal Speed Dial are 01-24.

■ The codes used for System Speed Dial for systems with the large processor module are 600-729; the codes used for systems with the small processor are 600-639.

■ When a pool dial-out or ARS code is included in the dialing sequence associated with a Personal Speed Dial or System Speed Dial code, two pauses should be inserted immediately after the dial-out code. This allows enough time to receive outside dial tone.

■ Personal Speed Dial and System Speed Dial cannot be used from rotary dial telephones.

■ On multiline telephones, line buttons can be programmed with individual System Speed Dial codes. Each System Speed Dial code must be programmed on a separate button.

Feature Interactions

Account Code Entry

Multiline telephone users can use Personal Speed Dial and System Speed Dial to dial account codes. Single-line telephones cannot use Personal Speed Dial or System Speed Dial to dial account codes since the # required to use Speed Dial is also used to activate Account Code Entry.

Allowed Lists

When a marked System Speed Dial code is used to dial a number that includes both a toll telephone number and an access number, using the System Speed Dial code overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.

A user with an outward-restricted telephone cannot dial an outside number by using a Personal Speed Dial or System Speed Dial code (excluding a marked System Speed Dial code) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number using Personal Speed Dial or System Speed Dial (when the display of the number dialed is not suppressed) unless the number is on an Allowed List assigned to the telephone.

Automatic Route Selection   On Hybrid/PBX systems, Personal Speed Dial and System Speed Dial numbers can include the Automatic Route Selection (ARS) code.

Callback   When a Stop character is programmed as part of a Speed Dial number, the user must stay on the line and wait for the Callback call and then reactivate Speed Dial. This signals the system to continue dialing the digits following the Stop character.

Calling Restrictions   When a marked System Speed Dial code is used to dial a number that includes both a toll telephone number and an access number, using the System Speed Dial code overrides any calling restrictions (such as toll or outward restrictions) assigned to the telephone.

A user with an outward-restricted telephone cannot dial an outside number using a Personal Speed Dial or System Speed Dial code (excluding a marked System Speed Dial code) unless the number is on an Allowed List assigned to the telephone. A user with a toll-restricted telephone cannot dial a toll number using Personal Speed Dial or System Speed Dial (excluding a marked System Speed Dial code) unless the number is on an Allowed List assigned to the telephone.

Conference   The Conference button is pressed to enter the Flash special character in a Personal Speed Dial or System Speed Dial telephone number. The Drop button is pressed to enter the Stop special character in a Personal Speed Dial or System Speed Dial telephone number.

Direct-Line Console   System Speed Dial numbers, the system date, and the system time can be programmed from the first DLC connected to the first analog station jack.

Directory   System Speed Dial numbers are stored in the System Directory. MLX display telephone users can dial the numbers by selecting the name from the display. If the number is on a marked System Directory listing and includes a toll telephone number, the user can select the listing and dial the number regardless of any caling restrictions (toll and outward) assigned to the telephone. The Personal Speed Dial feature is replaced with the Personal Directory feature on the MLX-28D and MLX-20L telephones.

Disallowed Lists

A user with an unrestricted telephone cannot dial an outside number by using Personal Speed Dial or System Speed Dial if the number is on a Disallowed List assigned to the telephone, unless the number is dialed using a marked System Speed Dial code. If the number is dialed by using a marked System Speed Dial code and the number includes both a toll telephone number and an access number, dialing the number overrides any Disallowed List assignment.

Forced Account Code Entry

Multiline telephone users who use a programmed Account Code button or display telephone users who select the feature from the display can use Personal Speed Dial and System Speed Dial to dial account codes. Single-line telephone and multiline telephone users who complete the entry by dialing a # cannot use Personal Speed Dial or System Speed Dial to dial account codes since the # required to use Speed Dial is also used to activate Account Code Entry.

Hold

The Hold button is pressed to enter the Pause special character in Personal Speed Dial or System Speed Dial telephone numbers.

Labeling

The telephone numbers associated with System Speed Dial codes are programmed by using the same series of programming screens as those used to program labels for System Directory listings.

Last Number Dial

Telephone numbers that are dialed by using Personal Speed Dial are stored by Last Number Dial. If the stored number includes a special character, such as Pause or Stop, the special characters do not work when the number is redialed by using Last Number Dial.

Telephone numbers that are dialed by using a System Speed Dial code are not stored by Last Number Dial.

Pools

A pool dial-out code can be programmed on Personal Speed Dial and System Speed Dial numbers. When a pool dial-out code is included in the number dialed, one or two Pause characters must be programmed immediately following the dial-out code to allow time to receive a local telephone company dial tone. Pause characters are entered by pressing the Hold button.

Queued Call Console

Personal Speed Dial and System Speed Dial cannot be used to dial numbers on a QCC. The Directory features can be used instead.

Recall

The Conference button is pressed to enter the Flash special character, which simulates pressing the Recall button, in a Personal Speed Dial or System Speed Dial telephone number.

Saved Number Dial
Telephone numbers that are dialed by using a Personal Speed Dial code are stored by Saved Number Dial. If the number includes a special character, such as Pause or Stop, the special characters do not work when the number is redialed by using last Number Dial. Telephone numbers that are dialed by using a System Speed Dial code are not stored by Saved Number Dial.

Station Message Detail Recording
When Personal Speed Dial or System Speed Dial is used to dial an outgoing call, the actual digits dialed by the system appear on the report. However, when a marked System Speed Dial number is used, the Speed Dial code prints rather than the digits dialed.

Transfer
Both Personal and System Speed Dial can be used to dial the extension to which a call is being transferred.

System Programming

■ Program System Speed Dial numbers.

```
More  ->  Labeling  ->  System
```

Related Features

■ Auto Dial
■ Extension Directory
■ Personal Directory
■ System Directory

Station Message Detail Recording

Description

The Station Message Detail Recording (SMDR) feature is used to capture detailed usage information on incoming and outgoing voice and data calls. The information is sent to an optional output device such as a printer or an optional call accounting system.

SMDR records are gathered sequentially on a real-time basis and sent to the RS-232 SMDR jack on the processor module of the control unit. Or to assist further with cost allocation and unauthorized call detection, the information can be directed to a serial printer or PC with an AT&T Call Accounting System (CAS/B, CAS/H, CAT/B, or CAT/H) application. The printer or PC is also connected to the SMDR jack on the control unit.

Two SMDR report formats are available: the factory-set basic format or the ISDN format. The ISDN format is used when the business subscribes to the AT&T INFO2 automatic number identification service (ANI). When the ISDN format is selected during system programming, the number identification information is printed in the "Called Number" field of the call report. The rest of the fields are identical to the basic format.

Call information can be recorded for the factory setting of incoming and outgoing calls or for outgoing calls only. In addition, the system is factory-set to record only calls that last at least 40 seconds. The setting can be changed to 0-255 seconds.

For outgoing calls, the timing begins when the user selects a facility and lifts the handset. The timing restarts when dialing is completed (the system detects end-of-dialing). If incoming calls are included on call reports, the timing begins when a user answers the call. The timing is stopped for both incoming and outgoing calls when the call is disconnected. If the duration of the calls is more than the programmed amount of time for SMDR recording, the system generates an SMDR record.

Figure 2-18 shows a sample SMDR report.

```
  1   2        3            4          5        6    7              8
    DATE     TIME     CALLED NUMBER    DUR.     LINE STN.        ACCOUNT
  C 06/27/89 20:33          5553643   00:01:33  801  15  1234567890123456
  C 06/27/89 21:01       12125555436  00:02:44  804  14              9345
  C 06/27/89 21:02               IN   00:01:55  809  17
  I 06/27/89 21:12          5553633   00:00:55  802  16          99999905
  C 06/27/89 21:33         5553463*   00:11:33  801  15              9345
  D 06/27/89 21:53  355536431234555?  00:01:33  801  15              9345
```

Figure 2-18   Sample SMDR Report in ISDN format

A page heading indicates the name of each field in a record. An SMDR record consists of the following fields:

■ **Call Type** (column 1). In the basic format, "C" indicates a voice call and "D" indicates a data call. In the ISDN format, "I" indicates incoming voice calls On a PRI facility, "C" indicates all outgoing and incoming voice calls on non-PRI facilities, and "D" indicates all outgoing data calls.

■ **Date.** The date of the connection is shown in the mm/dd/yy format (mm = month, dd = day, yy = year). The leading zeros are not suppressed.

■ **Time.** The time of the connection is shown in the hh:mm format (hh = hour, mm = minute). The system time is used and is shown in 24-hour (military) time.

■ **Called Number.** For an outgoing call this is the dialed number or the Speed Dial numbers. In the basic format, an incoming call has only the word "IN" in this field. In the ISDN format, an incoming call on a PRI facility with number identification has the calling telephone number. However, any call on a line without number identification also has the word "IN" in this field. The maximum number of digits for the field is 15. The asterisk (*) indicates far-end disconnect if the call is on a supervised facility. The "?" indicates the number overflowed.

■ **Dur** (Duration). The duration of the call is shown in the hh:mm:ss format (hh = hour, mm= minute, ss = second).

■ **Line** (Facility Number). This is the outside line/trunk that was used to make or receive the recorded call.

■ **STN** (Station Extension). This is the extension that first answered or made the recorded call. The exception is an incoming call that is transferred to another extension, or is parked and picked up by another extension; the destination extension or the extension that picked up is then recorded.

■ **Account** (Account Code). The account code associated with incoming and outgoing calls is attributed to a specific project, department, or employee for billback purposes. For a Remote Access call, this field contains the barrier code preceded by six consecutive 9s. If an account number is also entered, the barrier code is overwritten.

Considerations

■ System programming report printing has a higher priority than printing out SMDR reports. SMDR records are queued until programming report printing is completed. Records are also queued if the printer is turned off, disconnected, or runs out of paper, or if a paper jam occurs. Up to 100 SMDR records can be queued. SMDR records generated after maximum capacity is exceeded may be lost.

■ System time and date must be set correctly to print accurate SMDR reports.

■ The maximum numbers recorded in the "Called Number" field is 15.

■ When the number included in the "Called Number" field contains both a dial equal access and a country code for an overseas call, the maximum digits recorded (15) may not provide enough information for call accounting software to process and cost the call.

■ Call information can be recorded for incoming and outgoing calls (factory setting) or for outgoing calls only.

■ The system is factory-set to record only those calls that last at least 40 seconds. The setting can be changed to 0-255 seconds.

■ Inside calls are not recorded on SMDR reports.

■ When a user joins a call on a shared line and continues on the call after the originator drops off, SMDR records the total duration of the call, up through the time the last person hangs up.

■ For outgoing calls, timing begins as soon as a user selects a line and lifts the handset. The timing is reset when dialing is completed (the system detects end-of-dialing). If a person selects a fine and cannot complete the call (for example, due to restrictions), yet is on the line for more than the programmed call duration, an SMDR record is created even though a call was never made on that line/trunk.

■ In the event of a power failure, any calls in progress and the SMDR records for those calls are lost.

Feature Interactions

Account Code Entry   The account code is printed in the "Account" field of the SMDR record.

Auto Dial   All numbers dialed on an outside call by using Auto Dial are recorded on the SMDR report.

Automatic Route Selection   SMDR reports for systems with ARS show all the digits dialed by the user in the "Called Number" field, including any digits absorbed by digit absorption and the facility used to make the call. The records do not include the ARS dial-out code or any digits added by ARS.

Callback
Call Waiting   SMDR begins measuring the duration of Callback calls when the call is completed. Similarly, Call Waiting calls are measured as soon as the call is answered.

Camp-On   If an incoming call is camped-on but is not picked up by the other extension, the extension of the user that activated Camp-On is shown in the "Station Extension" field of the SMDR report. If an incoming call is camped-on and picked up by the destination extension, the destination extension is shown in the "Station Extension" field of the SMDR report.

Conference   When a conference call includes inside and outside participants, records are generated only for outside participants. When a call is dropped from a conference call, it is considered a completed call and is sent to the SMDR print queue.

Coverage	The extension of the telephone on which an Individual or Group Coverage call is answered is shown on the SMDR report.
Forced Account Code Entry	The account code is printed in the "Account" field of the SMDR record.
Forward and Follow Me	If the system is programmed to track both incoming and outgoing calls, two SMDR records are generated when an outside call is forwarded to an outside telephone number. One record shows the incoming call, and the other record shows the call made to the destination telephone number with the forwarding telephone as the originator.
Group Calling	Calls to calling groups are associated with the first extension to handle the call. If the call is answered by the calling group delay announcement, the extension for the delay announcement device is recorded on the SMDR record even if the call is transferred to a calling group member or to an overflow group. The timing begins as soon as the calling group member or delay announcement answers the call. If the caller hangs up while listening to a delay announcement, the call is associated with the extension of the answering device.
Last Number Dial	All numbers dialed on an outside call by using Last Number Dial are recorded on the SMDR report.
Multi-Function Module	An MFM is treated as an MLX telephone on SMDR reports. The system waits until the end of dialing before sending a connect message to the MFM. Any digits dialed after the connect message is received are not recorded on SMDR reports.
Paging	Paging calls are not reported to SMDR.
Park	If an incoming call is parked but is not picked up by the other extension, the extension of the user who activated Park is shown in the "Station Extension" field of the SMDR record for the call. If an incoming call is parked and picked up by the destination extension, the destination extension is shown in the "Station Extension" field of the SMDR report.
Pickup	The extension of the user picking up the call via Pickup is shown on the SMDR report.
Pools	For outgoing calls made by using a pool, the trunk selected by the system is reported on the SMDR report.
Power Failure Transfer	During a commercial power failure, all calls are disconnected and no SMDR records are generated for these calls.

Queued Call Console

When a QCC system operator arranges a three-participant conference call (the system operator and two other participants) and presses the Release button, the QCC system operator is released from the call but the other two participants remain connected. However, the system operator's extension remains on the SMDR record.

Recall

If a multiline telephone user presses the Recall button to get a new dial tone, the SMDR timing is stopped for the previous call and timing begins for a new call.

Remote Access

Remote Access calls are recorded only if SMDR is programmed to track incoming calls. If a barrier code is entered, the barrier code number (00-16) appears in the "Account" field of the report. If the caller uses Remote Access to dial an extension and the call is answered, the station's extension is shown in the "Station Extension" field. If the call is not answered at the extension, the "Station Extension" field is blank.

If the caller uses Remote Access to dial out on a line or trunk, the "Station Extension" field is blank on the first SMDR record and a second record is generated for the outgoing call.

A Remote Access user cannot enter account codes. However, if a Remote Access user calls an inside extension and the person at that extension enters an account code, the code overrides the barrier code (00-16) printed in the Account column.

Saved Number Dial

All numbers dialed on an outside call by using Saved Number Dial are recorded on the SMDR report.

Speed Dial

When Personal Speed Dial or System Speed Dial is used to dial an outgoing call, the actual digits dialed by the system appear on the report. However, when a marked System Speed Dial number is used, the Speed Dial code prints rather than the digits dialed.

System Access

In the Hybrid/PBX mode, when a call is made with a Shared System Access button, the SMDR report records the extension that the call was made from and not the principal station extension number.

Transfer

The extension number for the station that hangs up on an incoming outside call is shown in the "Station Extension" field of the SMDR report regardless of how many times the call is transferred. For outgoing outside calls, the station extension that dialed the call is shown on the SMDR report even if the call is later transferred to another extension.

System Programming

■ Specify whether outgoing calls only or both incoming and outgoing calls are recorded. The factory setting is for both.

```
Options -> SMDR -> Call Report
```

■ Specify the duration of the call before SMDR begins to record information. The factory setting of 40 seconds can be changed to 0-255 seconds.

```
Options -> SMDF -> Call Length
```

■ Select the report format-basic (the factory setting) or ISDN.

```
Options -> SMDR -> Format
```

Related Features

■ Forced Account Code Entry

■ Account Code Entry

System Access

Extension Programming

Programming Codes:
 Assign buttons (centralized telephone
 Programming only, factory-set type is Ring):
  Intercom or System Access: ***16**
  Intercom or System Access
   Originate Only: ***18**
  Shared System Access: ***17 + Primary extension**
                                        `number`

 Change type of buttons:
  Ring: ****19**
  Voice: ***19**

 MLX Display Label:
  Assign buttons (centralized telephone
  Programming only:
   Intercom or System Acces: `SysAccess`
   Intercom or System Access
    Originate Only: `SysAcc – 00`
   Shared System Access: `ShareSysAcc`
  Change type of Intercom, System Access:
  or Shared System Access button:
   Ring: `Voice Annce, Place,`
                            `Ring [Voice, Place, Ring]`
   Voice: `Voice Annce, Place,`
                          `Voice [Voice, Place`
                          `Voice]`

Description

System Access is assigned to buttons on all telephones connected to the system. The function of System Access buttons depends on the mode programmed for the system.

In the Hybrid/PBX mode, System Access buttons can be used to:

■ Make an outside call by using an Automatic Route Selection code followed by a telephone number.

■ Dial an outside call via a trunk pool by dialing the pool dial-out code followed by the telephone number.

■ Make an inside call.

■ Activate a feature by using a feature code.

■ Receive inside and outside calls, including voice-announced inside calls.

In the Hybrid/PBX mode, the factory setting for Automatic Line Selection (ALS) selects a System Access button. Ringing for all types of System Access buttons is set to Immediate Ring and can be changed to Delayed Ring or No Ring.

In the Key and Behind Switch mode, System Access buttons are called Intercom buttons. Intercom buttons are used to:

■ Make an inside call; outside calls cannot be made on an intercom button.

■ Activate a feature by using a feature code.

■ Receive inside calls, including voice-announced inside calls.

■ Receive outside call transferred by another user.

■ Dial the Idle Line Preference code to select the first idle personal line assigned to the telephone (Key mode only).

For multiline telephones in the Key mode, the factory setting for Automatic Line Selection selection outside-line. For single-he telephones, ALS is factory-set to select an Intercom button. In the Behind Switch mode, the Automatic Line Selection factory setting for both multiline and single-line telephones selects the Prime Line.

Ringing for Intercom buttons is factory-set to Immediate Ring. This can be changed to Delayed Ring or No Ring.

Three types of Intercom or System Access buttons are available Ring, Voice, and Originate Only. In the Hybrid/PBX mode only, a fourth type is available-Shared. A minimum of one Intercom or System Access button or a combination of up to ten intercom or System Access Voice, Intercom or System Access Ring, Intercom or System Access Originate Only, or Shared System Access buttons can be assigned to each station. Queued call consoles (QCCs), which use Call buttons instead of System Access buttons, are excluded. intercom or System Access buttons can be assigned only in centralized telephone programming.

Intercom or System Access Ring Button

In the Hybrid/PBX mode, a System Access Ring button can be used to make and receive inside and outside calls. in the Key and Behind Switch modes, an intercom Ring button can be used to make inside tails only and to receive inside calls and outside calls transferred by another user.

When an Intercom or System Access Ring button is used to make an inside tail, a ringing frequency is sent to the destination extension number. The person being tailed hears one ring to indicate an inside call.

In the Hybrid/PBX mode, when a System Access Ring button is used to make an outside call, the user selects an outside trunk by dialing either the code for ARS or the pool dial-out code.

in the Key mode, an intercom Ring button can be used to select a personal line. The user dials the idle Line Preference code (usually 9) to select an idle line (the user cannot select a specific line/trunk).

An Intercom or System Access Ring button is automatically assigned to all telephones and Multi-Function Modules (MFMs) connected to the system.

Intercom or System Access Voice Button

In the Hybrid/PBX mode, a System Access Voice button can be used to make and receive inside and outside calls. In the Key and Behind Switch modes, an Intercom Voice button can be used to make inside calls only and to receive inside calls and outside calls transferred by another user.

When an Intercom or System Access Voice button is used to make an inside call, the person being called hears the caller's voice instead of hearing the telephone ring, unless the person being called does not have a speakerphone or has disabled voice announcements.

In the Hybrid/PBX mode, when a System Access Voice button is used to make an outside call, the user selects an outside trunk by dialing either the code for ARS or the pool dial-out code.

In the Key mode, an Intercom Voice button can be used to select a personal line. The user dials the Idle Line Preference code (usually 9) to select an idle line (the user cannot select a specific line/trunk).

An Intercom or System Access Voice button is automatically assigned to all multiline telephones and MFMs connected to the system. An Intercom or System Access Voice button is not factory-set and cannot be assigned via centralized telephone programming to a single-line telephone or other tip/ring device connected to a 012 or 008 OPT module.

Intercom or System Access Originate Only Button

In the Hybrid/PBX mode, a System Access Originate Only button can be used only to make inside and outside calls. In the Key and Behind Switch modes, an Intercom Originate Only button can be used to make inside calls only. Calls are not received on an Intercom or System Access Originate Only button.

The purpose of the Intercom or System Access Originate Only button is to ensure that the user always has a button available to make calls, transfer calls, establish conference calls, answer Call Waiting calls, or pickup parked calls. The button can be programmed for either voice or ring operation for inside calls.

In the Hybrid/PBX mode, when a System Access Originate Only button is used to make an outside call, the user selects an outside trunk by dialing either the code for ARS or the pool dial-out code. The System Access Originate Only button is automatically assigned to all MFMs and multiline telephones connected to the system, except direct-line consoles (DLCs) and QCCs.

In the Key mode, an Intercom Originate Only button can be used to select a personal line. The user dials the Idle Line Preference code (usually 9) to select the line.

Shared System Access Button

A Shared System Access button, available only in the Hybrid/PBX mode, is used to allow two or more users to answer each other's calls, join conversations, or to make or receive inside and outside calls on each other's System Access Voice or System Access Ring buttons.

In a Shared System Access button arrangement, the principal (or primary) station is the telephone from which Shared System Access buttons are assigned. Each Shared System Access button corresponds to a specific System Access Ring or Voice button on the principal station's telephone. The green LED next to a Shared System Access button flashes when a call is received on that specific button and is on steady when the button is in use either at the principal station or on a Shared System Access button.

Shared System Access button assignment is useful when a small group of users—for example, a boss/secretary arrangement or a small group within a system that receives many incoming calls on DID trunks—needs to answer and distribute each other's calls easily or be able to join conversations. To provide complete coverage within the group, each System Access Ring or Voice button assigned to a principal station must be assigned to each member of the group. One System Access Ring or Voice button can be assigned as a Shared System Access button on a maximum of 16 telephones (not including the principal station).

A Shared System Access button is factory-set as a Ring button but can be changed to a Voice button. When a Shared System Access button is set to Ring and is used to make an inside call, the person called hears the telephone ring. When a Shared System Access button is set to Voice and is used to make an inside call, the person called hears the caller's voice instead of the telephone ring.

When a Shared System Access button is used to make an outside call, the user selects an outside trunk by dialing either the code for ARS or the pool dial-out code.

A Shared System Access button can be used to join an in-progress conversation. The maximum number of people that can join a call is two (a maximum of three system users for each call).

Shared System Access buttons can be assigned only in centralized telephone programming. Each multiline telephone can have a maximum of nine Shared System Access buttons, and at least one System Access button must be assigned. A telephone can have only one Shared System Access button for each System Access button on the principal station.

Shared System Access buttons cannot be assigned to single-line telephones or other tip/ring equipment connected to a 012 or 008 OPT module. Shared System Access buttons can be assigned to a tip/ring or external alert device connected to an MLX telephone by an MFM.

Mode Differences

Hybrid/PBX

In the Hybrid/PBX mode, the system assigns one System Access Ring, one System Access Voice, and one System Access Originate Only button to all multiline telephones (excluding system operator positions) and to MFMs. For DLCs, the system assigns one System Access Ring and one System Access Voice button. For equipment connected to a 012 or 008 OPT module, the system assigns two System Access Ring buttons. System Access buttons are not assigned to a QCC.

Shared System Access buttons can be assigned only in the Hybrid/PBX mode.

Key and Behind Switch

In the Key and Behind Switch modes, the system assigns one Intercom Ring and one Intercom Voice button to all multiline telephones (excluding QCCs) and to Multi-Function Modules. For equipment connected to a 012 or 008 OPT module, the system assigns two Intercom Ring buttons.

Shared System Access buttons cannot be assigned in the Key and Behind Switch modes.

Considerations

- In the Key and Behind Stitch modes, outside calls cannot be made on Intercom buttons.

- Intercom and System Access buttons can be assigned or removed only in centralized telephone programming.

- There is no limit to the number of stations that can be programmed as a principal station in a Shared System Access arrangement.

- The maximum number of Intercom or System Access buttons that can be assigned to an individual station is ten. A minimum of one Intercom or System Access button must be assigned to each station.

- The maximum number of Shared System Access buttons that can be assigned to an individual multiline telephone is nine.

- On a multiline telephone, Intercom or System Access (including Shared System Access) buttons are assigned to buttons numbered 1-10.

- Each System Access button on a principal station can be assigned as a Shared System Access button on a maximum of 16 multiline telephones (not including the principal station).

- The maximum number of system users that can be included in a call (including conference calls) is three.

- System Access and Intercom buttons can be set for Immediate Ring, Delayed Ring, or No Ring.

- Shared System Access buttons cannot be assigned in the Key and Behind Switch modes.

■ When a call is received at a specific System Access button on the principal station, it rings on the principal station's System Access button as well as on all Shared System Access buttons programmed for that specific button.

■ In the Hybrid/PBX mode, Shared System Access buttons cannot be assigned to a single-line telephone, and multiline telephones cannot be assigned Shared System Access buttons with a single-line telephone as the principal station unless the single-line telephone is connected to an MFM.

■ An Intercom or System Access Voice button is not factory-set and cannot be assigned via centralized telephone programming to a single-line telephone or other tip/ring device connected to a 012 or 008 OPT module.

■ In the Hybrid/PBX mode, calls received on direct inward dialing (DID) trunks ring on a System Access button and on all Shared System Access buttons for the receiving button that are programmed to ring.

Feature Interactions

Allowed Lists

In the Hybrid/PBX mode, a user with an outward-restricted telephone cannot dial an outside number on a System Access button (including Shared System Access buttons) unless the number is on an Allowed List assigned to the telephone being used. A user with a toll-restricted telephone cannot dial a toll number on a System Access button (including Shared System Access buttons) unless the number is on an Allowed List assigned to the telephone being used.

Auto Answer All

When Auto Answer All is activated, all calls received at an Intercom or System Access Ring, or at an Intercom or System Access Voice button can be answered automatically by the device connected to the GPA. If Shared System Access buttons are assigned, they should be programmed for either Delayed Ring or No Ring and the corresponding System Access button at the principal station should be programmed for Immediate Ring. This prevents calls to the principal station from being answered at the principal station and at stations with the Shared System Access button.

Voice-announced calls received at the analog multiline telephone are not answered by a device connected via a GPA since a ringing current is not sent to the device.

Auto Answer Intercom

When the Auto Answer Intercom feature is activated, the user can answer inside calls by using the Hands Free Unit (HFU). This excludes calls received on a Shared System Access button.

Auto Dial

When an inside Auto Dial button is pressed, the system automatically selects an Intercom or System Access button and turns on the speakerphone. When an outside Auto Dial button is pressed, the system automatically selects an outside line button in the Key mode, a Prime Line button in the Behind Switch mode, or a System Access button in the Hybrid/PBX mode.

Automatic Line Selection

Intercom or System Access (including Shared System Access) buttons can be programmed as part of an Automatic Line Selection sequence. It is not recommended to mix different button types-Personal Line, Pool, Intercom, System Access, or Shared System Access buttons-in an Automatic Line Selection sequence.

Automatic Route Selection

The ARS Facility Restriction Level (FRL) assigned to the telephone being used to make the call applies to calls made on a Shared System Access button.

Callback

Callback can be used on Intercom or System Access buttons. In the Hybrid/PBX mode, when Callback is used on a Shared System Access button, the callback from the system rings and the LED next to the button flashes only at the telephone that originated Callback.

If a user other than the person originating the callback selects a Shared System Access button with a queued call and lifts the handset, the user hears the queuing tone and the green LED on the originator's telephone goes from flashing to on steady. If the user hangs up, the green LED on the originator's telephone goes back to flashing and the system directs the callback call to the originator. If the user does not hang up, the system directs the call to the user and not to the Callback originator.

Calling Restrictions

Calling restrictions assigned to a telephone still apply when calls are made via a Shared System Access button.

Call Waiting

A telephone is considered busy when all Intercom or System Access buttons (excluding Intercom or System Access Originate Only buttons) are in use. The user can dial the Call Waiting feature code to pick up a waiting call only when an Intercom or System Access Originate Only, or a Shared System Access (Hybrid/PBX only) button is available.

Conference

Calls on Intercom or System Access buttons (including Shared System Access buttons) can be included in a conference call. In the Hybrid/PBX mode, if a user involved in a conference call on a System Access button also has a Shared System Access button for one of the conference participants, the call is active at the System Access button and not at the Shared System Access button for the other participant.

Coverage

When a Primary Cover, Secondary Cover, or Group Cover button is programmed, a call received on an Intercom or System Access button that is eligible for Individual or Group Coverage remains on the sender's Intercom or System Access button until it is answered at the receiver's telephone. However, in the Hybrid/PBX mode, calls received on Shared System Access buttons are not eligible for Individual or Group Coverage.

Once answered by a receiver, the call is removed from the sender's Intercom or System Access button (including all Shared System Access buttons). However, when a calling group is programmed as a Group Coverage receiver, the call is removed from the sender's telephone as soon as it is sent from the calling group queue to an available member.

In the Hybrid/PBX mode, if a receiver programs a Primary Cover, Secondary Cover, or Group Cover button programmed for a sender and also has a Shared System Access button associated with the sender, the green LED next to both the Cover button and the Shared System Access button flashes. Additionally, the red LED stays on steady at the Shared System Access button.

Direct-Line Console   Shared System Access buttons cannot be assigned to DLCs.

Disallowed Lists   In the Hybrid/PBX mode, a user cannot use a System Access button (including Shared System Access buttons) to dial an outside number when the number is on a Disallowed List assigned to the telephone.

Display   In the Hybrid/PBX mode, if a user calls an extension and the call is answered at a Shared System Access button, the display shows the principal's extension and not the answering extension.

Do Not Disturb   Do Not Disturb prevents ringing of incoming calls at Intercom or System Access buttons (including Shared System Access buttons) on the telephone where the feature is activated. In the Hybrid/PBX mode, this also prevents calls received on the principal's System Access button from ringing at other telephones with Shared System Access buttons.

Forward and Follow Me   In the Hybrid/PBX mode, calls are forwarded from the telephone that activated Forward or Remote Call Forward. A Shared System Access button cannot be used to activate Forward or Remote Call Forward for the principal's telephone. Calls received on a Shared System Access button are not forwarded.

When calls are forwarded to an extension number, a call received on an Intercom or System Access button rings once at the forwarding station's Intercom or System Access button (including all assigned Shared System Access buttons even though a call received on these buttons is not forwarded) and also rings at the destination station's intercom or System Access button (including all assigned Shared System Access buttons).

Group Calling	Incoming calls to the calling group ring at Intercom or System Access buttons on calling group member telephones. In the Hybrid/PBX mode, a calling group member using a Shared System Access button is considered unavailable. However, the principal station member can still receive calls directed to the calling group since use of a Shared System Access button does not indicate that the principal calling group member is on a call.
	If a person uses a Shared System Access button to join a call with a person waiting in a calling group queue. the call is removed from the queue. Both people and the delay announcement, if programmed, are connected.
Hold	In the Hybrid/PBX mode, a call put on hold either on a System Access or Shared System Access button can be picked up at the principal's System Access button or at any of the Shared System Access buttons programmed for the button with the held call (unless Privacy has been activated). Hold Reminder is heard only by the station that put the call on hold.
Last Number Dial	In the Hybrid/PBX mode, if the Last Number Dial feature is used on a Shared System Access button, the number is stored on the telephone that used Last Number Dial to store the number, and not on the principal station.
Line Request	Line Request cannot be used for an Intercom or System Access button.
Messaging	In the Hybrid/PBX mode, if a user presses a Shared System Access button while leaving a message for a display telephone user, the station extension of the Shared System Access button is shown and not that of the principal station.
	When a principal station user with an MLX display telephone posts a message and a call is answered at the Shared System Access button, the calling information is cleared from the principal station. However, the Home screen on which the posted message is shown is not restored. If the principal station user presses the Home button or makes or receives a call, the Home screen is restored.
Multi-Function Module	It is recommended that one System Access or Intercom Ring button, and one System Access or Intercom Originate Only button be assigned to the MFM. At least one System Access or Intercom button must be assigned to the MFM.
	In the Hybrid/PBX mode, assigning a Shared System Access button for one or more of a principal station's System Access buttons creates a situation where the principal station can pick up calls that have already been answered by the answering machine. There is no way to prevent coverage with this arrangement.

Night Service

In the Hybrid/PBX mode, Night Service calls override any ring options (Delayed Ring or No Ring) programmed for System Access buttons and ring immediately. On Shared System Access buttons, Night Service calls follow the programmed option (Immediate Ring, Delayed Ring, or No Ring).

Paging

Announcements using Speakerphone Paging can be made from a Shared System Access button when a system operates in the Hybrid/PBX mode. However, users cannot join a page (as they can other calls) on Shared System Access buttons.

Park

When a user parks a call made or received on a System Access button, Shared System Access buttons do not ring when the parked call returns.

Personal Lines

When a call on a Personal Line button is transferred to another user, the call rings on an Intercom or System Access button. The LED next to the Personal Line button flashes (fast) to indicate that the call is on hold for transfer. If the call is answered at an Intercom or System Access button, the LED next to the Personal Line button goes on steady. If the user shares the personal line appearance and answers the call by using the Personal Line button, the call is removed from the Intercom or System Access button.

Pickup

If the Pickup feature is used to answer a call ringing at a System Access or Shared System Access button, the call is removed from the ringing telephone and moves to the System Access or Shared System Access button used to pick up the call. The green LED goes on next to the Intercom or System Access button used to answer the call and next to all Shared System Access buttons programmed for that specific button.

Privacy

In the Hybrid/PBX mode, if Privacy is activated on the principal station for a System Access button or by another user with a Shared System Access button, other users, including the principal station, cannot join the conversation. If Privacy is activated after another user joins the conversation, it does not affect that person, but no other users can join the conversation.

Queued Cell Console

System Access buttons are not assigned on a QCC. The QCC system operator uses Call buttons to make and receive inside and outside calls.

Recall

Recall can be used on ringing (unanswered) inside calls when the call is made on an Intercom or System Access button. it cannot be used on an Intercom or System Access button when the user reaches a busy extension.

Reminder Service

A Reminder Service call overrides programmed ringing options (Delayed Ring and No Ring) and rings at the principal station. Reminder Service calls do not ring at Shared System Access buttons.

Ringing Options

Intercom (Ring and Voice) and System Access (Ring, Voice and Shared) buttons can be programmed for Immediate Ring, Delayed Ring, or No Ring. Ringing options cannot be programmed for Intercom or System Access Originate Only buttons since calls are not received on these buttons. The user hears an abbreviated ring when a call is received on Intercom buttons and System Access buttons that are programmed to ring when the user is already on a call.

Multiline telephone users can program a personalized ring for Intercom and System Access buttons. Incoming calls on Shared System Access buttons ring with the personalized pattern assigned to the principal station.

The principal station user in a shared System Access arrangement can activate Send Ring, which causes any Shared System Access buttons on other telephones programmed with Delay Ring to ring immediately when the principal station user is on the telephone. The feature can be activated or canceled by the principal station user.

Saved Number Dial

In the Hybrid/PBX mode, when Saved Number Dial is used on a call made via a Shared System Access button, the number is stored on the telephone using Saved Number Dial and not on the principal station.

Station Message Detail Recording

In the Hybrid/PBX mode, when a call is made by using a Shared System Access button, the SMDR report records the extension from which the call was made and not the principal station extension number.

Transfer

Transferred calls always arrive on Intercom or System Access buttons. When a transfer is initiated, the system automatically selects either an Intercom or System Access Ring, or an Intercom or System Access Voice button. If no intercom or System Access buttons are available, the caller is put on hold for transfer and no line is selected (the user is "high and dry"). The user can select an Intercom or System Access Originate Only button or a Shared System Access button (Hybrid/PBX only), wait for a free Intercom or System Access button, or select an outside line button to transfer a call to an outside number.

In the Hybrid/PBX mode, a transferred call that returns to the principal station does not ring on any of the Shared System Access buttons programmed for the button on which the call is returning. If a transfer originator has a Shared System Access button for the person receiving the transfer, the LED next to the Shared System Access button flashes to indicate a ringing call. However, the call is disconnected if the transfer originator answers the call.

System Numbering

Description

System Numbering is described in detail in the System Planning Guide.

System Numbering is the process of assigning extension numbers to telephones, adjuncts, calling groups, paging groups, park zones, and Remote Access. When the system is turned on, it identifies the type of module installed in each slot in the control unit and automatically assigns extension numbers to the components in exactly the same order that they are connected to the control unit.

The stations are assigned 2-digit extension numbers starting with extension 10. If a user needs a specific extension number, it is simpler to connect the user's telephone to the station jack that is already assigned the requested extension number than it is to change the user's extension number.

Both the number of digits and the extension numbers assigned by the system can be changed to individually address a company's needs. For example, extension numbers can match room numbers.

Any time extension numbers are reassigned, the following must be considered:

■ Extension numbers can contain digits 0 through 9 in any combination, except that no code can begin with 0. (0 is a fixed dial code representing the primary system operator or QCC queue.)

■ Extension numbers can contain one to four digits and must be unique. If you assign an extension number with one or two digits, you cannot use those digits as the leading digits for a longer extension number. For example, if extension numbers 1, 2, 30, and 40 are assigned to telephones, those numbers cannot be used as the first number in longer extension numbers such as 10, 200, 302, or 4052.

■ Any time an extension number is reassigned, the original extension number is available for use.

■ To use any of the reserved system-assigned extension numbers, (shown in the shaded areas of the figures on the following pages) they must first be replaced before they can be used for anything else.

The system offers three numbering plans:

■ Two-Digit

■ Three-Digit

■ Set Up Space

Each of the plans allows renumbering of all or selected extensions.

Two-Digit Numbering Plan

The Two-Digit numbering plan is the factory setting. This plan is designed for
systems with fewer than 50 stations at businesses that do not anticipate a need
for more than 50 stations in the next one or two years.

Figure 2-19 shows the numbers automatically assigned by the system.

Figure 2-19   Two-Digit Numbering Plan

A = 800 - Listed Directory Number (QCC Queue)
B = 889 - Remove Access

The numbers in the figure are arranged in blocks according to the first digit. The
type of equipment, jack, or feature to which they are assigned is indicated in the
block.

Each of the first 58 station jacks is assigned a 2-digit extension number
beginning with 10 and ending with 67. The rest of the stations (68-144) are
assigned 4-digit extension numbers 6800-6885. Extra adjuncts are assigned as
extensions 6900-6985.

The extension numbers shown for MFMs/7500B Data Modules (710-767) are reserved for digital station jacks. These numbers are automatically assigned by the system to ISDN 7500B Data Modules or to adjuncts (such as a data terminal, answering machine, or fax) connected to an MLX telephone using a Multi-Function Module (MFM). For the first 58 digital station jacks, the extension number assigned to the adjunct is the extension number assigned to the MLX telephone preceded by a 7. For example, if the extension assigned to an MLX telephone is 25, the extension for the adjunct on that telephone is 725. In this example, a call can be made to the telephone by dialing 25 or to the adjunct by dialing 725.

Note: The extension numbers are reserved whether or not an adjunct is connected. to an MLX telephone. If you reassign the extension number of the telephone, the system does not automatically change the extension of the MFM or data module.

Three-Digit Numbering Plan

The Three-Digit numbering plan is designed for businesses with more than 50 stations. Figure 2-20 shows the numbers automatically assigned by the system when you renumber the system with this plan.

0	Operator Console (not flexible) 0
1	Stations 100—199
2	Stations 200—243
3	MFMs / 7500Bs 300—399
4	MFMs / 7500Bs 400—443
5	
6	
7	Main Pool 70 · Calling Group 770—791, 7920—7929 · Page 793—799
8	A · Lines 801—880 · Park 881—888 · B · Pools 890—899
9	ARS Access (Hybrid / PBX Mode) / Idle Line Access 9

Figure 2-20   Three-Digit Numbering Plan

A = 800 - Listed Directory Number (QCC Queue)
B = 889 - Remote Access

All stations are assigned a three-digit extension number beginning with 100 and ending with 243.

The extension numbers shown for MFMs/7500Bs (300-443) are reserved for digital station jacks. These numbers are automatically assigned by the system to adjuncts (such as a data terminal, answering machine, or fax) connected to an MLX telephone using an MFM or ISDN 7500B Data Module. The extension number assigned to the adjunct is the extension number assigned to the MLX telephone increased by 200. For example, if the extension assigned for an MLX telephone is 125, the extension for the adjunct on that telephone is 325. In this example, a call can be made to the telephone by dialing 125, or to the adjunct by dialing 325.

Set Up Space Numbering Plan

The Set Up Space numbering plan is designed for businesses that want to customize their system numbering plan and assign 1- to 4-digit extension numbers that are more meaningful for the business and/or more convenient for users. As an example, hotels and motels may want to renumber extensions to match room numbers, and to renumber extensions for services (such as Housekeeping or Room Service) to more convenient 1-digit extension numbers.

Figure 2-21 shows the numbers automatically assigned when the system is renumbered by using the Set Up Space numbering plan.

Figure 2-21   Set Up Space Numbering Plan

A = 800 - Listed Directory Number (QCC Queue)

B = 889 - Remote Access

As shown in Figure 2-21, the system reassigns extension numbers in the 7000 range for all stations. This makes numbers beginning with 1 through 6 available for use in reassigning extension numbers. These new extensions can be from one to four digits long.

The extension numbers shown for MFMs/7500Bs (7300-7443) are reserved for digital station jacks. These numbers are automatically assigned by the system to adjuncts (such as a data terminal, answering machine, or fax) connected to an MLX telephone using an MFM or ISDN 7500B Data Module. The actual extension number assigned to the adjunct is the extension number assigned to the MLX telephone increased by 200. For example, if the extension for an MLX telephone is 7125, the extension for the adjunct on that telephone is 7325. In this example, a call can be made to the telephone by dialing 7125 or to the adjunct by dialing 7325.

Mode Differences

In the Hybrid/PBX mode, an extension is assigned to the Listed Directory Number (the published main number) for the QCC queue. The factory setting is 800.

Considerations

- Extensions do not need to be renumbered in the following cases:

  - The preset two-digit extensions are acceptable.

  - There are fewer than 50 stations in your system.

  - No special extension numbers are needed.

- Any extension number except 0 (system operator) can be renumbered. Line/trunk numbers (801-880) are not extensions and cannot be renumbered.

- Extension numbers can contain the digits 0 through 9 in any combination, except that no code can begin with 0. (0 is a fixed dial code representing the primary system operator or QCC queue.)

- Extension numbers can contain one to four digits and must be unique. If an extension number is assigned with one or two digits, those digits cannot be used as the leading digits for a longer extension number. For example, if extension numbers 1, 2, 30, and 40 are assigned to telephones, those numbers cannot be used as the first number in longer extension numbers, such as 10, 200, 302, or 4052.

- Any time an extension number is reassigned, the original extension number is available for use. However, the corresponding station must be assigned a new extension number before the original extension number can be used for anything else.

- A limited number of extensions can be changed through programming without altering the overall two-digit numbering scheme.

- The System Renumber option is used to assign the beginning extension for the range of 50 or 100 extension numbers assigned to Page buttons on the DSS. The factory setting is that Page 1 begins with extension 0, Page 2 begins with extension 50, and Page 3 begins with extension 100. Each Page button can be programmed to begin with any extension number that is a multiple of 50 within the range of 0-9950.

Feature Interactions

Automatic Route Selection	In the Hybrid/PBX mode, the ARS access code (factory setting is 9) can be renumbered.
Direct Station Selector	The beginning extension for the range of 50 or 100 extensions represented by each Page button is assigned by using the System Renumber option from the System Programming menu. The factory setting is that Page 1 begins with extension 0, Page 2 begins with extension 50, and Page 3 begins with extension 100.
Group Calling, Paging, Park, Pools, and Queued Call Console	Extensions for the following can be renumbered: calling groups (the factory-set extensions are 770-791 and 7920-7929), paging groups (the factory-set extensions are 793-799), system operator park zones (the factory-set zones are 881-888), pool dial-out codes (the factory-set codes are 70 and 890-899), and the Listed Directory Number (extension for the QCC queue; the factory-set extension is 800).
Remote Access	If the system includes DID or dial-in tie trunks, the number assigned to the trunk can be programmed to reach the Remote Access code. This allows Remote Access users to call in on the DID or dial-in trunk. The Remote Access code can be renumbered. The factory-set Remote Access code is 889.
Ringing Line Preference	In the Key and Behind Switch modes, the Idle Line Preference code (the factory setting is 9) can be renumbered.

System Programming

- Change the 2-Digit numbering plan to 3-Digit or Set Up Space.

```
SysRenumber -> Default Numbering
```

- Renumber individual or groups of stations, calling group extensions, Group Page extension, pool dial-out codes, system operator park zones, the Listed Directory Number extension, the Remote Access code, or the ARS access code, or assign the range of extensions on a DSS.

```
SysRenumber -> Single or Block
```

Toll Type

Description

Toll Type allows the system to classify calls as either local or toll, based on the number a user dials. The factory setting for Toll Type dials a toll prefix (1 or 0) before dialing the area code and telephone number for a toll call. In some areas, a toll prefix is not necessary. The factory setting for Toll Type can be changed to specify that no toll prefix is required for these types of lines/trunks.

Dialing a prefix depends on local telephone company requirements and the type of line/trunk being used. The local telephone company must be consulted to determine which lines/trunks require a toll prefix.

Mode Differences

Hybrid/PBX

Systems that operate in the Hybrid/PBX mode and have Automatic Route Selection (ARS) always require dialing a 1 before dialing a 10-digit toll call. Some 7-digit numbers may require dialing a 1 as well.

Considerations

■ Toll Type does not apply to tie trunks or DID trunks.

■ The local telephone company should be contacted to find out which of the system's trunks require a toll prefix.

Feature Interactions

Automatic Route Selection

In certain areas the local telephone company requires dialing the prefix 1 for certain exchanges. In these cases, the exchanges can be assigned to a 1 + 7 ARS table, and the 1 + 7 Dial setting must be set to "Within area code" so that users calling numbers in the exchanges do not have to dial a 1.

Disallowed Lists

When lines/trunks with difierent toll types are connected (for example, basic lines/trunks and PRI facilities), a toll prefix (0 or 1) must be dialed for toll calls on some lines/trunks but not on other lines/trunks. In this case, two Disallowed List entries are required to restrict users from dialing specific area codes and/or telephone numbers. For example, to restrict users from dialing calls in the 505 area code on both toll types, one entry must be "1505" and the other entry must be "505." When the Diallowed List is assigned to a station, the "1505" entry restricts users from making calls to the 505 area code on lines/trunks that do not require a toll prefix and the "505" entry restricts users from making calls (including local calls) to the 505 area code on lines/trunks that do require a toll prefix.

System Programming

● Designate Toll Type requirements, whether or not a toll prefix is required.

```
LinesTrunks -> Tool Type
```

Touch-Tone or Rotary Signaling

Description

Touch-tone tip/ring equipment, such as single-line telephones or fax machines, are equipped with a dialpad that generates dual tone multifrequency (DTMF) signals when a dial button is pressed. Analog multiline and MLX telephones are equipped with dialpads that generate digitally coded signals when a dial button is pressed. The duration of the signal sent is 50 milliseconds (ms) and is not adjustable.

When calls are made from tip/ring equipment or when the Remote Access feature is used, a touch-tone receiver (TTR) is required. TTRs are provided on 400, 400 GS/LS/TTR, 800 DID, 008 OPT, and 012 modules. Normally, these TTRs are sufficient to handle the calls originated from these modules. However, additional TTRs may be needed to support the following services:

■ Tie trunks and DS1 emulated tie trunks set for DTMF signaling

■ Remote Access

■ Account Code Entry

■ AUDIX Voice Power-IS II (AVP) or Integrated Voice Power Automated Attendant (AA)-IS II applications

If more TTRs are needed to support these services, 400 GS/LS/TTR modules can be added (each module provides four TTRs). Table 2-15 shows the estimated number of TTRs needed, depending on the call volume and the type of service.

Table 2-15   Number of TTRs Required

| Calls/hr | Total Number of TTRs Required* | | |
	No Account Codes or Applications	Account Codes or AVP/AA (or equiv)	Account Codes and AVP/AA (or equiv)
110	2	4	6
180	4	6	8
350	4	8	10
420	6	8	10
610	6	10	12
710	8	10	14

* System is considered to already have basic telephones, Remote Access, and tie trunks.

The TTR is allocated for 15 seconds at the beginning of the call. Each time the user presses another digit, the TTR timer is reset for another 15 seconds. If the user does not dial a digit within the 15-Second time frame, the TTR is removed from the call and, after about 24 seconds, the call is disconnected and the user hears a recording or a fast busy.

The system is factory-set to generate touch-tone signals for all lines/trunks when users dial outside calls. The factory setting can be changed for individual rotary lines/trunks so that touch-tone signals are converted to rotary pulses for transmission to the central office.

Telephone Differences

Single-Line Telephones

Touch-tone single-line telephone users cannot make calls by using lines/trunks programmed for rotary operation. The touch-tone signals generated from the telephone are transmitted to the central office at the same time the rotary-dial signals are sent by the system. The central office receives both signals and cannot process the call.

Mode Differences

In the Hybrid/PBX mode, the factory setting for DID trunks is rotary dial. Since DID trunks are used only for incoming calls, the setting need not be changed.

Considerations

■ Tie trunks are set up either to send signals to or receive signals from another PBX, or they are setup to be bi-directional—to send and receive signals. If the system has bi-directional tie trunks, the signaling can be set for both directions independently—for example, outgoing signaling can be rotary and incoming can be touch-tone. The local telephone company should be consulted for more information.

■ The audible feedback for touch-tones generated when a user presses a dialpad button can be heard by any user who shares a Personal Line or a Shared System Access button (Hybrid/PBX only) with the telephone that is used to make a call. Therefore, when dialing confidential numbers such as passwords or account information, the user should take precautions, such as activating Privacy, to prevent others from hearing the touch-tones.

■ The touch-tone duration for multiline telephone touch-tone signals is 50 ms and is not adjustable. If the user needs a longer duration when calling an answering machine, dictation machine, or computer, it is recommended that the user hold the dialpad button down longer.

Feature Interactions

Calling Restrictions   If a tip/ring equipment-user waits 15 seconds after hearing an outside dial tone, the TTR is removed from the call. Once the TTR is removed, the user has approximately nine seconds before the local telephone company disconnects the call, and can override calling restrictions and dial undetected by the system.

System Programming

■ Change each individual line/trunk to rotary or touch-tone service.

```
LinesTrunks -> TT/LS Disc -> OutMode
```

■ Change each individual tie trunk to rotary or touch-tone service.

```
LinesTrunks -> TIE Lines -> Inmode or Outmode
```

Transfer

Description

Transfer allows a user to direct an inside or outside call to another extension (including extensions assigned as a fax port) or to an outside number. Transfering outside calls to outside numbers is called "Trunk-to-Trunk Transfer."

There are three types of transfer

■ **Consultation Transfer.** A user transfers a call to another person and stays on the line until the person answers, then completes the transfer.

■ **Voice-announced Transfer.** A user selects an Intercom Voice or System Access Voice button and makes the transfer to another person. The call is announced and the transfer is completed.

■ **Transfer Without Consultation** A user transfers a call to another person and completes the transfer before the other person answers.

All three types of transfer are possible with multiline telephones; however, single-line telephone users cannot make a voice-announced transfer. In addition, a voice-announced transfer cannot be made to an outside number from any type of telephone.

See "Queued Call Console" in this chapter for details on how QCC system operators transfer ("extend") calls.

Note: Queued call console (QCC) system operators use the Start and Release buttons to transfer calls and do not normally use the Transfer process described in this section.

The following Transfer options are available for more efficient call handling:

■ **One-Touch Transfer.** Calls are transferred to another extension by simply pressing a programmed Auto Dial or DSS button for the extension. The system can be programmed with either automatic or manual completion. With automatic completion, transfers are completed automatically as soon as the Auto Dial or DSS button is pressed. With manual completion, the user must either press the Transfer button again, press another line button, or hang up to complete the transfer.

If One-Touch Transfer with automatic completion is programmed, a user can press the Transfer button before pressing the Auto Dial or DSS button. The user can then consult or announce the transfer and complete the transfer manually.

One-Touch Transfer with automatic completion is the factory setting in the Key and Hybrid/PBX modes and cannot be programmed in the Behind Switch mode.

Note: When One-Touch Transfer is used for calls transferred to telephones outside the system, manual completion is always used regardless of how the system is programmed.

■ **One-Touch Hold.** When the Transfer button is pressed to initiate a transfer, the outside caller is put on hold. The person transferring the call dials the extension number or presses an Auto Dial or DSS button, and then either presses Transfer again, selects another line button, or hangs up to complete the transfer.

One-Touch Hold is the factory setting in the Behind Switch mode only.

■ **Type of Transfer.** The system can be programmed to automatically select either an Intercom Ring or System Access Ring button, or an Intercom Voice or System Access Voice button when a transfer is initiated. In the Key and Behind Switch modes, type of transfer does not apply to calls transferred to telephones outside the system.

If the system is set to select a Ring button and one is available, the call rings at the telephone of the person receiving the transferred call. If the system is set to select a Voice button and one is available, the person receiving the transferred call hears a voice announcement, unless the person does not have a speakerphone, has disabled voice announce, or is on a voice-announced call.

If the specified type of button is not available, the system automatically selects the next available Intercom or System Access button. If no Intercom or System Access buttons are available, the caller is put on hold for transfer and no line is selected (the user is "high and dry"). The user can then select an Intercom or System Access Originate Only button or a Shared System Access button (Hybrid/PBX only), can wait for a free Intercom or System Access button, or can select an outside line button to transfer a call to an outside number.

■ **Transfer Audible.** When outside callers are transferred, they can hear ringback or Music-on-Hold (the factory setting), if available. Inside callers always hear ringback.

■ **Transfer Return Interval.** Transferred calls are returned to the transfer originator after a programmed number of rings (1-9 rings; the factory setting is 4). The Transfer Return Interval can also be set to 0 if transferred calls are not to return to the originator. In this case, calls continue to ring until the call is answered or the caller hangs up. Timing on the Transfer Return Interval begins when the transfer is completed. If the transfer fails for any reason (such as an invalid destination), the Transfer Return Interval is automatically set to 2 rings to allow a faster return.

Note: When a call is transferred to an extension programmed as a fax port, the call is not returned to the originator and continues to ring at the fax extension. This eliminates the possibility that a high-pitched fax tone would be heard by the person who answers the transferred call.

Telephone Differences

Multiline Telephones

To make a consultation transfer, the multiline telephone user presses the Transfer button, or if the system is programmed with One-Touch Transfer with manual completion, the user just presses an Auto Dial or DSS button. In either case, the call is automatically put on hold and the system selects either a System Access or Intercom Voice button, or System Access or Intercom Ring button. If the user wants to transfer the call to an outside number in a system that operates in the Key mode, the user selects an outside line and dials the number. If the transfer can be made, the user completes the transfer process by either hanging up, or pressing another line button, or pressing the Transfer button again. If the transfer cannot be made, the user returns to the caller by pressing the line button associated with the call.

To make a voice-announced transfer, the multiline user presses the Transfer button. The call is automatically put on hold and the system selects either a System Access or Intercom Voice button, or System Access or Intercom Ring button. The user then selects a System Access Voice or Intercom Voice button if the system selected a Ring button, and then dials the extension. If the transfer can be made, the user completes the transfer process by either hanging up, pressing another line button, or pressing the Transfer button again. Voice-announced transfers cannot be made to outside numbers.

To make a transfer without consultation, the user presses the Transfer button and dials the extension, and then either hangs up, selects another line button, or presses the Transfer button again. if the system is programmed with One-Touch Transfer with manual completion, the user presses the Auto Dial or DSS button and then either hangs up, presses another line button, or presses the Transfer button again. If the system is programmed with One-Touch Transfer with automatic completion, the user presses the Auto Dial or DSS button and the call is automatically transferred.

Single-Line Telephones

To make a consultation transfer, the single-line telephone user presses and releases the Recall button or switchhook. The call is put on hold. The user then dials the extension or outside number. After consultation, the user hangs up and the call is transferred. If the transfer cannot be made, the user presses and releases the Recall button or switchhook to return to the caller.

To make a transfer without consultation, the single-line telephone user presses and releases the Recall button or switchhook, dials the extension or outside number, and hangs up. The call is transferred.

Note: If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK—PEC3178-NHL and 2500MMGK-PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the switchhook to transfer a call.

A single-line telephone user cannot make a voice-announced transfer and cannot transfer outside callers to outside numbers.

Mode Differences

One-Touch Hold is the factory setting in the Behind Switch mode. One-Touch Transfer cannot be programmed in the Behind Switch mode. The selection of the option is not blocked in system programming; however, the setting is always One-Touch Hold regardless of which option is chosen.

The other options do not apply to systems that operate in Behind Switch mode. The Transfer feature of the host switch is used instead of the system's Transfer feature. When users press a Transfer button, a timed flash is sent to the host system followed by a programmed access code for the feature. The host system's Transfer access code must be programmed to ensure proper operation.

Considerations

- The One-Touch Transfer option does not apply to single-line telephones.
- A returning transferred call continues to ring on the telephone it was transferred to and on the telephone that originated the transfer until either user answers or the caller hangs up.
- If the system is programmed for One-Touch Transfer with automatic completion, transferred calls always ring; voice announcements cannot be made.
- Transferred calls always arrive on Intercom or System Access buttons or, when transferred to a QCC system operator, on a Call button.
- If a user receiving a voice-announced transferred call selects the personal line on which the call was originally received instead of the Intercom or System Access button, the caller is either dropped or returned to the transferring extension when the Transfer Return Interval expires.
- Calls transferred to locations outside the system may vary in transmission quality.
- Calls cannot be transferred to outside numbers on loop-start lines/trunks unless the loop-start line/trunk is set to reliable disconnect. A reliable disconnect indicates that a disconnect signal is sent by the local telephone company to the system shortly after a caller hangs up.
- Transferring calls to outside numbers cannot be blocked on an individual station. However, calling restrictions or Disallowed Lists can be assigned to individual extensions to prevent outward or toll calls.
- When an outside call is transferred to an outside number, two outside lines are used for as long as the call is in progress.
- When calls are transferred to an outside telephone number, the system does not recognize the transfer until a dialing timeout takes place. The user can avoid delays by dialing # after dialing the telephone number.

■ If a single-line telephone with a timed disconnect is used (for example AT&T models 2500YMGK-PEC3178-NHL and 2500MMGK—PEC3101-ETR), pressing the switchhook automatically disconnects the call. With this type of telephone, the Recall button must be used instead of the swltchhook to transfer a call.

■ A single-line telephone user cannot transfer an outside call to an outside number. If the single-line user tries to complete this type of transfer, the caller remains on hold for transfer and the transfer destination is disconnected.

■ If any user tries to complete a transfer to an outside telephone number, the destination outside number is disconnected under the following conditions (the transfer originator does not receive an error tone to indicate that the transfer was denied):

   ■ The outside line used to make the call is a loop-start line with unreliable disconnect.

   ■ Another inside user joined the call and the call is now a conference call (which cannot be transferred).

■ When a call is received on a T1 channel that is programmed to emulate a loopstart line/trunk and then is transferred to an outside telephone number, it is not disconnected and remains on hold if the caller hangs up before the call is answered.

   The following types of calls ring at the telephone they are transferred to, regardless of whether a Voice or Ring button is used:

   ■ Calls that arrive after waiting in a Callback or Call Waiting queue.

   ■ Calls to busy extensions that do not have the Voice Announce to Busy capability.

   ■ Calls to a telephone programmed to prohibit voice announcements.

   ■ Calls to a telephone whose speakerphone is in use.

   ■ Calls to single-line telephones.

   ■ Calls to a calling group.

   ■ Calls to a QCC system operator.

■ If the system is programmed so that outside callers hear Music-on-Hold while they are being transferred, and if the person transferring a call hangs up before announcing it or uses Camp-On, the transfer is considered completed and the outside caller hears ringback instead.

■ A single-line telephone user cannot make a voice-announced transfer.

■ When One-Touch Transfer with automatic completion is programmed and a call is transferred to a busy extension or to an extension using Do Not Disturb, the transfer is completed automatically even though the call cannot be connected. The call does not return to the transfer originator until the Transfer Return Interval expires.

■ Returning transferred calls ring at the originating telephone with a transfer ring (a three-ring pattern). Display telephone users also see the call type (Return) on the display.

■ When a call is transferred to an extension programmed as a fax port, the call is not returned to the originator and continues to ring at the fax extension. This eliminates the possibility that the high-pitched fax tone would be heard by a person who answers the transferred call.

■ If a multiline telephone user presses the Feature button after initiating a transfer, the dialed digits activate a feature (for example, Privacy). After the feature is activated, the user should redial the extension or telephone number to transfer the call.

■ Calls cannot be transferred from a fax. However, inside and outside calls can be transferred to an extension designated as a fax. Calls transferred to a fax are not eligible for transfer return but the call remains on hold at the originating station until the call is answered by the fax.

■ If the Transfer Return Interval (1-9 rings) is exceeded before a transfer is completed, the call rings back at the telephone of the person who is transferring the call.

Feature Interactions

Auto Dial
Users can press inside Auto Dial buttons instead of dialing extension numbers to transfer calls. To use the One-Touch Transfer option, users must program an Auto Dial button for every extension to which they transfer calls. When a system operator transfers a call and it returns unanswered, the green LED next to the Auto Dial button flashes to indicate the extension from which the call is returning. Only system operators receive this indication.

Automatic Line Selection
Automatic Line Selection does not work when the Transfer button is pressed.

Callback
A queued Callback call cannot be transferred, but calls transferred to busy extensions are eligible for Callback. When a user reaches a busy extension while transferring a call, automatic Callback or selective Callback can be used to queue the call before completing the transfer. The caller hears ringback or Music-On-Hold just like any ordinary transfer.

When the extension is available, the call is transferred to the extension automatically. If the extension is not available before the Transfer Return Interval expires, the call is removed from the Callback queue and returned to the originator.

If a single-line telephone user with a call queued for a busy station completes a transfer to a busy pool, the caller hears a fast busy tone. The transfer is considered complete, and the call is not returned to the originator.

Call Waiting
If a transfer is completed to a busy telephone, the destination hears the Call Waiting tone, if programmed, and the caller hears Call Waiting ringback. The call waits in queue until the Transfer Return Interval expires. Calls answered by using Call Waiting pickup cannot be transferred.

Camp-On	A transfer can be completed by using the Camp-On feature whether or not the destination extension is busy. When the feature is used, the Camp-On Return Interval is used instead of the Transfer Return Interval. The Camp-On Return Interval is normally longer.
	If a user presses the Camp-On button or dials the Camp-On feature code while transferring a call to an outside number, the call to the outside number is disconnected. The original call remains on hold.
Conference	A conference call with three or more participants (including the conference originator) cannot be transferred. However, if the transfer originator has one person on hold for transfer and, after dialing the number, decides to establish a conference call, the transfer originator can press the Conference button; the call is conferenced instead of transferred.
Coverage	Calls transferred to a sender are eligible for Individual and/or Group Coverage. However, if the sender is using Coverage On/Off to prevent calls from going to coverage and does not have an available Intercom or System Access button to receive a transferred call, the sender hears a call waiting tone, even if an Individual or Group Coverage receiver is available.
	Calls answered on a Primary Coverage, Secondary Coverage, or Group Cover button can be transferred, and, when One-Touch Transfer is programmed, they can be transferred by using DSS buttons. Transfer returns are not eligible for Individual or Group Coverage.
Direct-Line Console	A DLC system operator can transfer calls to other users as described in this section.
Direct Station Selector	One-Touch Hold applies only to outside calls on a DLC and not to any calls on a QCC. When One-Touch Hold is programmed, if a system operator presses a DSS button with an inside caller on the line or, in the Hybrid/PBX mode, with an outside caller on a System Access button, the call is not put on hold. A signal is sent to the extension instead.
	When One-Touch Transfer (with either manual or automatic completion) is programmed, if the system operator presses a DSS button while a caller is on the line, and no Intercom or System Access button is available to transfer the call, the call does not go on hold. If the system operator hangs up, the caller is disconnected.
Display	When an MLX display telephone user presses the Transfer button, the display prompts the user to dial the extension number and shows the digits as they are dialed. When all digits are entered, the display shows the name of the person, if labels are programmed.

Calls returning from a transfer are identified by call type and by the name and extension number to which the call was transferred. The second line of the display also shows the caller information.

When an MLX display telephone user receives a transferred call, the display shows the type of call and the caller information on line 1. When an inside call is being transferred, the display shows the extension number or line/trunk number. When an outside call is being transferred, the line the call came in on is shown or the caller's telephone number if ANI is available. The transfer originator is shown on line 2.

When an MLX display telephone user does not complete a transfer (for example, because Do Not Disturb is activated at the destination extension), the call returns to the user's telephone and call information is displayed. The reason for the incomplete transfer is not indicated.

Do Not Disturb

Calls transferred to telephones that have Do Not Disturb activated are returned after the Transfer Return Interval expires, unless the telephone has Coverage and a receiver is available. In that case, the transferred call is redirected to the receivers.

Forced Account Code Entry

When a call is transferred, the destination extension cannot enter an account code or overwrite the account code entered at the originating telephone.

Forward and Follow Me

Transferred inside and outside calls are forwarded. If a user transfers a call to an extension with forward activated, the person receiving the forwarded calls hears one ring, indicating an inside call. And, if the person has a display telephone, he or she seas the call information for inside calls.

Group Calling

A call transferred to a calling group is not returned to the originator; the call is handled just as any other call received in the calling group. For example, the system follows the same hunt sequence to locate an available calling group member and the call is eligible for a delay announcement if one is programmed. A calling group member is considered available for a call while in the process of transferring a call. Voice-announced transfers cannot be made to a calling group. There is no limit to the number of calls that can be transferred to a calling group.

When an inside caller is transferred to a calling group and no members are available, the inside caller hears regular ringback. When an outside caller is transferred to a calling group and no members are available, the outside caller hears regular ringback or Music-on-Hold, if it is programmed.

Headset Options

When an MLX telephone user transfers a call, Headset Auto Answer is deactivated and must be reactivated manually unless the user releases the call by using the Headset Hang Up button.

Hold	Calls on hold for transfer are also timed so that the user or system operator hears a reminder after the timer expires.
	If a call is received on a personal line and is transferred to another user who then puts the call on hold, another user who shares the personal line cannot select the line button to pick up the call. If for some reason the person who received the transfer and put the call on hold cannot return to the call, another user must use the Line Pickup feature to pick up the call (for example, a system operator can take a message and disconnect the caller).
Inspect	If an MLX telephone user presses the Transfer button while Inspect is activated, Inspect is canceled and the user is returned to the Home screen.
Last Number Dial	The Last Number Dial feature can be used to dial the outside number of the telephone to which the call is being transferred.
Line Request	Returning transferred calls cancel Line Request.
Messaging	A non-display user who sends a message by using Leave Message while a transfer is in progress cannot determine who received the message. For example, if station A calls station B, and station B transfers the call to station C, and if station A sends a message before the transfer is complete, station B receives the message. If station A sends a message after station B completes the transfer, station C receives the message, even if station C does not answer and the call is ringing at station B as a transfer return.
	If an inside call is transferred to a telephone with a posted message, only the display telephone user who transfers the call sees the posted message. The original caller does not see the posted message even after the transfer is completed.
	If a call is transferred to an extension programmed as a fax, the message indication is not sent to the fax message-waiting receiver, regardless of the amount of time programmed for the fax message-waiting threshold.
Microphone Disable	Calls can be transferred with a voice announcement to users whose microphones are disabled, but the users must lift the handset to talk.
Multi-Function Module	Calls cannot be transferred on an MFM since the system ignores the switchhook flash.
Music-on-Hold	An outside caller hears Music-on-Hold if programmed for Transfer Audible.
Paging	Calls cannot be transferred to paging groups or the loudspeaker paging extension.

Park	A user can park calls by pressing the Transfer button and dialing his or her own extension or, for DLC system operators, by dialing a system operator park zone. When using this method, the transfer must be completed by pressing the Transfer button or by hanging up. This method cannot be used by QCC system operators.
Pickup	A transferred call can be answered by using the Pickup features.
Queued Call Console	The QCC system operator uses the Start and Release buttons, or a DSS button, to transfer calls. However, pressing the Transfer button on a QCC console is the same as pressing the Start button. A system operator cannot make or receive voice-announced transfers When a QCC system operator uses the Start and Release buttons to transfer a call, the Return Ring Interval applies for transfer return timing instead of the Transfer Return interval.
Recall	The single-line telephone user can use the Recall button to transfer a call if so equipped.
Ringing Options	Transfer returns ring until answered and do not receive Abbreviated Ring.
Saved Number Dial	The Saved Number Dial feature can be used to dial the outside number of the telephone the call is being transferred to.
Signaling	A Signaling button can be used to dial the extension after the Transfer button is pressed. However, Signaling buttons cannot be used to initiate One-Touch Transfer.
Speed Dial	Both Personal and System Speed Dial can be used to dial the number of the telephone to which the call is being transferred.
Station Message Detail Recording	The extension number for the station that hangs upon an incoming outside call is shown in the "Station Extension" field of the SMDR report, regardless of how many times the call is transferred. For outgoing outside calls, the extension number for the station that dialed the call is shown on the SMDR report, even if the call is transferred to another extension.
System Access	Transferred calls always arrive on Intercom or System Access buttons. When a transfer is initiated, the system automatically selects either an Intercom or System Access Ring, or Intercom or System Access Voice button. If no Intercom or System Access buttons are available, the caller is put on hold for transfer and no line is selected (the user is "high and dry"). The user then can select an Intercom or System Access Originate Only button or a Shared System Access button (Hybrid/PBX only), can wait for a free Intercom or System Access button, or can select an outside line button to transfer a call to an outside number.

In the Hybrid/PBX mode, a transferred call that returns to the principal station does not ring on any of the Shared System Access buttons programmed for the button on which the call is returning. If a transfer originator has a Shared System Access button for the person receiving the transfer, the LED next to the Shared System Access button flashes to indicate a ringing call. However, the call is disconnected if the transfer originator answers the call.

System Programming

■ Assign the Transfer Return Internal (0-9 rings, the factory setting is 4).

```
Options -> Transfer -> Return Time
```

■ Assign One-Touch Transfer with either automatic or manual completion or One-Touch Hold. The factory setting is One-Touch Transfer with automatic completion.

```
Options -> Transfer -> One Touch
```

■ Specify either Music-on-Hold or ringback for the Transfer Audible (the factory setting is Music-on-Hold).

```
Options -> Transfer -> Audible
```

■ Select either System Access/Intercom Ring or System Access/Intercom Voice for the Type of Transfer (the factory setting is System Access/Intercom Ring).

```
Options -> Transfer -> Type
```

Related Features

■ Camp-On

Voice Announce to Busy

Extension Programing

```
Programming Codes:
For calls recived:
On:                      *10
Off:                     **10
MLX Display Labels:
On:    Voice Annce, Receive, On [Voice, Recv,On]
Off:        Voice Annce, Receive, Off
                 [Voice, Recv, Off]
```

Description

Voice Announce to Busy allows MLX and analog multiline telephone users to receive inside calls over their speakerphones, even if they are on a call. A multiline telephone user can cancel all voice announcements to the telephone, including voice-announced transfers and group pages. The factory setting for all multiline telephones is that voice announcements can be received.

For MLX telephones, the feature is automatically available. For analog multiline telephones, two consecutive station jacks must be assigned as a voice/voice pair. The extension assigned to the odd-numbered jack is the telephone's extension. The extension assigned to the even-numbered jack cannot be called.

When a user makes a voice-announced call by using a System Access or Intercom Voice button to a telephone with Voice Announce to Busy, the caller hears a tone and the user who is on the telephone hears the caller's voice over the speakerphone unless one of the following conditions exists:

■ The person called is using the speakerphone.

■ The person called has canceled voice-announcements.

■ The person called is using the Do Not Disturb feature.

If any of the above conditions exist, the caller hears ringback and the person being called hears an abbreviated ring, if programmed.

Telephone Differences

Multiline Telephones

Voice Announce to Busy is automatically provided to MLX telephones and does not need to be programmed. Analog multiline telephones require an additional station jack to use this feature.

The voice-announcement capability is not automatically canceled for MLC-5 analog multiline telephones. This type of telephone cannot receive voice-announced calls; therefore, the voice-announce capability must be canceled for MLC-5 telephones to ensure proper operation.

Single-Line Telephones	Single-line telephone users cannot receive voice announcements

Considerations

■ MLX and analog multiline telephone users can program their telephones to prohibit all voice announcements, including Voice Announce to Busy.

■ When a user cancels all voice announcements, the Hands Free Answer On Intercom (HFAI) capability is also not operable.

■ The voice-announcement capability is not automatically canceled for MLC-5 analog multiline telephones. These types of telephones cannot receive voice announced calls; therefore, the voice-announce capability must be canceled for MLC-5 telephones to ensure proper operation.

■ If a multiline telephone user tries to make a voice-announced call to an MLC-5 telephone on which voice-announce capability has not been canceled, the call is dropped, all LEDs on the telephone go out, and the user does not receive an error tone.

Feature Interactions

Do Not Disturb	A user with Do Not Disturb active does not receive voice announcements.
Paging	Users who program their telephones to prevent voice announcements do not receive group pages.
Queued Call Console	Voice announcements are canceled on QCCs and cannot be activated. Voice-announced transfers cannot be made from the QCC.

System Programming

Assign voice/voice pairs for two consecutive station jacks for every analog multiline telephone with this feature.

```
Extensions -> VoiceSignal
```

Related Features

■ Simultaneous Voice and Data (see *Data Guide)*

System Applications

<div style="text-align: right; font-size: 4em;">3</div>

Several integrated and stand-alone applications improve the call-handling and processing capabilities of the MERLIN LEGEND Communications System:

■ Call Accounting System (CAS)

■ Call Accounting Terminal (CAT)

■ Call Management System (CMS)

■ Integrated Solution II (IS II)

■ MERLIN® Attendant

■ MERLIN MAIL™ Voice Messaging System

■ System Programming and Maintenance (SPM)

Table 3-1 shows the capacity of each application and the modes of operation in which it can be used.

In the following pages is a brief discussion of voice messaging systems, followed by a description of each application, organized by the subheadings below. Subheadings that are not applicable are omitted-for example, if there are no mode differences, the "Mode Differences" subheading is omitted. The subheadings are

■ **Description** - how the application works

■ **New Application Features** - features of the application that are new for the MERLIN LEGEND Communications System

■ **Mode Differences** - differences or imitations of the application in the Key, Hybrid/PBX, or Behind Switch modes of operation

■ **Considerations** - restrictions, capacities, and any other information that is to be considered before installing or using the application

■ **Feature Interactions** - system and telephone features that affect how the application works; also included are the features that do not work with the application

■ **System Programming** - an outline of the programming required to set up the application. (See the appropriate planning guide for planning instructions and *System Programming* for system programming instructions. Also see the guides provided with the application itself.)

■ **Hardware Requirements** - additional hardware required to connect the application to the system and, where appropriate, a diagram illustrating the connection

Table 3-1   Applications: System Capacity and Modes of Operation

Application	Capacity	Key	PBX	Behind Switch
CAS	1	✔	✔	✔
CAT	1	✔	✔	✔
CMS	2	✔	✔	
■ Number of lines/trunks (each)	28			
■ Number of agents (each)	28			
■ Number of external alerts (each)	4			
IS II		✔	✔	✔
■ AUDIX Voice Power—IS II	1	✔	✔	
■ Number of mailboxes	300			
■ Integrated Voice Power Automated Attendant	1	✔	✔	
■ CAS–IS II	1	✔	✔	✔
■ SPM–IS II	1	✔	✔	✔
MERLIN Attendant	1	✔	✔	
MERLIN MAIL Voice Messaging System	1 (4 ports)	✔	✔	
■ Number of mailboxes	40			
SPM—MS-DOS*	1	✔	✔	✔

* MS-DOS is a registered trademark of Microsoft Corporation.

Voice Messaging Systems

A voice messaging system (VMS) is not an application but is a category of applications. Each of the following applications is used as a VMS and is connected to an enhanced tip/ring port called a voice messaging interface (VMI) port:

■ MERLIN MAIL Voice Messaging System

■ MERLIN Attendant

■ AUDIX Voice Power—IS II

■ Integrated Voice Power Automated Attendant—IS II

The system provides generic and integrated VMI ports. The MERLIN MAIL Voice Messaging System and AUDIX Voice Power—IS II applications use streams of touch-tone codes (called mode codes) to communicate information.

Applications that use mode codes must be connected to integrated VMI ports. Applications (such as MERLIN Attendant and Integrated Voice Power Automated Attendant—IS II) that do not use mode codes connect to generic VMI ports. The tip/ring ports on 012 basic telephone modules are programmed to be either "generic VMI" or "integrated VMI."

A VMS requires a certain amount of touch-tone receivers (TTRs), depending on the number of VMS ports (see Table 3-2). TTRs are supplied by the following modules: 008 OPT, 012, 400, and 400 GS/LS/TTR. However, the VMS applications are not supported on the 008 OPT module.

Table 3-2 TTRs Required by VMS

No. of VMS Ports	No. of TTRs Required	No. of 012 Modules	No. of 400 or 400 GS/LS/TTR Modules
1	1	1	0
2	1	1	0
3	2	1	0
4	2	1	0
6	3	2 or 1	0 1
8	4	2 or 1	0 1

Table 3-2 Continued

No. of VMS Ports	No. of TTRs Required	No. of 012 Modules	No. of 400 or 400 GS/LS/TTR Modules
12	6	3 or 2	0 1

VMI Capabilities

VMI ports use swtchhook flashes in the same way single-line telephones do for
Hold. Transfer, Conference, and Drop. VMI ports also have the following
capabilities:

■ transfer redirect

■ far-end disconnect

■ VMI ports in/out of service

Transfer Redirect

If unanswered by the end of the transfer redirect time interval (programmable for
0 to 9 rings), a call transferred from a VMI port will alert at the VMS transfer
redirect extension, rather than return to the VMI port that originated the transfer.
In the case of a blind transfer, when the transfer destination is busy or is an
invalid extension, the transfer redirect is immediate (no time interval). If the
transfer redirect station cannot be alerted (all buttons are being used), the VMS
will keep trying to alert the transfer redirect station every 20 seconds until the
alert is delivered or the caller hangs up.

For example, station port 15 is programmed as a VMI port and is connected to a
MERLIN Attendant. A call comes in on port 15, and the caller dials in a request
for extension 2224 (station port 24) at the recorded prompt. The call rings at
station 24 for four rings (the programmed transfer redirect time interval) and is
then redirected to station port 10, the system operator. The call is not redirected
back to port 15.

Far-End Disconnect

When a far-end disconnect signal is detected on an outside line/trunk on which
a call is made or received from a VMI port, the system sends the far-end
disconnect signal to the VMI port, whether or not the VMI port is the only party
left on the call. The VMS decides whether or not to continue the call (if another
party is still on the call). This far-end disconnect occurs only if the loop-start VMI
port is programmed for "reliable" disconnect.

VMI Ports In/out of Service

When a calling group call to a VMI port is not answered within 30 seconds, the call is sent to another available VMI port in the calling group or is queued back to wait for an available port in the calling group.

For an integrated VMI port, the control unit sends mode codes to inform the VMS that the port is out of service. The VMI software marks the unavailable port "out of service," and the calling group software logs it "out of service." If all VMI ports go out of service, a programming logic inconsistency (PLI) is generated.

Every ten minutes the system tests each out-of-service VMI port. If the port responds to the alert, the VMI software marks it "in service," and the calling group software logs it "in service." For integrated VMI ports, the control unit informs the VMS by port-in-service mode codes.

Mode Codes

Mode codes are streams of touch-tone tones that carry information from the control unit to the VMS connected to the integrated VMI port. The two classes of mode codes are Call Information and Other.

- **Call Information mode codes**
  - direct inside access
  - direct dial access-line/trunk
  - call coverage-internal station
  - call coverage-external (line/trunk)
  - call coverage-other
- **Other mode codes**
  - leave word calling
  - refresh message waiting LEDs
  - port restored to service
  - port taken out of service
  - day service
  - night service

Call Accounting System

The AT&T Call Accounting System (CAS) is an ideal solution for medium- and large-sized businesses that want to manage telephone usage and control costs by tracking calls made from and received by the system.

CAS is also available as part of the UNIX-based Integrated Solution II (IS II) software application.

CAS runs on an approved AT&T MS-DOS-based PC. Two versions of this product are offered: CAS-Hospitality (CAS/H) for hotels and health care facilities and CAS Plus—Business for other types of businesses.

The basic CAS application allows businesses to calculate the cost of calls by using the rates charged by AT&T and other carriers in one often major metropolitan areas. Careful selection of the area that most closely matches the company's location and needs assures the most accurate costing available. Rate information can be customized for a telephone exchange at an additional charge.

CAS Plus performs the following functions:

■ **Call Record Processing.** Call records can be screened, the cost of valid calls are calculated, and call records are stored.

■ **Report Generation.** Stored call record information can be printed and organized into various reports, as follows:

　■ Summary Reports provide condensed information such as the number of calls, duration, and cost.

　■ Organization Detail Report provides a list of departmental telephone activity allowing isolation of how specific extensions are being used.

　■ Selection Report allows specification of report criteria so that only those call records that meet the criteria appear on the report.

　■ Account Code Detail Report lists every call associated with each account code entered by users.

　■ Facility and Cost Center Reports show the distribution of line/trunk usage over organizations or cost centers.

　■ Preselected Reports provide a choice of up to five reports from any of the other report categories and can be set to print on demand or at a specified time and date.

■ **System Management.** The system manager can perform several administrative functions, such as editing tables, setting up reports, and keeping call rate information up to date.

■ **Directory Lookup and Message Center.** Callers can lookup anyone in the organization by name or extension, leave a message, and print or display messages.

Other features of CAS Plus include

■ processing of local and short-duration calls or only of calls that exceed a certain cost

■ adding a service charge to calls before billing them to clients, departments, or projects

New Application Features

Features for CAS that are new in the MERLIN LEGEND communications system include displays that have pull-down menus and on-line help.

Considerations

■ Only one CAS can be connected to the telephone system.

■ CAS operates on an approved AT&T PC operating with MS-DOS, Version 3.3 or later. The PC must be dedicated to CAS.

■ CAS collects detailed information on incoming and outgoing calls to and from outside numbers only. It does not collect information on calls between inside extensions.

■ CAS does not provide for the processing of automatic number identification (ANI) information. However, the CAS-IS II does. (See "Integrated Solution II" in this chapter.)

■ CAS handles call records up to 64 bytes; the number of calls depends on the amount of available disk space. In its largest version, CAS records data for up to 5,000 extensions and 15,000 account codes.

System Feature Interactions

Account Code Entry

The account codes users enter before or during calls are used by CAS to associate calls with accounts and individuals; these codes appear on CAS reports.

Station Message Detail Recording

CAS uses the call information provided by the communications system's built-in SMDR feature to process calls.

Note: There are two formats for SMDR: basic and ISDN-PRI.

Hardware Requirements

A typical CAS system consists of the following equipment:

■ An approved AT&T MS-DOS-based PC with the following configuration:

- 640K RAM

- Hard disk drive with at least 3 Mbytes of available space for the application software

- parallel printer output

- serial SMDR input

■ 132- or 80-column parallel printer

■ D8W modular cord and 355AF adapter connecting the SMDR port on the communications system to the COM1 serial port on the PC

■ MS-DOS system disk, version 3.3 or later

■ CAS software (CAS/H, CAS Plus)

The connection of CAS depends upon the distance between the control unit and the PC used for CAS and whether or not the control unit and the PC are plugged into the same AC power branch circuit. Figure 3-1 illustrates the connection when the distance is less than 50 feet and the control unit and the PC are plugged into the same AC circuit. Figure 3-2 shows the connection when the distance is 50 feet or more or when the control unit and the PC are plugged into different AC power branch circuits.
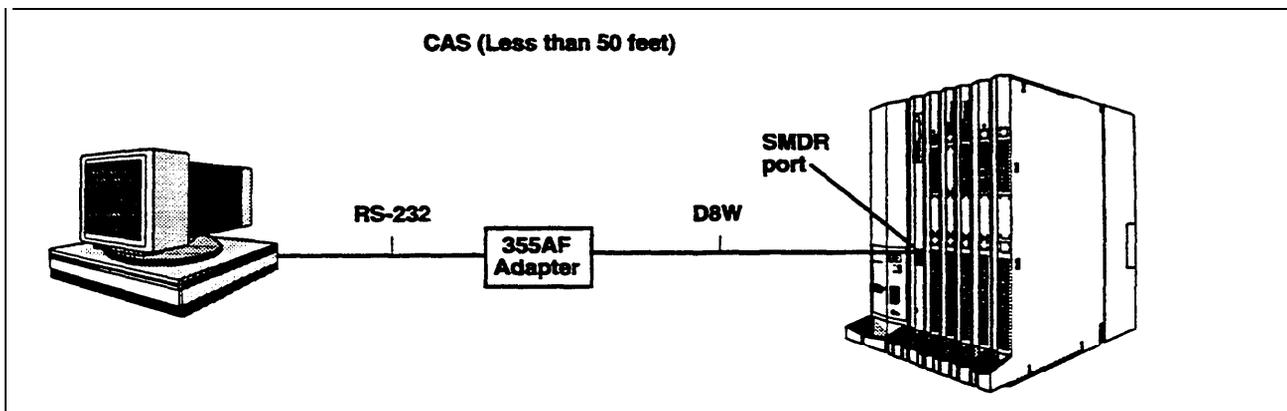
Figure 3-1   CAS Connection Less Than 50 Feet
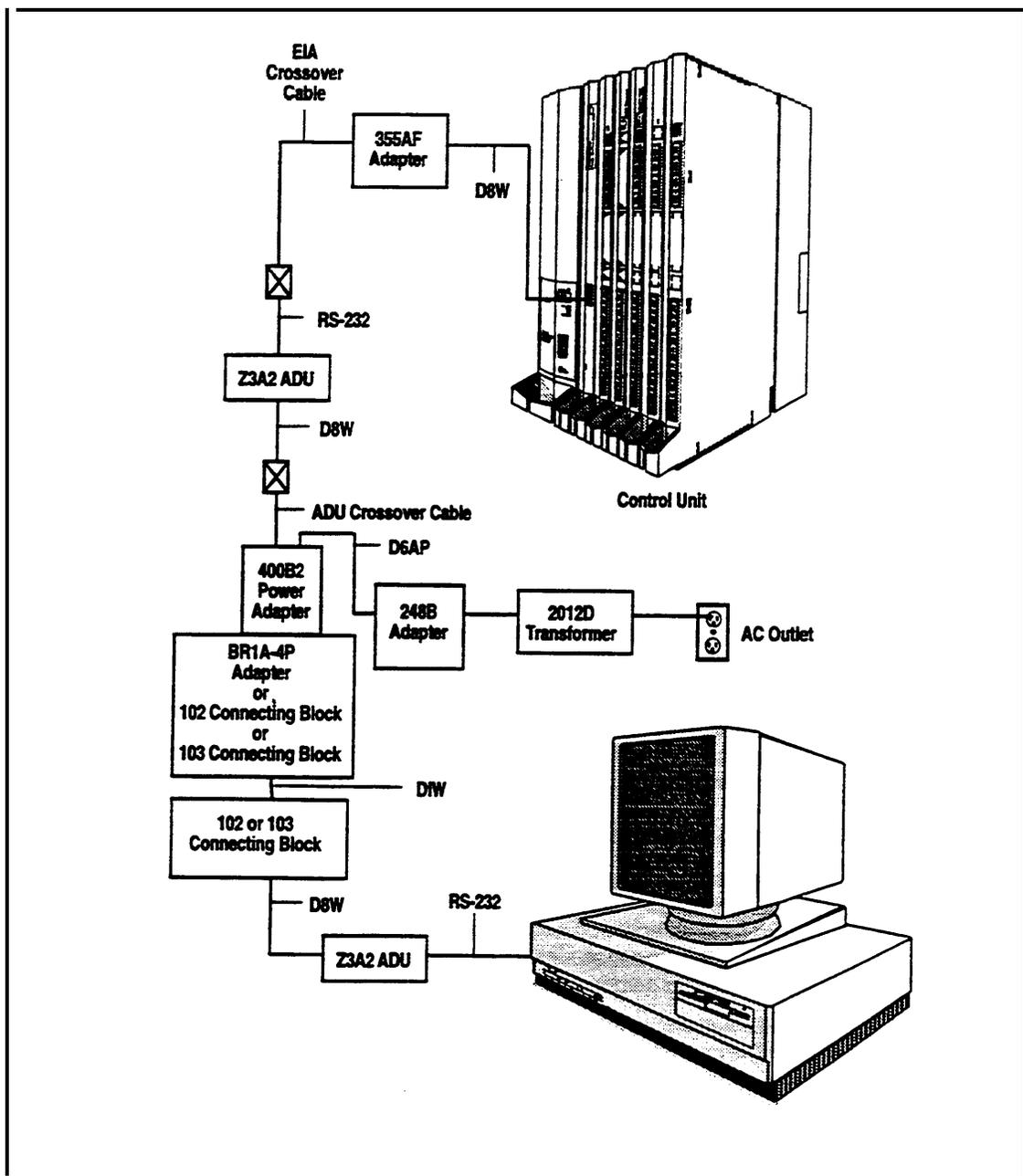
Figure 3-2   CAS Connection 50 Feet or More

Call Accounting Terminal

The Call Accounting Terminal (CAT) is a stand-alone application that provides accurate and flexible call accounting at a low cost. Two versions of this product are offered: CAT—Hospitality for hotels and health care facilities and CAT—Business for other types of businesses. The CAT has built-in intelligence and memory for collecting and organizing call information, including the duration of calls, the area code dialed, and the account charged.

The CAT is customized with the latest local and long-distance rates for a company's location so the cost of calls can be calculated accurately. Telephone rate information is stored in a CAT component called an EPROM (erasable and programmable read-only memory). When telephone rates change or a new area code or exchange is added, the customer simply removes the EPROM and installs a new one.

The CAT provides a variety of reports that can be printed on a regular schedule or automatically when 90 percent of the terminal's memory contains call information. CAT reports include

■ detailed and summary call information for all the extensions in the system or the same information for a single extension. If the business uses account codes to track outside calls, similar reports can be printed for the account codes.

■ management analyses that organize call information by time of day, cost and duration of calls, the area codes and exchanges called, and the facilities used to make calls. These reports provide the information a business needs to make informed decisions and manage telephone costs.

Other features of the CAT are

■ flexible pricing - The CAT can be set up to calculate the cost of calls by using toll rates or charging by the minute. Service charges and discounts can be applied to calls made to local and long-distance numbers and to directory assistance. Calls to certain area codes, such as 900, can also be singled out for special treatment.

■ automatic updates - When new telephone lines or account codes are added to the communications system, the CAT adds this information automatically the first time a new line or code is used.

New Application Features

Features for the CAT that are new in the MERLIN LEGEND Communications System include

■ **LCD display** instead of a printed menu

■ **Automatic number identification (ANI)** for AT&T Megacom® 800 service

Note: The availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or telephone company equipment.

Considerations

- Only one CAT can be connected to the communications system.

- A serial printer such as the AT&T 572 should be used so that the CAT can be connected directly to the SMDR port on the communications system's control unit. A parallel printer cannot be attached directly.

- The CAT is unable to process automatic number identification (ANI) information from the Integrated Services Digital Network (ISDN).

- The CAT can store call information on 5600 calls made from up to 125 telephones that share up to 49 lines. When 5040 of these calls have been processed, reports are printed and memory is cleared. Any calls that come in during this process are held until reports are printed again.

System Programming

- Set SMDR options:

  - Select basic call report format.

  - Specify the minimum call length to be recorded.

  - Specify whether information is to be recorded for both incoming and outgoing calls or only for outgoing calls.

System Feature Interactions

Account Code Entry   The account codes users enter before or during calls are used by the CAT to associate calls with accounts and individuals; these codes appear on CAT reports.

Station Message Detail Recording   The CAT uses the call information provided by the communications system's built-in SMDR feature to process calls.

Note: There are two formats for SMDR: basic and ISDN-PRI.

Hardware Requirements

- Call Accounting Terminal

- Serial printer (model 572 is recommended) connected via a serial cable to the SMDR port of the CAT

- D8W modular cord and 355AF adapter connecting the SMDR port on the communications system to the CAT

Figure 3-3 illustrates the connection of a CAT to the system control unit.
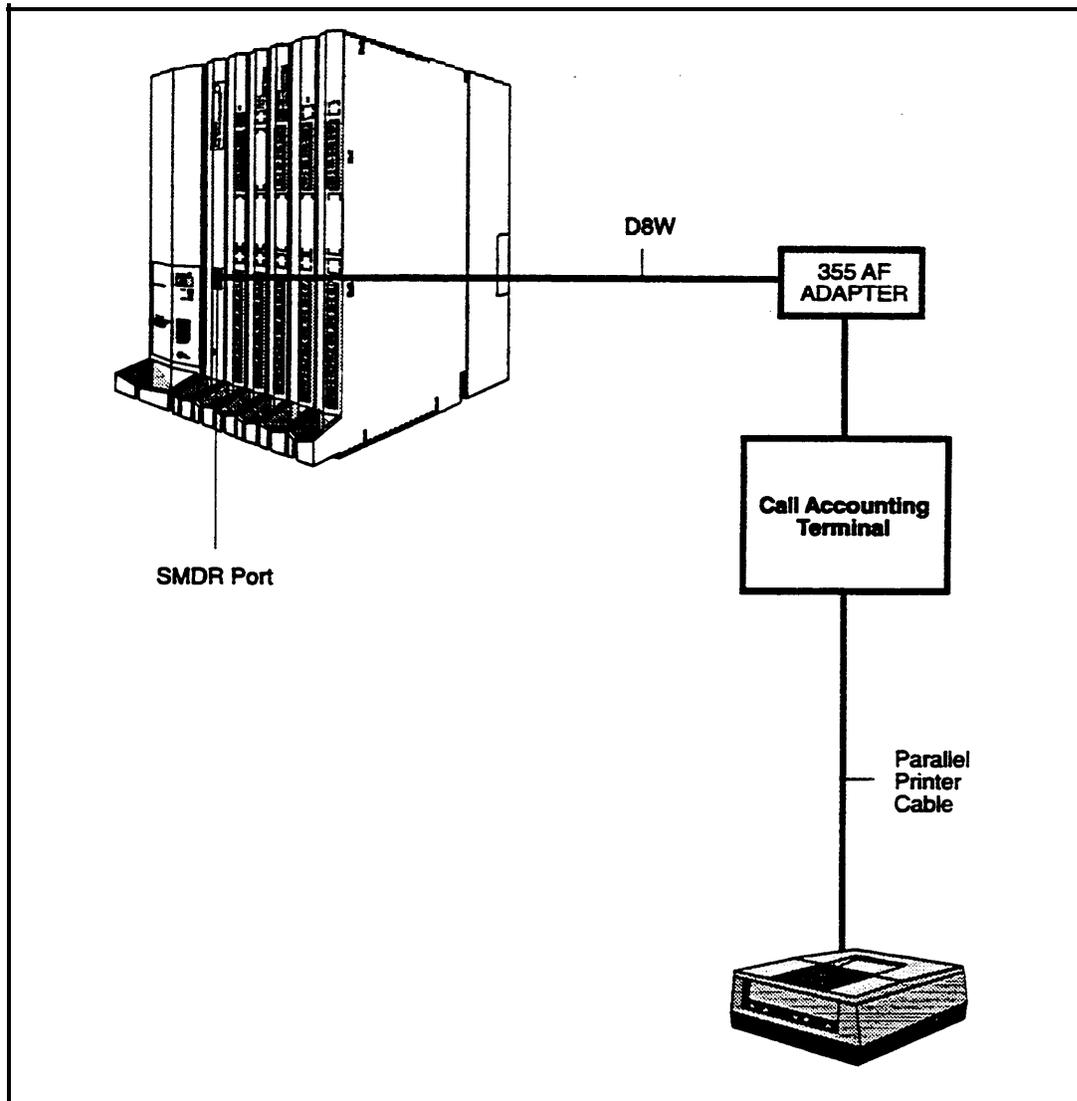
Figure 3-3   CAT Connection

Call Management System

The Call Management System (CMS) is an MS-DOS-based software application that simulates the actions of a system operator by answering calls and distributing them to individual agent telephones. If no agents are available, CMS puts calls on hold and, if programmed, plays a recorded announcement to the callers such as, "Thank you for calling the ABC Company. Please hold for the next available agent." CMS then searches its network for the appropriate agent, usually the one who's been idle the longest, and transfers the call to that person's telephone.

CMS is appropriate for businesses with large groups of personnel who perform a common function, such as airline ticketing, filling catalog orders, and providing customer service. Agents within these groups can be divided into agent splits to handle different types of calls or customers. For example, the agents in a travel agency may be divided into three splits: one that handles personal vacations, one that handles business trips, and one that handles group charters. Another split can be designated to provide support when the call traffic is particularly heavy in the other splits. Calls come into each of the splits on a group of lines designated to ring into the split.

Agents make themselves available and unavailable to take calls by logging in and out. Additionally, agents can enter the After-Call-Work (ACW) state, which allows them to complete work on their last calls without being interrupted by new CMS calls. The system can be setup so that agents are automatically in the ACW state whenever they complete a CMS call or so that agents must dial a feature code or press a programmed button to enter ACW.

Other features of CMS include

- easy-to-use management reports that analyze call volume and patterns, as well as agent activity. Summary reports can span from 1 to 93 days.

- Answer Delay option, which determines how long a call rings before it is designated as unanswered and connects to the recorded announcement

- Forced Delay option, which connects all calls to the recorded delay announcement regardless of whether all agents are busy when the calls come in

- designation of priority lines to ensure that calls coming in on these lines are answered first

- display of current agent activity on system status screens to allow monitoring, tracking, and analyzing of short- and long-term performance

- ability to connect Music-on-Hold to callers waiting for available agents

- connect up to four external alerts to indicate an exception. For example, an LED lights when the oldest call has waited longer than 30 seconds. Exception thresholds are programmed.

- Summary reports can span from 1 to 93 days.

- real-time dynamic reconfiguration, which lets the user modify the call flow on-line

Mode Differences

CMS cannot be connected to a communications system that operates in the Behind Switch mode.

Considerations

- CMS can handle calls for up to 28 agents on up to 28 lines, and it can answer calls on two lines at the same time with the same announcement.

- There can be up to six agent splits with 28 agents per split.

- A maximum of two CMSs can be connected to a communications system to handle a second set of lines if a business requires more than 28 lines or employs more than 28 agents.

- CMS operates on an approved AT&T PC with MS-DOS Version 3.3. The PC must be dedicated to CMS.

- The CMS supervisor's console is the MERLIN II System Display Console. CMS agents can have any MLX telephone or any analog multiline telephone that can be used with the communications system. CMS agent telephones must be connected to the first 58 telephone jacks on the control unit. (CMS allows only a two-digit method to specify an extension number; jacks 59 to 144 are designated by four digits.)

- The two CMS interface card ports on the PC must be connected to two analog multiline telephone jacks on the same analog multiline telephone module; these jacks must be system operator positions. If two system operator position jacks are not available on the same module, another analog multiline telephone module must be installed in the control unit to provide these jacks.

- CMS lines/trunks can be loop-start, ground-start, T1 emulated ground-start, or ISDN-PRI.

- Up to four CMS external alerts can be used to alert agents and supervisors when the number of calls waiting to be answered is equal to or greater than the programmed threshold.

- A MERLIN Attendant can be used to direct callers to the appropriate CMS group.

- To play music for waiting callers, you must attach a Music-on-Hold (MOH) product to the system that is compatible with an AT&T MOH coupler.

  Note: If you use equipment that rebroadcasts music or other copyrighted materials, you may be required to obtain a copyright license from and pay license fees to a third party such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or you can purchase a Magic on Hold system, which does not require that you obtain such a license, from AT&T or your authorized dealer.

System Feature Interactions

Extention Status

A CMS supervisor uses the Extension Status feature to control and monitor when agents are in the available, unavailable, or ACW state. A CMS agent does not have to be a member of a calling group to use the available/unavailable status. The system can be programmed for CMS or for Hotel/Motel Extension Status, but not for both.

Group Calling

CMS agents log in and out of CMS by using the same buttons or codes as calling group members.

System Numbering

To renumber the CMS agent extensions in the system, you must use the 2-digit extension numbering plan.

System Programming

- Set basic system operating conditions:
    - Select the 2-digit System Renumbering plan (2-digit is the factory setting).
    - Set Transfer Return Time for three to five rings.
    - Set Transfer Audible to Ringback.
    - Select the Group Calling/CMS option for the Extension Status feature.
- Remove CMS lines from all telephones (Key mode only) or remove CMS lines from trunk pools (PBX mode only)
- Set up three direct-line console (DLC) system operator positions, two for CMS PC positions and one for the CMS supervisor position:
    - Assign the positions.
    - Assign CMS lines and external alerts to the CMS supervisor's console, and copy the assignments to the CMS PC ports.
- Set up CMS fallback plan:
    - Designate the CMS supervisor console as a Group Coverage sender.
    - Assign the agent telephones to a calling group and assign Group Coverage to the calling group.
- Set up optional equipment and features, including headsets and paging groups.
- Set the ringing options for lines assigned to VMI ports to "no ring."

Hardware Requirements

■ an approved AT&T PC with 640K RAM, 3.5-inch floppy disk drive, and 20-Mbyte hard disk drive

■ an approved AT&T monochrome or color monitor

■ CMS interface card with two 14-foot, 4-pair modular plug station cords, and one 14-foot DIN connector cord for connection to Digital Voice Announcement Unit

■ CMS software

■ DA-5 Digital Voice Announcement Unit

■ parallel printer — AT&T 570 or 571 printer

■ parallel printer cable connecting the printer to the PC parallel port

■ supervisor console — MERLIN II System Display Console

■ agent telephones — any MLX or analog multiline telephones supported by the communications system

■ two analog multiline modules (008 or 408); one to connect the two PC ports to the station jacks (ports) assigned as DLCS, and one to connect the CMS supervisor console

Figure 3-4 illustrates the connection of a CMS to the control unit.
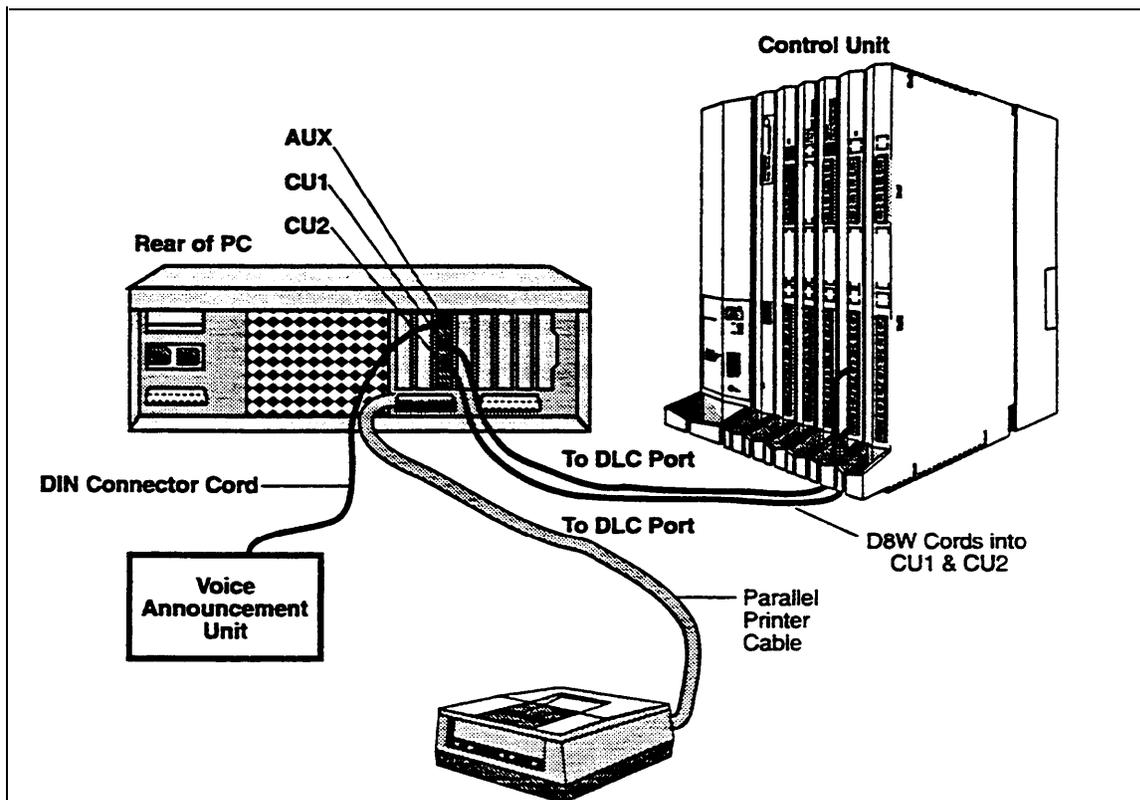
Figure 3-4   CMS Connection to Control Unit

Integrated Solution II

Integrated Solution II (IS II) is a complete package of UNIX-based voice processing and call analysis software applications that assists businesses in the management of telephone usage and costs. IS II offers a single interface to and can include any of the following software:

■ **Integrated Voice Power Automated Attendant (IVP AA).** The IVP AA answers telephones automatically and transfers callers to the appropriate departments or extensions. Callers are provided with a menu of recorded prompts that they respond to by dialing numbers on a touch-tone telephone.

Callers without touchtone telephones can be transferred to the system operator, who then handles their calls. Separate menus for day and night service as well as multilevel menus and corresponding announcements can be setup to ensure that callers reach the right person or department as quickly as possible.

IVP AA can operate in touch-tone gate mode or in no-gate mode. To speed handling of calls from touch-tone telephones, gate mode prompts callers to dial 1 to continue to the main menu. If a 1 is not dialed within a programmed interval, calls are automatically transferred to the system operator. In the no-gate mode, callers hear the main menu immediately, and if no response is received after the main menu is played, calls are transferred to the system operator.

IVP AA is a low-cost alternative for businesses that need enhanced call handling without the added voice messaging capabilities of AUDIX Voice Power—IS II.

■ **AUDIX Voice Power—IS II (AVP).** AVP offers all the features of the IVP AA combined with the following services:

■ **Call Answer.** Allows callers who reach a busy or unanswered extension to leave a message, transfer to another extension, or transfer to a system operator. Individual extension users can program a personal greeting or select a standard greeting and can program a password to prevent others from retrieving their messages.

■ **Voice Mail.** Allows users to send messages to other extensions in the system, forward messages received with comments, and reply to messages received. The system manager can send general messages to everyone in the system.

■ **Information Service.** Provides a customer-oriented, call-in information service that plays a recorded message and then disconnects the caller.

■ **Message Drop.** Offers an answering service, similar to an answering machine, that plays a message to the caller and then allows the caller to "drop off" a message, such as a request for service or an order. Callers cannot direct their messages to specific extensions.

■ **Call Accounting System - IS II (CAS).** CAS collects and analyzes call information, calculates the prices of calls by using rates selected by the business, organizes calls by client or project, and prints reports on a daily or as-needed basis. CAS-IS II provides all of the functionality of CAS along with automatic number identification (ANI). (For more information on the features of CAS, see "Call Accounting System" in this chapter.)

■ **System Programming and Maintenance—IS II (SPM).** SPM is a programming package built into IS II that allows the system manager or a systems technician to upgrade and maintain the communications system and its features, and to add, change, or rearrange telephones. Programming can be done on site or remotely.

The number of incoming lines and subscribers programmed for AVP or IVP AA and the number of busy-hour calls determine how many voice channels are required for the user's system (see Table 3-3).

Table 3-3   Voice Channels Required

No. of Channels Required	Lines	Subscribers	Busy-Hour Calls
2	1 to 6	1 to 20	1 to 20
4	7 to 18	21 to 60	21 to 60
6	19 to 24	61 to 80	61 to 80
8	25 to 42	81 to 200	81 to 200
12	Over 42	201 to 300	201 to 300

New Application Features

The IS II features that are new to the MERLIN LEGEND Communications System module the following:

■ **Dial By Name** permits AVP users to call subscribers by dialing the last name of the subscriber instead of dialing the extension number.

■ **Alternate Personal Greetings** allows a user to record a second personal greeting in addition to the primary call answering greeting.

■ **Fax Transfer** directs incoming fax calls to a designated fax machine.

■ **Class of Service** allows the system manager to assign one of 16 predefined parameters to a subscriber. These parameters define the size of the mailbox, the type of coverage service, and the activation of the outcalling feature.

■ **General Mailbox Options** are two special mailboxes that have reserve extensions associated with them. Callers using rotary telephones or needing assistance can be transferred to leave messages in a general mailbox. Subscribers having problems with the system can report problems to the trouble mailbox.

Mode Differences

Only the Call Accounting System—IS II and the System Programming and Maintenance—IS II applications can be connected to a communications system that operates in the Behind Switch mode.

Considerations

- IS II uses UNIX System V Release 3.2.2.

- IS II stores up to 12 hours of voice-mail messages when IS II includes AVP and over 200,000 call accounting records when IS II includes CAS.

- Either IVP AA or AVP can be installed on the communications system, but not both.

- The system supports up to 12 IVP AA ports (on three circuit boards).

- If IS II includes AVP, when users receive voice-mail messages, the message LEDs on their telephones turn on, provided that a mailbox has been assigned to each of those telephones.

- For AVP or IVP AA, the following symptoms indicate that the system needs more touch-tone receivers.
  - Single-line telephone users do not get dial tone when trying to dial out.
  - AVP or IVP AA fails to transfer calls.
  - Calls fail to ring or calls go to coverage prematurely.

- SPM—IS II reports can be printed out or written to a disk (floppy or hard drive); however, if the reports are written to a disk, they cannot be looked at (write-only file).

- SPM—IS II reports should not be printed while the system is handling more than 100 calls per hour.

System Feature Interactions

Account Code Entry

The account codes users enter before or during calls are used by CAS—IS II to associate calls with accounts and individuals and appear on CAS—IS II reports.

Coverage

An internal call on a VMI port that transfers to an internal extension will not go to coverage. It will continue to ring at the internal extension.

If a sender programs his or her telephone so that only outside calls are sent to coverage, calls received on Intercom or System Access buttons will not be sent to voice mail.

Group Calling

Calls answered by an overflow calling group will get coverage mode codes; the overflow calling group's number will appear in the called party field of the mode code.

Leave Word Calling

If a Leave Word Calling message is left in a mailbox in a system with heavy VMI traffic, the user may have to dial out manually for messages.

Night Service

If the AVP Automated Attendant only handles after-hours calls, a dummy station (an unused station jack) must be programmed as a member of a Night Service group associated with a system operator. In turn, this dummy station is covered by a calling group with integrated VMI ports as members. If an incoming call is not answered in the programmed number of rings, the control unit sends the call to the calling group with the VMI ports. Because of prior programming, AVP recognizes the call to be from the dummy station and provides Automated Attendant service rather than the usual Call Answer service.

Station Message Detail Recording

CAS—IS II uses the call information provided by the communications system's built-in SMDR feature to process calls.

Note: There are two formats for SMDR: basic and ISDN-PRI.

Transfer

VMI ports can transfer an incoming call to an outgoing line/trunk.

If a caller incorrectly specifies the answering VMI port as the desired transfer destination station, the VMI port can inadvertently park the call.

Any calling group, calling group member, or station can be programmed to be a VMS transfer redirect extension. If a QCC is programmed as such, the transfer redirect call is delivered to the QCC as a returning call and is not placed in the QCC queue.

If a transferred caller gets no answer and returns via voice mail to the system operator, the system operator has no indication of the origin of the call.

System Programming

The following must be programmed when IS II includes IVP AA:

■ Designate inside dial tone to be the same as the outside line/trunk dial tone.

■ Assign all Automated Attendants connected to the system to the same calling group and set the group type as "VMI Generic."

■ Program each VMI loop-start port for "reliable" far-end disconnect.

■ Designate a backup position, such as the system operator, to receive calls that were originally transferred to unanswered or busy extensions or when a caller fails to respond to the message.

■ Specify the number of rings before a call transferred by the voice messaging system is sent to the backup position.

The following must be programmed when IS II includes AVP:

■ Assign AVP ports to a calling group and specify the group type as "VMI Integrated."

■ Program each VMI loop-start port for "reliable" far-end disconnect.

■ Specify the touch-tone duration and interval between digits in codes sent between the AVP and the communications system.

███████████████████

■ Specify the number of rings before a call transferred by the AVP is sent to the backup position (system operator).

■ When the AVP Automated Attendant is used only for Night Service:

  ■ If the lines/trunks set for answering by the Automated Attendant appear at other stations, set the "no ring" option for the other stations.

  ■ Assign the dummy station to a Night Service group for each system operator position.

  ■ Assign the dummy station to a coverage group, and assign the VMI calling group to cover that coverage group.

  ■ Specify the VMI ports that provide Automated Attendant to be Automated Attendant ports.

  ■ Specify the business schedule for AVP.

Hardware Requirements

An 80-Mbyte or 200 Mbyte hard disk drive is required if IS II includes either IVP AA or AVP.

■ IS II uses an AT&T Master Controller based on an 6386/SX WGS Processor with UNIX System V/386 Release 3.2.2, which includes the following components:

  ■ Master Controller II processor (with 40-Mbyte, 80-Mbyte, or 200-Mbyte hard disk and a 3.5-inch floppy disk drive)

  ■ video monitor (monochrome or color)

  ■ keyboard

  ■ optional tape drive (required for systems with a 200-Mbyte hard disk for saving UNIX files, application program files, administrative files, and voice system files during backup)

■ A 355 AF adapter for connecting the Master Controller to the serial port on the control unit if they are within 50 feet of each other and are on the same AC branch circuit

■ ADUs for connecting the Master Controller to the serial port on the control unit, if they are not within 50 feet of each other and/or are not on the same AC branch circuit

■ Any additional hardware required by the individual applications included in IS II, including the cables and adapters for connecting the applications to the system (see the instruction booklet that comes with each application)

■ IVP4 boards

■ 012 basic telephone module to provide the tip/ring interface for IVP AA or AVP

Figures 3-5 and 3-6 show the connection of the IS-II Master Controller to the control unit, depending on whether or not the Master Controller and control unit are over 50 feet from each other and are connected to the same AC power branch circuit.
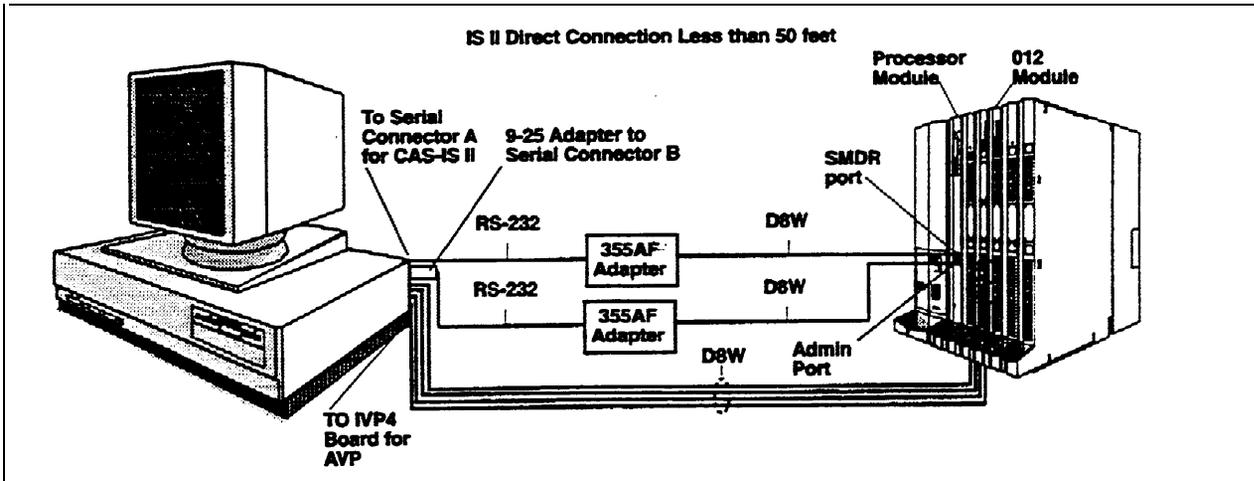
Figure 3-5   IS II Connection Less Than 50 Feet
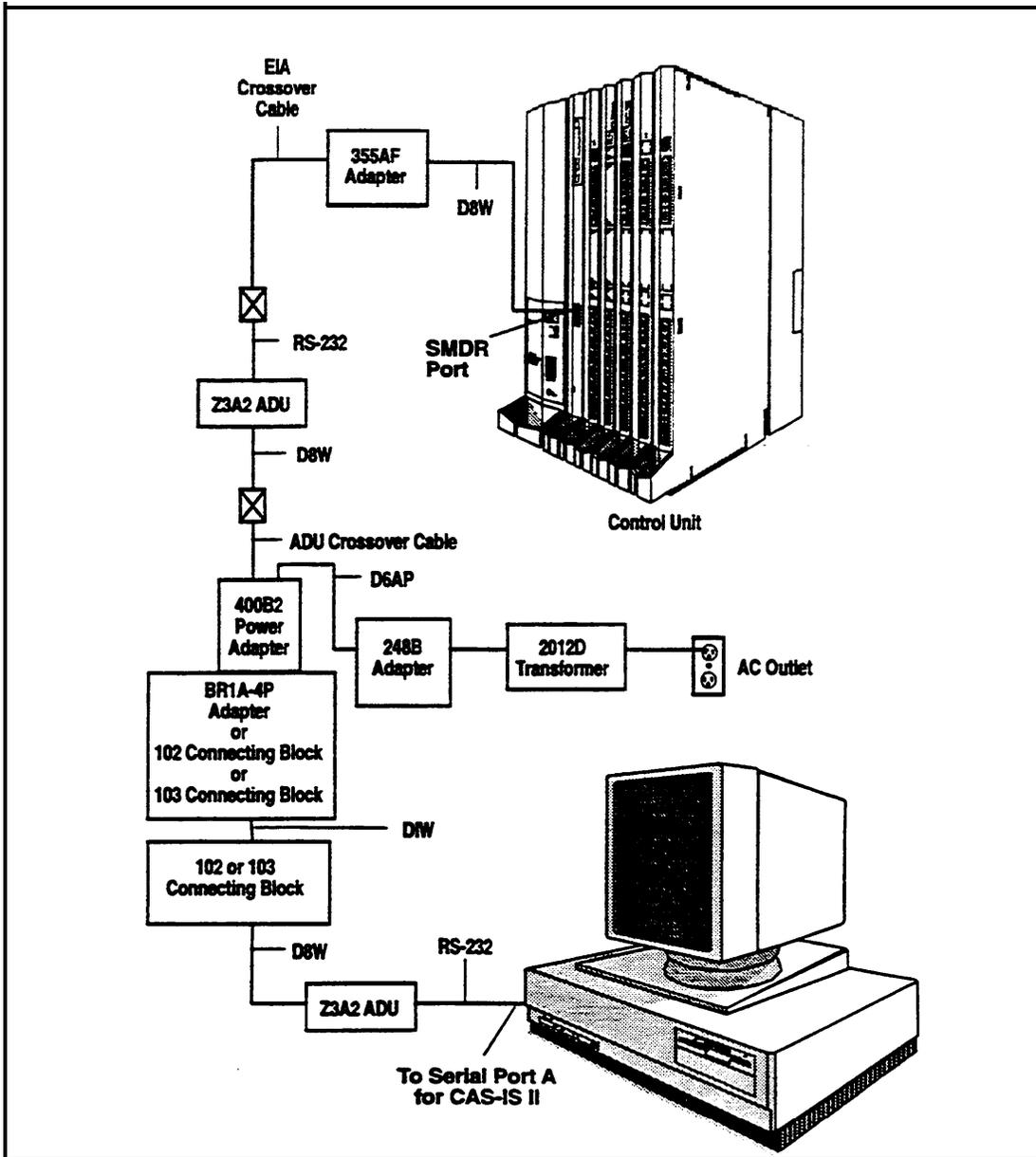
Figure 3-6   IS II Connection 50 Feet or More
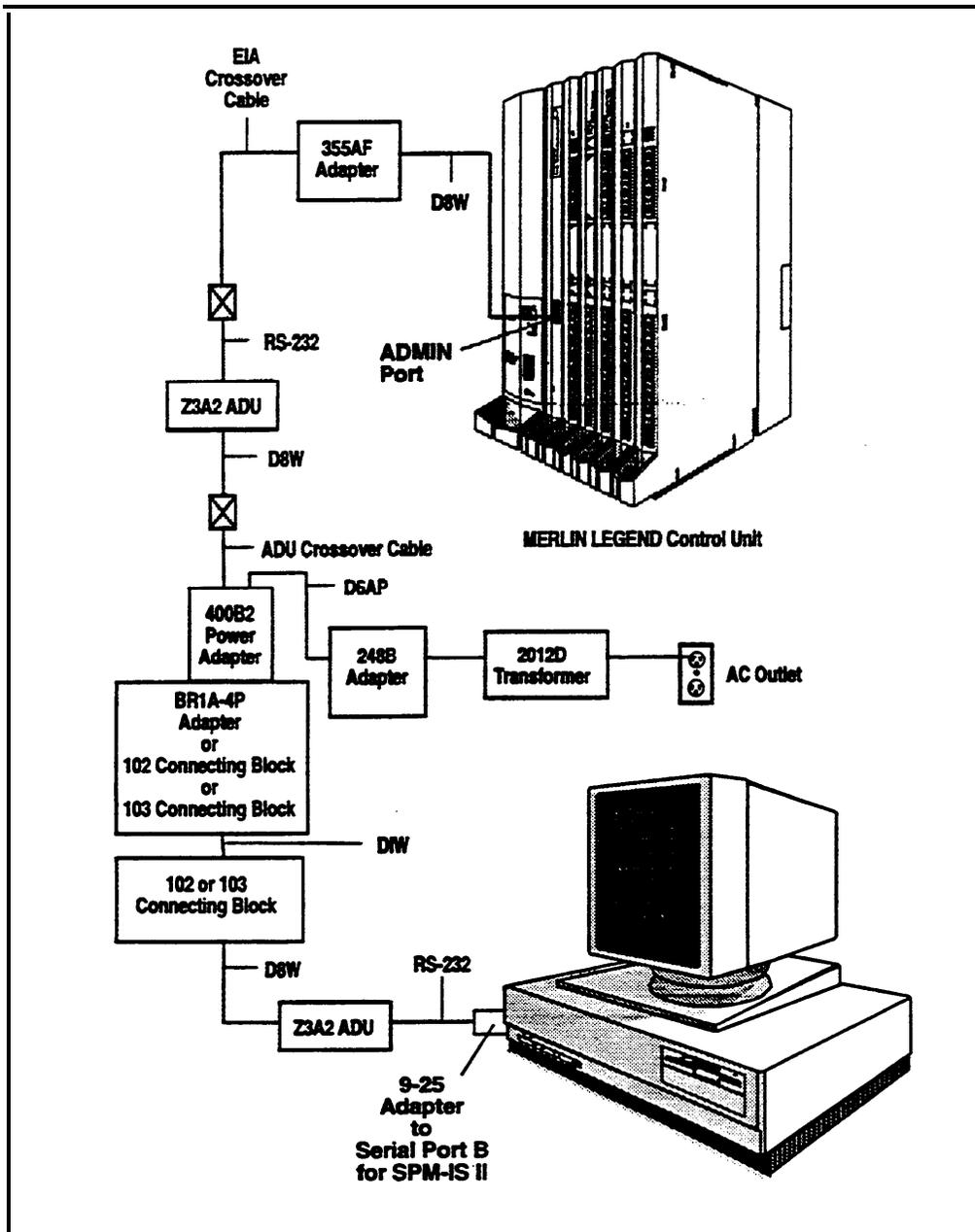
Figure 3-7   SPM-IS II Connection 50 Feet or More

MERLIN Attendant

The MERLIN Attendant is a stand-alone application product that provides system operator-like services via prerecorded messages and electronic switching.

The Attendant automatically answers incoming calls on designated lines with a recorded greeting and transfers these calls to extensions or departments based on information provided by the caller. Since the Attendant can respond only to touch-tone telephone signals, the announcement asks callers who dial from rotary telephones to wait for the system operator.

Calls can be transferred in one of two ways, either "blind" or "supervised." A blind transfer means the Attendant dials the extension or department requested by the caller and disconnects. If the call is not answered or the telephone is busy, the caller is routed to the system operator.

With a supervised transfer, the Attendant transfers the call and can retrieve it if the transfer is unsuccessful. The Attendant then directs the call to another telephone, allows the caller a second route choice, or provides a failed-transfer announcement, depending on how the application is programmed.

Calls can be answered immediately (Primary Call Handling) or after a delay (Secondary Call Handling), for example, if the call goes unanswered by the system operator after a certain number of rings. Table 3-4 shows the number of Attendants required based on a Primary Call Handling situation.

The number of attendants required depends on the number of incoming lines/trunks and the number of busy-hour calls (see Table 3-4).

Table 3-4   Number of Attendants

No. of Attendants Required	2	3	4
Incoming Lines/Trunks	1 to 6	7 to 9	10 to 12
Busy-Hour Calls	1 to 25	25 to 50	50 to 100

Mode Differences

The MERLIN Attendant cannot be connected to a communications system that operates in the Behind Switch mode.

Considerations

■ The MERLIN Attendant cannot be connected to a communications system that has an AUDIX Voice Power application or a MERLIN MAIL Voice Messaging System installed.

- A maximum of four Attendants can be connected to the communications system.

- The Attendant can answer every call that comes in or just answer calls that ring on certain lines.

- Unanswered transferred calls do not return to the Attendant; they are redirected to a designated extension, such as the system operator.

- If the extension called is busy or unanswered or if it is after business hours, calls can be directed to an answering machine to allow callers to leave messages.

- The Attendant can direct and transfer calls to fax machines.

- The following symptoms indicate that the system needs more touch-tone receivers.

  - Single-line telephone users do not get dial tone when trying to dial out.

  - MERLIN Attendant fails to transfer calls.

  - Calls fail to ring or calls go to coverage prematurely.

- The Attendant provides 64 seconds for recording up to five standard messages, including the caller greetings used during and after business hours, a hold announcement for a caller who is being transferred, a connect announcement for the department or extension receiving a transferred call, and a message explaining that a call cannot be completed.

- When the Attendant is setup for after-hours operation, the time on the Attendant's clock must match the system clock so the end of the business day is recognized.

System Feature Interactions

Coverage   An internal call on a VMI port that transfers to an internal extension does not go to coverage but continues to ring at the internal extension.

Group Calling   All Attendants connected to the system are assigned to the same calling group via system programming.

Calls answered by an overflow calling group will get coverage mode codes; the overflow calling group's number will appear in the called party field of the mode code.

Night Service   The Attendant works with the communications system's Night Service feature to provide specialized after-hours service. The Attendant can answer calls on lines it does not handle during business hours or direct calls to ring at a specific night extension or department, such as Building Security. A special night announcement can greet after-hours callers.

Privacy   Privacy must be programmed for each station jack that has an Attendant
                                            connected to it.

Transfer   VMI ports can transfer an incoming call to an outgoing line/trunk.

                                            If a caller incorrectly specifies the answering VMI port as the desired transfer
                                            destination station, the VMI port can inadvertently park the call.

System Programming

- Designate inside dial tone to be the same as the outside line/trunk dial tone.
- Assign all Attendants to a calling group and set the group type to "VMI Generic."
- Designate a transfer redirect extension, such as the system operator, to receive calls that were originally transferred to unanswered or busy extensions, or to receive calls when a caller fails to respond to the message.
- Program all calling groups as "auto-logout." (Auto-logout is the default.)
- Program Privacy for each station jack used to connect an Attendant.

Hardware Requirements

- 012 basic telephone module
- MERLIN Attendant unit and cords

MERLIN MAIL Voice Messaging System

The MERLIN Mail Voice Messaging System offers integrated call management services at low cost. Its services are as follows:

■ **Automated Attendant.** Telephones are answered automatically and callers are transferred to the appropriate departments or extensions. Callers dial numbers on a touch-tone telephone to respond to a series of recorded prompts. If there is no answer or the extension is busy, callers can be given the option to leave a message or try another extension. Callers without touch-tone telephones can be transferred to the system operator, who then handles their calls.

Separate menus for day and night service, as well as multilevel menus and corresponding announcements, can be set up to ensure that callers reach the right person or department as quickly as possible.

In addition, the Automated Attendant can direct calls to a fax machine. If the fax machine is busy or does not answer, the call is automatically disconnected.

Calls are transferred by the Automated Attendant in one of two ways: either "blind" or "supervised." A blind transfer means the Automated Attendant dials the extension or department requested by the caller and disconnects. If the call is not answered or the telephone is busy, the call is routed to the system operator.

With a supervised transfer, the Automated Attendant transfers the call and can retrieve it if the transfer is unsuccessful. The Automated Attendant then directs the call to another telephone, allows the caller a second route choice, or provides a failed-transfer announcement, depending on how the application is programmed.

■ **Call Answer.** Callers who reach a busy or unanswered extension are connected to the called party's personal greeting and the caller can leave a message in the called party's mailbox. If no personal greeting is available, the caller hears a general message with the recorded name of the called party and then is instructed to leave a message.

If the called party's mailbox is full, Call Answer connects the caller to a general mailbox where the caller hears a message with the called party's recorded name. The caller can then leave a recorded message. The system manager is responsible for forwarding the messages in the general mailbox to the appropriate users.

Call Answer tells callers when the general mailbox is full and the caller can transfer to another extension.

When a user receives a message, the message LED on the telephone goes on. If a message is left in the general mailbox, the system manager's message LED goes on.

■ **Voice Mail.** Users can send messages to other extensions in the system, forward messages received with comments, and reply to messages received. Users can also record a personal greeting and program a password to help prevent others from retrieving their messages.

The number of incoming lines and subscribers programmed for Automated Attendant service and the number of busy-hour calls determine how many MERLIN MAIL ports are required for the user's system (see Table 3-5).

Table 3-5   MERLIN MAIL Ports Required

No. of Attendants Required	2	4
Incoming Lines/Trunks	1 to 6	7 to 18
No. of Subscribers or Busy-Hour Calls	1 to 20	21 to 60

New Application Features

The MERLIN MAIL Voice Messaging System features that are new for the MERLIN LEGEND Communications System include the following:

■ **Outcalling** automatically calls the user at a number that the user has programmed when a new message is received. The user then can log into the VMS to retrieve messages.

■ **Pager Notification** calls the user at a designated number when a new message is received. However, the user cannot log into the VMS.

■ **Broadcast Lists** allows the system administrator to send a message to every user on the MERLIN MAIL Voice Messaging System. However, this message does not light message LEDs and does not cause outcalling.

■ **Fax Transfer** directs an incoming fax call to a designated fax station. This fax station can be a single machine or a calling group with several machines.

■ **Announcement Service** allows a caller to enter a code to hear information about specific subjects, such as new product information or marketing programs.

Mode Differences

The MERLIN MAIL Voice Messaging System cannot be connected to a telephone system that operates in the Behind Switch mode.

Considerations

■ The MERLIN MAIL Voice Messaging System is available in two-port and four-port configurations. Both models have four hours of message storage capacity.

■ The size of a user's mailbox — that is, the number of minutes of messages that a mailbox can hold — can be matched to individual needs. A mailbox can be setup to hold a maximum of 15 minutes of messages.

■ When users receive voice-mail messages, the message LEDs on their telephones turn on, provided that a mailbox has been assigned to each of those telephones.

■ Callers who dial from rotary telephones cannot use the features of the MERLIN MAIL Voice Messaging System and should be directed to the system operator during business hours.

■ Automated Attendant can answer calls immediately (Primary Call Handling) or after a delay (Secondary Call Handling), for example, when a call remains unanswered by the system operator after a certain number of rings.

■ The MERLIN MAIL Voice Messaging System does not work with the MERLIN Attendant.

■ Programming of the MERLIN MAIL Voice Messaging System is done via touch-tone interface. The MERLIN MAIL Voice Messaging System is equipped with an RS-232 serial port and an external modem to support remote diagnostics.

■ The following symptoms indicate that the system needs more touch-tone receivers.
 ■ Single-line telephone users do not get dial tone when trying to dial out.
 ■ The MERLIN MAIL Voice Messaging System fails to transfer calls.
 ■ Calls fail to ring or calls go to coverage prematurely.

■ Call restrictions should be assigned to the station jacks that connect the MERLIN MAIL Voice Messaging System to the system to prevent toll calls from being dialed through this product.

System Feature Interactions

Coverage

All extensions that need to be covered are assigned to a coverage group through system programming. The calling group that is made up of MERLIN MAIL Voice Messaging System ports is designated as the coverage receiver for the group.

An internal call on a VMI port that transfers to an internal extension will not go to coverage. It will continue to ring at the internal extension.

If a sender programs his or her telephone so that only outside calls are sent to coverage, calls received on intercom or System Access buttons will not be sent to voice mail.

Group Calling

All the station jacks to which the MERLIN MAIL Voice Messaging System ports are connected are assigned to the same calling group through system programming.

Calls that overflow from one calling group to another calling group with integrated VMI ports are treated and identified as coverage calls. This occurs because the control unit sends the appropriate coverage call mode codes along with the calling group number.

Leave Word Calling   If a Leave Word Calling message is left in a mailbox in a system with heavy VMI traffic, the user may have to dial out manually for messages.

Night Service   The MERLIN MAIL Voice Messaging System Automated Attendant works with the system's Night Service feature to provide specialized after-hours service. Automated Attendant can answer calls on lines it does not handle during business hours or can direct calls to ring at a specific night extension or department, such as Building Security. A special night announcement can greet after-hours callers.

If the Automated Attendant only handles after-hours calls, a dummy station (an unused station jack) must be programmed as a member of a Night Service group associated with a system operator. In turn, this dummy station is covered by a calling group with integrated VMI ports as members. If an incoming call is not answered in the programmed number of rings, the control unit sends the call to the calling group with the VMI ports. Because of prior programming, the MERLIN MAIL Voice Messaging System recognizes the call to be from the dummy station and provides Automated Attendant service rather than the usual Call Answer service.

Privacy   Privacy must be programmed for each port designated for the MERLIN MAIL Voice Messaging System.

Ringing Options   If lines set for answering by the Automated Attendant also appear on telephones other than the system operator console or a backup station, these lines should be programmed for "no ring."

Transfer   VMI ports can transfer an incoming call to an outgoing line/trunk.

If a call received on a line/trunk is transferred to a VMI port, the direct inside access mode code is sent and the call is treated as a transferred call; the caller hears the internal greeting.

If a caller incorrectly specifies the answering VMI port as the desired transfer destination station, the VMI port can inadvertently park the call.

Any calling group, calling group member, or station can be programmed to be a VMS transfer redirect extension. If a QCC is programmed as such, the transfer redirect call is delivered to the QCC as a returning call and is not placed in the QCC queue.

If a transferred caller gets no answer and returns through voice mail to the system operator, the system operator has no indication of the original or the call.

System Programming

■   Assign all the MERLIN MAIL Voice Messaging System ports to a calling group and set the group type to "VMI integrated."

■ Program VMI loop-start ports for the MERLIN MAIL Voice Messaging System for "reliable" far-end disconnect.

■ Specify the touch-tone duration and interval between digits in codes sent between the MERLIN MAIL Voice Messaging System and the communications system.

■ Specify the number of rings before a call transferred by the MERLIN MAIL Voice Messaging System is sent to the backup position (system operator).

■ Specify that telephone company dial tone must be provided for intercom dial tone.

■ Assign Privacy for each station jack used to connect the MERLIN MAIL Voice Messaging System.

■ Assign call restrictions to each station jack used to connect the MERLIN MAIL Voice Messaging System.

■ When the Automated Attendant is used only for Night Service:

  ■ If the lines/trunks set for answering by the Automated Attendant appear at other stations, set the "no ring" option for the other stations.

  ■ Assign the dummy station to a Night Service group for each system operator position.

  ■ Assign the dummy station to a coverage group and assign the VMI calling group to cover that coverage group.

  ■ Specify the VMI ports that provide Automated Attendant to be Automated Attendant ports.

  ■ Specify immediate answer (one ring) for the VMI ports.

  ■ Specify the dummy station to have a Class 15 mailbox (Class 15 mailboxes have Automated Attendant instead of Call Answer).

  ■ Specify the business schedule for the MERLIN MAIL Voice Messaging System.

Hardware Requirements

■ MERLIN MAIL Voice Messaging System unit and power cords

■ remote maintenance device (with a wall-mount transformer)

■ modem cable with a 9-pin connector at one end and a 25-pin connector at the other end to connect the remote maintenance device to the serial port on the MERLIN MAIL Voice Messaging System unit

■ D4BU modular cords (2 for a 2-port system or 4 for a 4-port system, plus 1 for the remote maintenance device)

■ 012 basic telephone module

  Note: Additional touch-tone receivers (TTRs) may be needed to allow the 012 module to handle a large number of voice connections.

Figure 3-8 shows the connection of a MERLIN MAIL Voice Messaging System unit to the control unit.
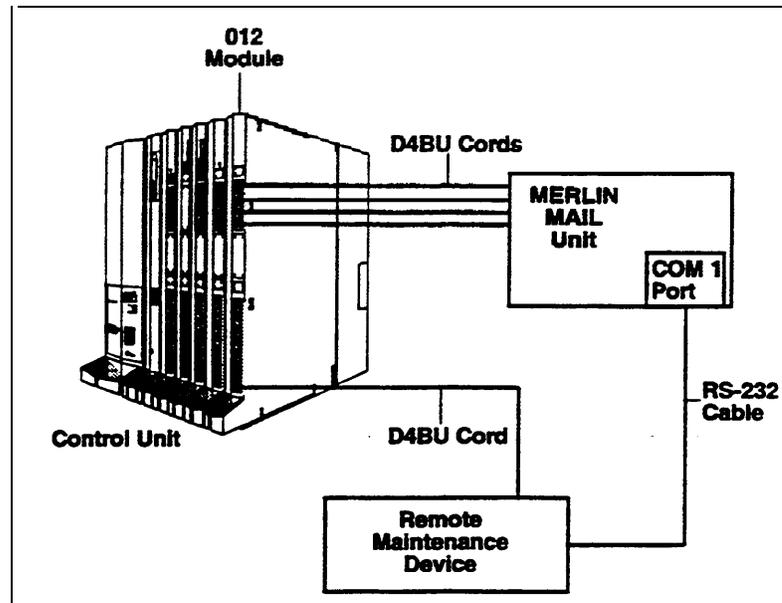
Figure 3-8   Connection of MERLIN MAIL Voice Messaging System

System Programing and Maintenance (MS-DOS)

System Programming and Maintenance (SPM) is an MS-DOS-based software application that allows the use of a personal computer (PC) for programming and maintaining the communications system. SPM performs the same functions as an MLX-20L telephone used as a system programming console but has some additional features, such as the ability to back up and restore files and print reports. The PCs display shows the same button and screen layout as an MLX-20L telephone.

A PC with SPM can be connected directly to the communications system or the system can be accessed remotely in one of the following ways:

■ Using the system's Remote Access feature, the system programmer dials the system directly. A password can be set up to prevent unauthorized access.

■ The system programmer dials the system operator and asks to be transferred to the system's built-in modem.

Considerations

■ SPM operates with MS-DOS version 3.2 or later.

■ Unless the system is being backed up or restored, someone using SPM from a remote location takes priority over a local user. If the local user is programming when a remote user connects to the system, the system sends a message to the local user that a remote connection has been made and disconnects the local user.

■ The PC with SPM connects to the RS-232 jack on the processor module of the control unit. The speed of the interface of the RS-232 jack is 1200/2400 bps with auto speed adjust.

■ SPM reports can be printed out or can be written to a disk (hard or floppy).

■ SPM reports should not be printed while the system is handling more than 100 calls per hour.

■ A printer connected to the PC with SPM can be used to print system programming reports. Or reports can be sent to the printer that is connected to the SMDR port on the system's control unit.

■ SMDR information may be lost while system programming reports are printed via the SMDR port.

■ A UNIX-based version of System Programming and Maintenance is available as part of Integrated Solution II, discussed earlier in this chapter.

Hardware Requirements

■ an approved AT&T PC or other MS-DOS compatible PC with the following:

  ■ at least 128K of RAM

  ■ a double-sided floppy diskette drive (either 5 1/4" or 3 1/2")

■ a serial port assigned to COM1 or C0M2. The serial port can use either a DB-9 or DB-25 connector. If a DB-9 connector is used, a 9-pin to 25-pin adapter is also required. The 9-pin side must be female.

■ a monochrome or color monitor

■ D8W modular cord and 355AF modular adapter if PC is less than 50 feet from the control unit. Distances of greater than 50 feet require back-to back ADUs.

The connection of SPM to the control unit depends on whether or not the distance between the control unit and the PC is less than 50 feet and whether or not the control unit and the PC are plugged into the same AC power branch circuit. Figure 3-9 shows the connection when the distance is less than 50 feet and the control unit and the PC are plugged into the same circuit. Figure 3-10 illustrates the connection when the distance is 50 feet or more and the control unit and the PC are plugged into different circuits.
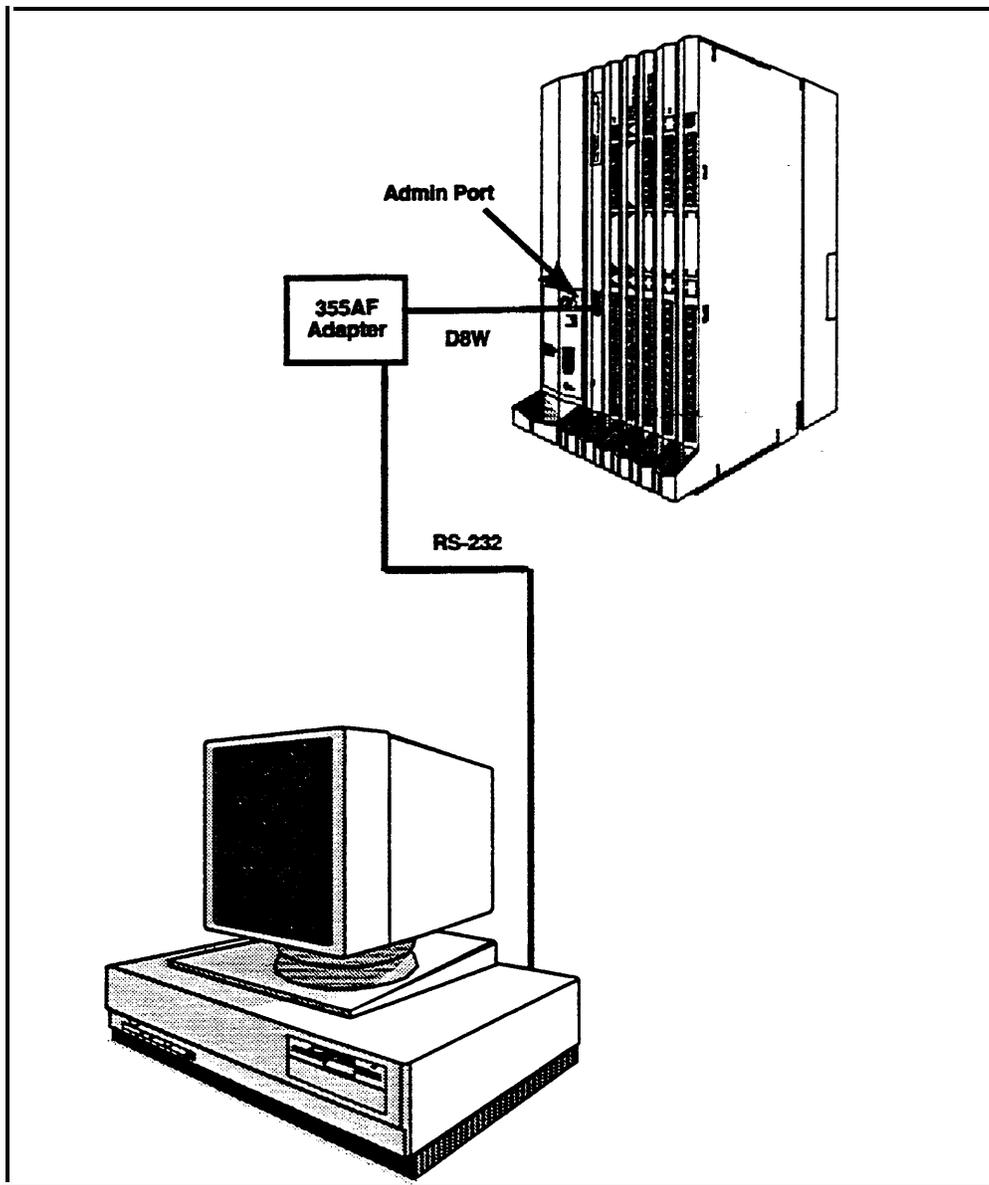
Figure 3-9   Connection of SPM Under 50 Feet
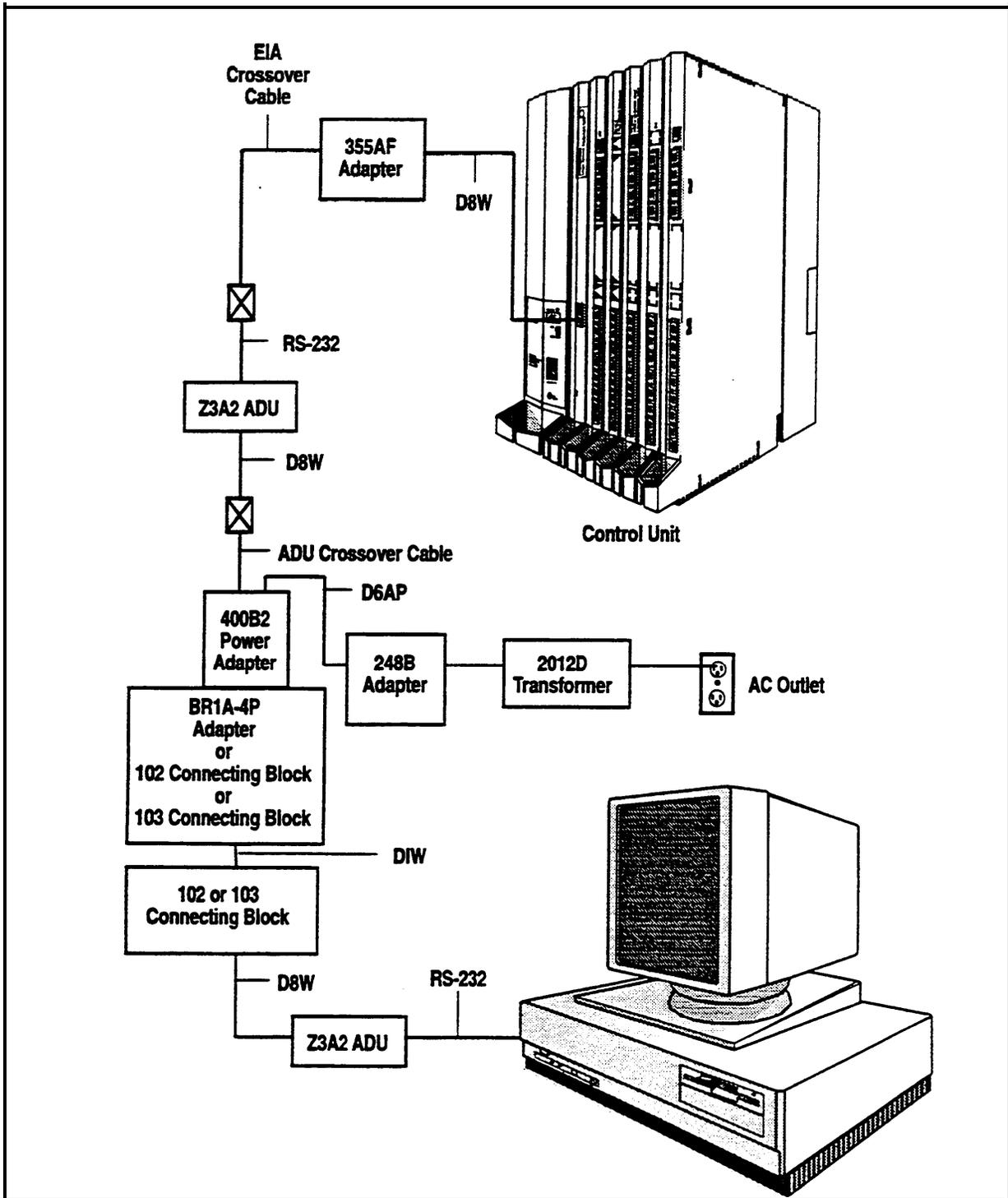
Figure 3-10   Connection of SPM 50 Feet or More

Functional Description

4

This chapter describes the internal functioning of the communications system, including control unit operation, system modes of operation, line/trunk and station module operation, system alarms, and power failure transfer.

Control Unit Operation

The control unit contains the following functional units:

■ the processor module

■ the carrier

■ the power supply module

■ the line/trunk and station modules

This section describes the control unit functional units, their relationships, and how signals are processed.

Functional Units

The functional units are the processor module, which controls the operation of the system and its features; the power supply module, which supplies power to the control unit; the carrier with its backplane assembly, which contains the input/output (I/O) bus and the time-division multiplex (TDM) bus; and the line/trunk and station modules, which connect the outside lines/trunks to the stations. All the modules are electrically connected to the backplane, which provides common circuitry for the I/O bus, the TDM bus, and power distribution. (See Figure 4-1 for a functional block diagram of the system architecture.)

The processor module is connected to intelligent ports on the line/trunk and station modules, through the I/O bus, by the digital switch element (DSE) on each line/trunk and station module. The TDM bus also is connected to the DSE of each line/trunk and station module. The two busses are illustrated in Figure 4-1 and described on the following page.
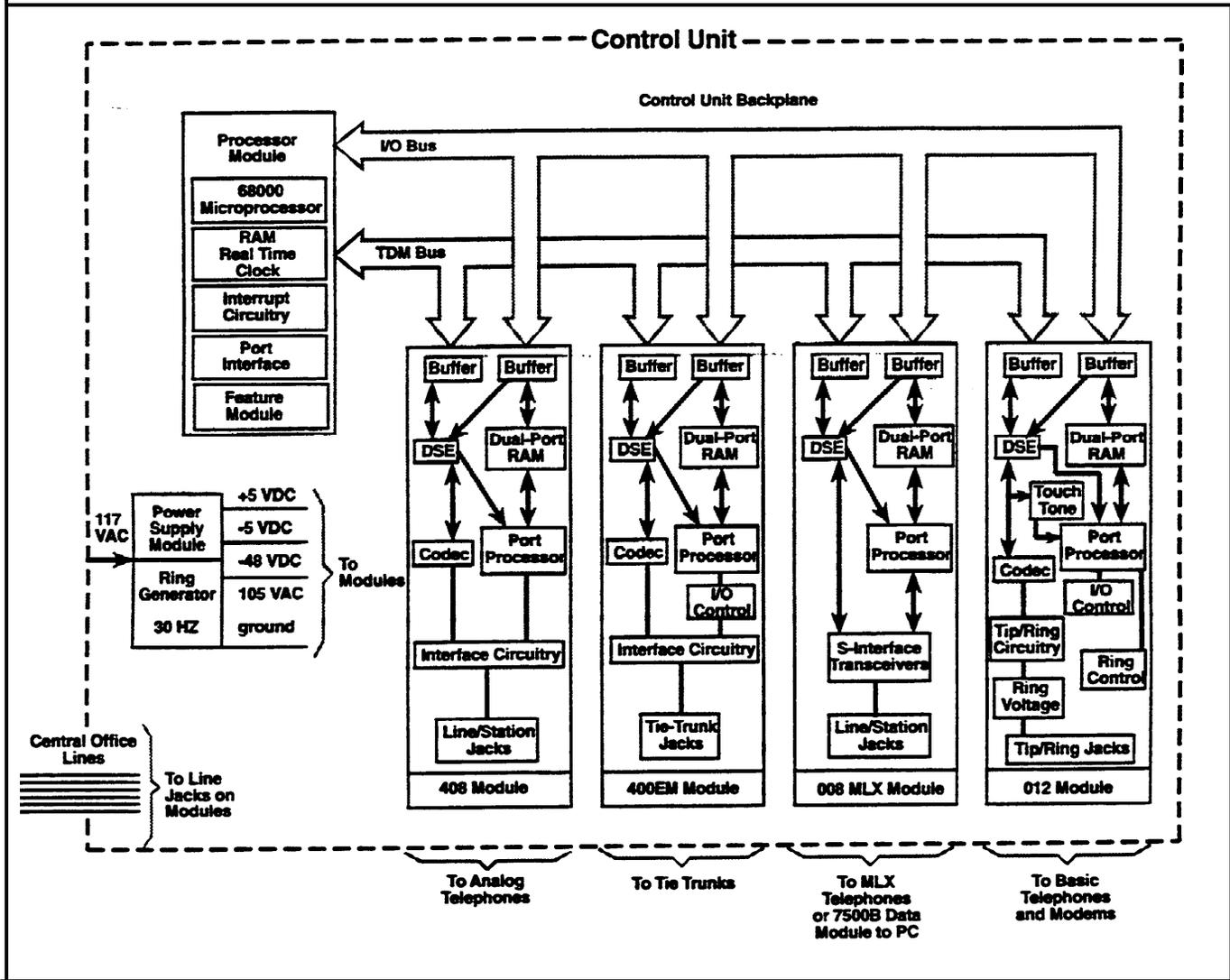
Figure 4-1   Functional Units

■ Input/Output Bus. The I/O bus contains a 16-bit address bus and an 8-bit data bus. The address bus selects the module that receives instructions from the 68000 microprocessor in the processor module. The microprocessor provides instructions to the port processors and DSEs through the 8-bit data bus.

■ Time-Division Multiplex Bus. The TDM bus connects the DSEs to allow voice or data to flow in and out of the system. The TDM bus is parallel, 8 bits wide, and runs at 2.048 MHz (256 time slots x 8 kHz = 2.048 MHz). Each TDM cycle has 256 time slots for voice, data, tones, and clocks. The frame repetition rate is 8 kHz, providing a 64-kbps channel on each time slot (8-bit bus x 8 kHz = 64 kbps).

The built-in data modem connects to the TDM bus; this permits access from a local or remote PC or workstation equipped with a 1200-bps modem. The TDM bus connects with the built-in diagnostics that enable the processor to read and write to dedicated TDM test slots.

Voice signals on the TDM bus are encoded in Mu-Law 255 pulse code modulation (PCM) format for domestic use. The system provides a circuit-switched connection for transmission of digital data signals up to 64 kbps.

Signal Processing

Because the system is internally a digital system in a world of both analog and digital devices, it must accurately translate analog signals. Doing this involves signal conversion, quantizing, commanding, and switching.

Signal Conversion

The first step in analog-to-digital conversion is to sample the analog signal by taking samples of the height of the analog waveform at 8000 times per second. This sampling is called pulse amplitude modulation (PAM). Because the analog signal is sampled at more than twice its bandwidth (for analog voice the bandwidth is 3300 Hz), both the amplitude and frequency content of the original analog signal are preserved. The amplitude of each sample is digitally encoded and transmitted. At the receiving end, the digital signals are decoded and then reconstructed to their original analog form by the analog-to-digital converters (codecs) in the system.

A codec digitizes each sample of the analog signal into a distinct 8-bit PCM binary code (per CCITTG.711).

The digitally encoded signals are routed from one interface port to another interface port by assigning source and destination to specific time slots on the TDM bus. In this way, signals can be transmitted to one or several destinations and reinstructed at the original amplitude. The result is no signal loss during switching and transmission from one point to another.

Quantizing

The process of converting PAM samples into discrete PCM values is called quantizing. In the case of voice-grade signals, 8 bits are commonly used to encode one PAM sample. Quantizing with 8 bits allows 256 unique values to represent the range of amplitudes in the analog signal being sampled.

Quantizing causes distortion due in part to the "rounding off" of PAM samples into discrete PCM values. This distortion can be minimized by increasing the number of bits used to encode each PAM sample or by increasing the sampling rate. Using 8-bit coded samples taken at an 8-kHz rate results in toll-grade transmission quality.

Commanding

Distortion also occurs in quantizing because equal consideration is given to all amplitude levels. Linear quantizing divides the amplitude range into equal segments, which results in unnecessary quality at levels where voice signals are unlikely to occur and not enough quality where they do occur. Commanding eliminates this distortion by using a nonlinear scale that has smaller divisions and more accuracy in areas of the scale where voice signals are most likely to occur.

Mu-Law 255

Mu-Law 255 is a commanding scheme that uses a compression ratio compatible with modem channel bank equipment. The scale is divided into 16 intervals, with each interval having 16 levels. Therefore, the scale has 256 discrete values. But since Mu-Law 255 has a negative and a positive zero, it really has only 255 discrete values. This commanding scheme is used in the United States and Japan.

Digital Switching

The TDM bus allows many users to communicate over a common electrical connection because it is physically distributed across the backplane of the control unit and connects all line/trunk and station modules.

The TDM bus can specify time slots for various functions. For example, during a conversation between station A and station B, a time slot is reserved for station A to transmit on and for station-B to receive on. For example, station A talks on time slot 150 and listens on time slot 160. Station B talks on time slot 160 and listens on time slot 150. Because the TDM bus cycles 8000 times per second, the conversation appears to be continuous.

The TDM bus carries touch-tone and call-progress signals to stations via time slots 0 to 39. Unlike other bus configurations, the stations on the TDM bus receive all transmissions. If a station is not assigned to any of the time slots, the station ignores the data.

The DSE handles voice and data. It also performs the operations for commanding schemes such as Mu-Law and A-Law. Each module has a DSE to interface codecs or digital transceivers to the TDM bus. The actual digital switching occurs when the DSE is programmed by the system I/O bus to transmit data on or receive data from the TDM bus in specific time slots. In addition, the DSE can sum digital signals from designated TDM slots to provide for five-party conferencing.

Tie-Trunk Signaling

Tie trunks transmit via three different signaling formats, each made up of a specific mode and a specific type.

The dual in-line packaging (DIP) switches on the 400EM module select the signaling modes needed for tie-trunk transmission; the signaling type is selected during system programming.

Signaling Modes

There are two signaling modes:

■ **Simplex mode.** Two signaling leads superimposed onto the analog transmission leads provide a 2-pair wire interface for connecting two local systems at minimal cost.

■ **E&M mode.** This is a standard interface. The E&M signaling leads are isolated from the transmission leads, requiring a 3-pair wire interface.

In the simplex mode, protective resistance is always included in the circuit. The E&M mode can be either protected or unprotected from high-voltage transients or fluctuations. In the protected mode, a resistance is added to the leads to reduce current peaks. The protected mode is used when there is no network interface to protect the circuit from outside interference.

The unprotected mode must be used for an E&M type 1 standard interface (see below) to meet the specified voltage-drop criteria. This mode is used when there is a network interface.

Signaling Types

Three different signaling types combine with the signaling modes. Together these create the proper signaling format for each system.

■ **Type 1 standard.** This is the factory-set type, which is used to connect two systems through two intermediate telephone company central offices. The switches must be set for E&M mode.

■ **Type 1 compatible.** This type is used to connect directly without intermediate telephone company central offices. One system is set to type 1 standard, the other to type 1 compatible. The switches must be set for E&M mode.

■ **Type 5 simplex.** This type is used to connect similar systems or systems With compatible signaling that are located in the same building or on the same business campus.

The choice of a tie-trunk signaling format to connect two systems depends on the particular application and the systems being connected, including whether or not the tie-trunk signals pass through telephone company lines or over customer-owned cable. Table 4-1 shows how to determine tie-trunk compatibility between this system and other systems.

Table 4-1 Tie-Trunk Compatibility

| Installation Situation | | Preferred Signaling Format | | | |
| From MERLIN LEGEND System | | MERLIN LEGEND System | | Far End | |
To	Location	Signaling Mode and Type	Protected or Unprotected	Signaling Mode and Type	Protected or Unprotected
MERLIN LEGEND MERLIN II	Same site or interbuilding	Type 5 simplex	N/A	Type 5 simplex	N/A
System 25 System 75	Same site or interbuilding	Type 5 simplex	N/A	Type 5 simplex	N/A
System 85 or DEFINITY	Same site or interbuilding	Type 5 simplex	N/A	Type 5 simplex	N/A
Dimension® PBX	Same site	E&M type 1 compatible	Unprotected	E&M type 1 standard	Unprotected
Dimension PBX	Interbuilding	E&M type 1 compatible	Protected	E&M type 1 standard	Protected
Other	Same site	E&M type 1 compatible	Unprotected	E&M type 1 standard	Unprotected
Other	Interbuilding	E&M type 1 compatible	Protected	E&M type 1 standard	Requires a protection unit
Network Interface		E&M type 1 standard	Unprotected	N/A	N/A

Modes of Operation

The system can be programmed to operate in any one of three modes:

■ Key

■ Hybrid/PBX

■ Behind Switch

The mode of operation determines

■ the types of outside lines/trunks that can be connected to the system

■ how outside line/trunks are provided to users

■ the types of system operator consoles allowed

■ the features available and how they work

Table 4-2 at the end of this section summarizes the system's modes of operation.

Key Mode

A Key system is the simplest way to provide users with more than one line from a single telephone. Older Key systems have telephones that look like single-line telephones except for a row of buttons, illuminated by incandescent lights when active, across the bottom. The leftmost button is labeled "Hold," and the other buttons are labeled with telephone numbers.

When the system operates in the Key mode, specific telephone company lines are associated with specific line buttons (or keys) on each telephone. The line buttons allow users to see activity on other telephones, join conversations, make calls, or receive calls. Separate Intercom buttons are used to make and receive internal calls.

The Key mode accommodates any one, or a combination, of the following kinds of lines and facilities (DID trunks cannot be used on Key systems):

■ loop/start including basic lines, WATS, and FX

■ tie trunks

■ DS1 facility

■ Emulated ground-start lines

A standard Key system's lines are all loop-start. Loop-start connections introduce a slight delay from the time the telephone company's central office recognizes a call attempt and the time the call is processed. This delay is minimal and virtually unnoticeable. Most residence and small business telephones have loop-start lines.

Ground-start lines can be used on a Key system only by designating channels on a 100D module as ground-start lines. These are called emulated ground-start lines. No ground-start lines from the telephone company can be directly connected to a control unit registered as a Key system (FCC "KF" classification).

The following features are not available on a Key system:

■ trunk pools

■ Automatic Route Selection (ARS)

■ queued call consoles (QCCs) and associated features

■ System Access buttons

Line Access

In the Key mode, each outside line must be assigned to a line button on at least one telephone. Because of this, multibutton telephones are the most common telephones used in the Key mode (see Figure 4-2).
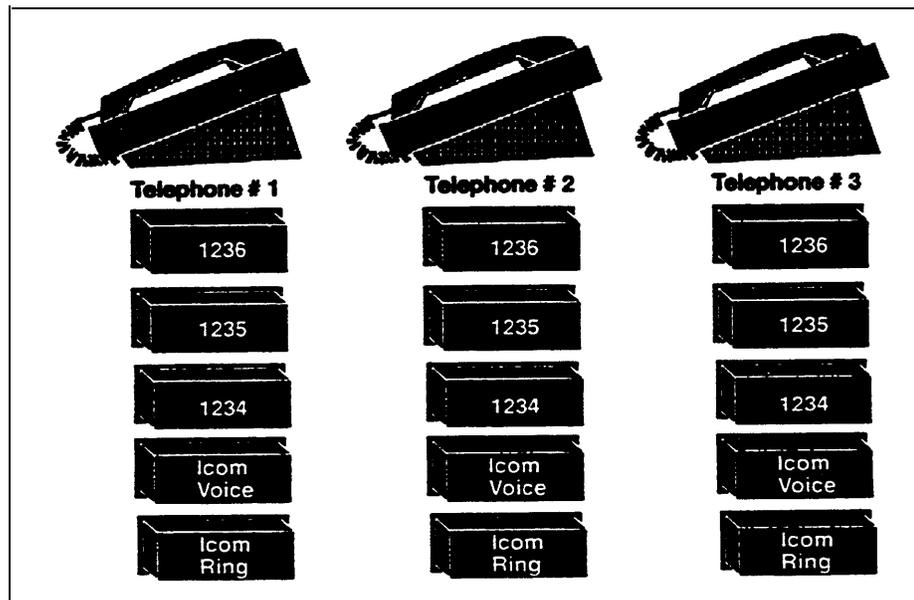
Figure 4-2   Lines Labeled for Key System Telephones

A user selects an outside line by pressing one of the line buttons labeled with a telephone number (Personal Line button). Upon hearing a dial tone, the user can dial out. When a line is in use, the green light emitting diode (LED) goes on next to the corresponding Personal Line button on all telephones that share the personal line.

The telephones in a Key system also have intercom buttons (labeled as ICOM) that allow users to call other people connected to the system. An inside talk path is provided when an intercom button is pressed. The dial tone that the user hears can be programmed as an inside (the factory setting) or outside dial tone.

The following types of Intercom buttons can be used to make and receive inside calls in the Key mode:

■ **Intercom Ring** button is used to make inside calls and to receive inside calls and outside calls transferred by another user. When an Intercom Ring button is used to make an inside call, the call rings with a one-burst ring to indicate an inside call.

■ **Intercom Voice** button is used to make inside calls and to receive inside calls and outside calls transferred by another user. When an Intercom Voice button is used to make an inside call, the person being called hears the caller's voice instead of hearing the telephone ring unless the person being called does not have a speakerphone or has disabled voice announcements.

■ **Intercom Originate Only** button is used to make inside calls. Calls are not received on an Intercom Originate Only button. The purpose of the button is to ensure that the user always has a button available to make a call, transfer a call, establish conference calls, answer Call Waiting calls, or pick up parked calls. The button can be programmed for either voice or ring operation.

A combination of up to 10 Intercom Voice, Intercom Ring, and/or Intercom Outgoing Only buttons can be assigned to each telephone (excluding QCC system operator positions). The number of Personal Line buttons that can be assigned to a telephone is limited only by the number of lines allowed in the system and the number of buttons available on the telephone.

Kinds of Key Systems

There are three kinds of Key systems:

■ square Key system

■ modified Key system

■ hybrid Key system

Square Key System

In a square Key system, all telephones access the same outside lines. Every outside line connected to the system is assigned to the same line button on every telephone.

The factory setting for Key mode automatically assigns the first eight lines connected to the system to all multiline telephones and assigns all lines connected to the system to direct-line consoles (DLCs).

For example, Figure 4-2 shows a square Key system in an office with three outside lines and three telephones. Each of the three outside lines is assigned to the same button on each telephone. When an outside line is assigned to a line button on more than one telephone, it is considered a shared line.

Modified Key System

A square Key system can be modified through system programming to provide line access for special business needs. For example, because in many offices not every user needs a tie trunk, the system is programmed so that not all telephones have access to all lines.

The labeled line buttons for a modified Key system with two outside lines and one tie trunk are shown in figure 4-3.
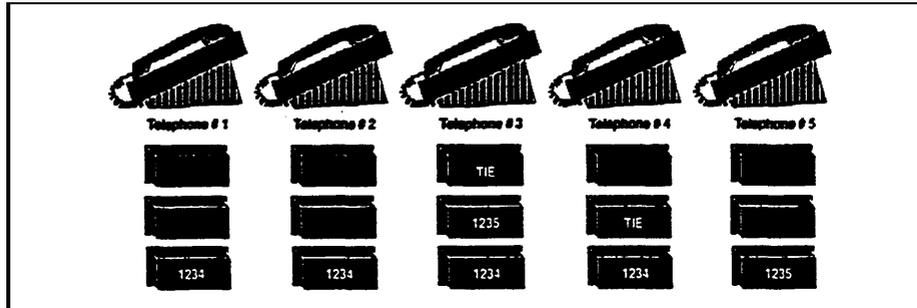
Figure 4-3   Lines Labeled for Modified Key System Telephones

Hybrid Key System

A hybrid key system is a composite of the Key and Hybrid/PBX modes of operation. For the Key system, whether standard or modified, this allows ground-start lines to be connected directly to the control unit.

To have ground-start lines in a hybrid Key system, the system must be registered under an MF classification and the control unit must be modified to allow programming of ground-start lines. Then the system can be programmed for the Key mode. In the Key mode, all outside lines, including ground-start lines, are assigned to line buttons on each telephone.

FCC Registration   The AT&T account representative or authorized dealer who planned the system's mode of operation provides the FCC registration number that the customer reports to the local telephone company. In Key systems this number includes the letters "KF" or "MF". The guidelines used to determine the system's classification are as follows.

KF Classification

The system is registered under the KF classification in the following cases:

■ All outside lines terminate on one or more telephones.

■ All outside lines to the system are loop-start, tie, or a DS1 facility (or any combination).

■ Pooled facilities are not permitted.

Systems that qualify as Key mode for the FCC are modified during installation to set the "KF option" (or "strap"), which prohibits the assignment of ground-start lines. The FCC registration number for this type of system is AS593M-72914-KF-E.

MF Classification

The system is registered under the MF classification if any ground-start lines (coming directly from the telephone company) are connected to a 400 GS/LS/TTR, 408 GS/LS, or 800 GS/LS module.

The control unit for these hybrid Key systems does not include the KF option. The FCC registration number for this type of system is AS593M-72682-MF-E.

Key System Considerations   Operating the system in the Key mode has several advantages:

■ The multibutton telephones most commonly used in a Key system provide easy access to outside lines. To get a dial tone, the user simply lifts the handset and an outside line is automatically selected.

■ The intercom path helps ensure that outside lines are available when needed.

■ Key mode has the flexibility to provide line access according to user needs. For example, tie trunks can be terminated on the telephones of only those users who need them.

■ The loop-start lines traditionally associated with Key mode can cost less than the lines used in the other modes.

If the system is registered under an MF classification, any of the three modes (Key, Hybrid/PBX, or Behind Switch) can be chosen, depending on the number of telephones and number of lines that each user can access.

■ Key systems are best suited to smaller businesses.

■ To take advantage of the features and functionality of the system, all users should have multibutton telephones. However, multibutton telephones are more costly than single-line telephones.

■ If the number of lines connected to the system is larger than the number of buttons available on the DLC, the Hybrid/PBX mode, which offers QCC, may be more functional.

■ To make more efficient use of outside lines connected to the system by grouping them into pools for shared use, or to get the ARS feature, the Hybrid/PBX mode must be used.

Hybrid/PBX Mode

A PBX (private branch exchange) originally was a large switchboard installed at a customer's office that functioned like a small, self-contained telephone company.

The switchboard was manually operated, and the system operators had to physically connect calls by plugging cords into the board's jacks. Today's PBX is a processor in the system's control unit programmed to connect both inside and outside calls on a single button. In the Hybrid/PBX mode, this button is called a System Access button (labeled as SA).

Although there is no longer a person handling cords, the communications system operating as a PBX still requires the user to request a line. A user simply dials a dial-out code (usually a 9) and the telephone number on a System Access button, and the system routes the call to an available outside line.

The major distinction of the Hybrid/PBX mode, therefore, is that both inside and outside calls can be made from the same button.

In the Hybrid/PBX mode, the telephone company's lines connected to the control unit are called "trunks." The Hybrid/PBX mode can accommodate any one, or a combination, of these trunks:

■ loop-start (basic lines, WATS, FX)

■ ground-start (basic lines, WATS, FX)

■ tie

■ DID

■ DS1 Facility

In the Hybrid/PBX mode, the system has the capacity to hold 11 separate trunk pools. The number of pools programmed in the system depends on both the kinds of trunks and the special needs of the users.

To program the Hybrid/PBX mode, the Hybrid/PBX choice on the system programming menu is selected. Choosing Hybrid/PBX automatically arranges the outside trunks in functional groups, or pools, within the control unit (see Figure 4-4).

Since the outside trunks are pooled, outside numbers are not associated with individual telephones. When a pool is assigned to a line button during system programming, it is called a pool button. Users request specific trunk pools by dialing the dial-out code (usually a 9) for the pool or pressing a pool button, which gives on-touch access to a group of trunks.
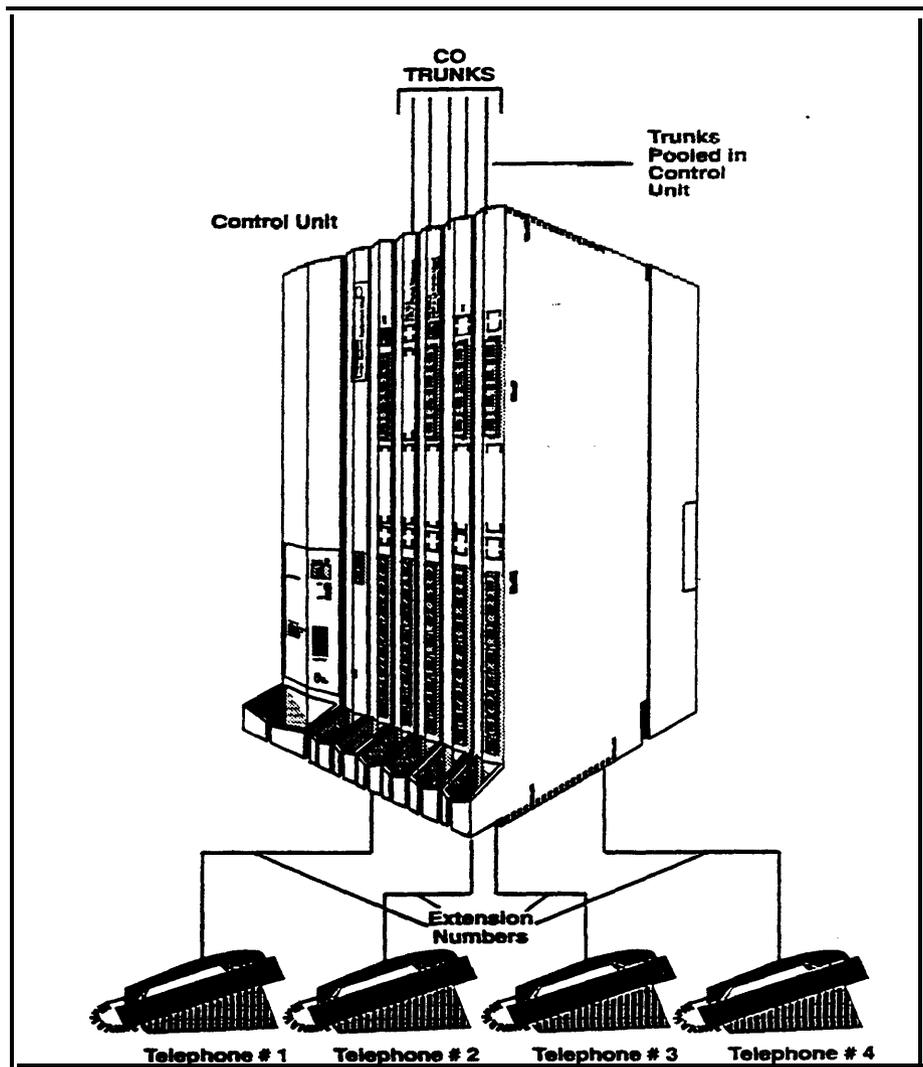
Figure 4-4   Hybrid/PBX Mode of Operation

Outside calls are normally answered by a system operator and transferred to
individual system users. A feature commonly used with pools is Automatic Route
Selection (ARS).

When a System Access button is used to make an outside call and the ARS dial-
out code (usually a 9) is entered, the system

■ selects the next available trunk from the type of pool best suited for the call

■ assigns it to the user's telephone for that call

Without additional programming, the system provides three types of trunk pools The system's trunks are automatically assigned to the corresponding trunk type pool. The three automatic trunk pools are

■ loop-start pool (also called the main pool); the factory-assigned pool number is 70.

■ ground-start Pool; the factory-assigned pool number is 890.

■ tie pool; the factory-assigned pool number is 891.

Through system programming, the three automatic pools can be rearranged and special-function or special-user pools can be created. For example, the main pool can be divided and smaller pools of loop-start trunks can be assigned to different groups of users.

Line Access

Both single-line and multiline telephones are appropriate to the Hybrid/PBX mode. In fact, the most flexible use of the single-line telephone is in the Hybrid/PBX mode.

To make an outside call, the single-line user dials pool access or ARS dial-out codes, and the system automatically selects an outside line. In addition, System Access buttons on multiline telephones allow different kinds of calls to be made from the same button (WATS or tie-trunk calls, routine outside calls, and internal calls).

Besides System Access buttons, other types of line buttons can be assigned to multiline telephone users. A telephone can have more than one of the same kind of button or a mixture of buttons with the capabilities offered by the following types of buttons:

■ **System Access Ring** buttons are used to make and receive inside and outside calls. When a System Access Ring button is used to make an inside call, the call rings with a one-burst ring to indicate an inside call.

■ **System Acess Voice** buttons are used to make and receive inside and outside calls. When a System Access Voice button is used to make an inside call, the person being called hears the caller's voice instead of hearing the telephone ring unless the person being called does not have a speakerphone or has disabled voice announcements.

■ **System Access Originate Only** buttons are used to make inside and outside calls. Calls are not received on a System Access Originate Only button. The purpose of the button is to ensure that the user always has a button available to make a call, transfer a call, establish conference calls, answer Call Waiting calls, or pick up parked calls. For inside calls, the button can be programmed for either voice or ring operation.

■ **Shared System Access** buttons are used to allow two or more users to answer each other's calls, join conversations, or make or receive inside or outside calls on each other's System Access Voice or System Access Ring buttons. In a Shared System Access arrangement, the principal (or primary) station is the telephone from which specific System Access buttons (Ring, Voice, or Originate Only) are being assigned as Shared System Access buttons on one or more telephones.

Shared System Access buttons are often provided to secretaries and their bosses, as well as to others who work closely together, such as a customer service department. For inside calls, the button can be programmed for either voice or ring operation.

■ **Pool** buttons are used to make outside calls using a specific trunk pool. To make an outside call, the user presses the appropriate Pool button-no dial-out code is necessary.

■ **Personal line** buttons are used to dedicate an outside trunk for use by one or more telephones in the system. The Personal Line button is used to make and receive only outside calls. To make a call, the user dials the area code and telephone number—no dial-out code is necessary.

A combination of up to ten System Access Voice, System Access Ring, System Access Outgoing Only and/or Shared System Access buttons can be assigned to each telephone (excluding QCC system operator positions). The number of Personal Line or Pool buttons that can be assigned to a telephone is limited only by the number of lines or pools allowed in the system and the number of buttons available on the telephone.

Queued Call Console

The type of system operator position typically used in the Hybrid/PBX mode is the queued call console (QCC), which allows calls to come to the system operator one at a time. This is especially useful when the number of outside lines connected to the control unit exceeds the number of buttons available on a direct-line console (DLC).

A call is held in queue until the system operator is available. After the call is delivered to a "Call" button on the console, the operator transfers the call to the desired internal destination. The operator can switch between the caller and the called person to screen calls.

FCC Registration

The AT&T account representative or authorized dealer who planned the system's mode of operation provides the FCC registration number that the customer reports to the local telephone company. For Hybrid/PBX mode this number includes the letters "MF." The guidelines used to determine the system's classification are as follows.

MF Classification

The system is registered under the MF classification in either of these cases:

■ There are no directly terminated trunks (all the trunks in the system are pooled).

■ The only directly terminated trunks are personal, not shared, lines—that is, only one telephone accesses the trunk.

The registration number for this type of system is AS593M-72682-MF-E.

Hybrid/PBX Considerations	Operating in the HybridPBX mode offers several advantages:

■ Hybrid/PBX trunks are the most efficient use of outside trunks since they can be pooled and are more readily available to users. The ARS feature can be programmed for more cost-effective use of pools.

Cost-effective single-line telephones can be used for greater functionality than is possible in other modes. Both inside and outside calls can be made by accessing a pool of trunks.

■ The QCC ensures efficient call handling and is particularly useful when the number of lines exceeds the number of buttons available on a DLC system operator position.

Behind Switch Mode

The system operates in the Behind Switch mode when the control unit is connected to (is "behind") another communications system. This other system is called the host, and can be either a PBX or a Centrex (a telephone company service that works like a PBX but is housed at a telephone company's central office).

Figure 4-5 shows a very simple Behind Switch setup in which the outside trunks come into the host system.

The lines connecting the two control units are like extension numbers that allow users to access the pool of outside lines connected to the host system. Each extension number from the host system is assigned to individual telephones as a Prime Line. This line rings immediately when the user receives an outside call and the user is connected to this line (even when it is busy) unless the user manually selects a different line.

Each Prime Line can be assigned to additional telephones as secondary lines to allow users to see activity on other telephones sharing the button (using the LEDs next to the button) and join their co-worker's conversations.

In addition, Prime Lines are automatically assigned to direct-line console (DLC) system operator positions. The first line assigned is the system operator's Prime Line and the rest are assigned as secondary lines. This allows the system operator to answer calls received by other users on their Prime Line.
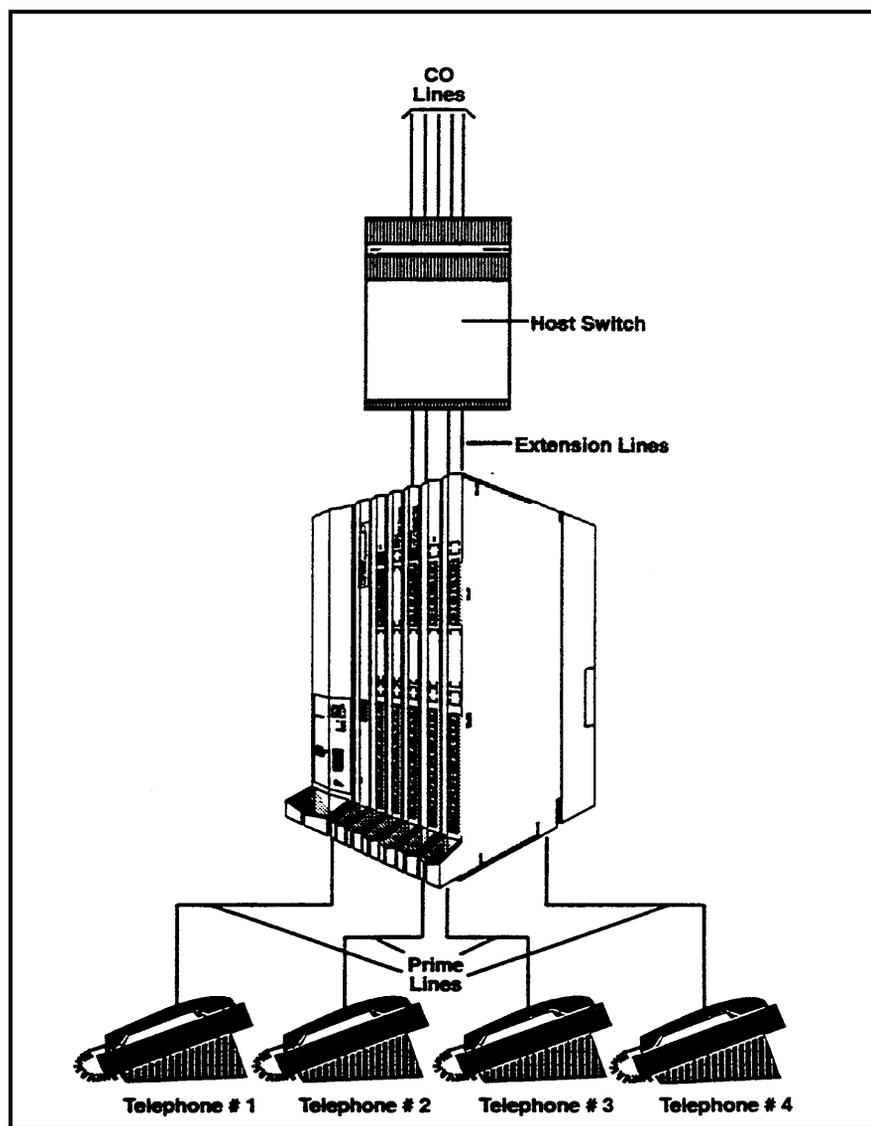
Figure 4-5   Behind Switch Mode

Modifications   In addition to accessing the pool of outside lines in the host switch, the system can be modified to bypass the host switch and provide direct access to outside lines—for example, to connect WATS lines directly to the control unit so that they are available only for users in the Behind Switch mode (see Figure 4-6).
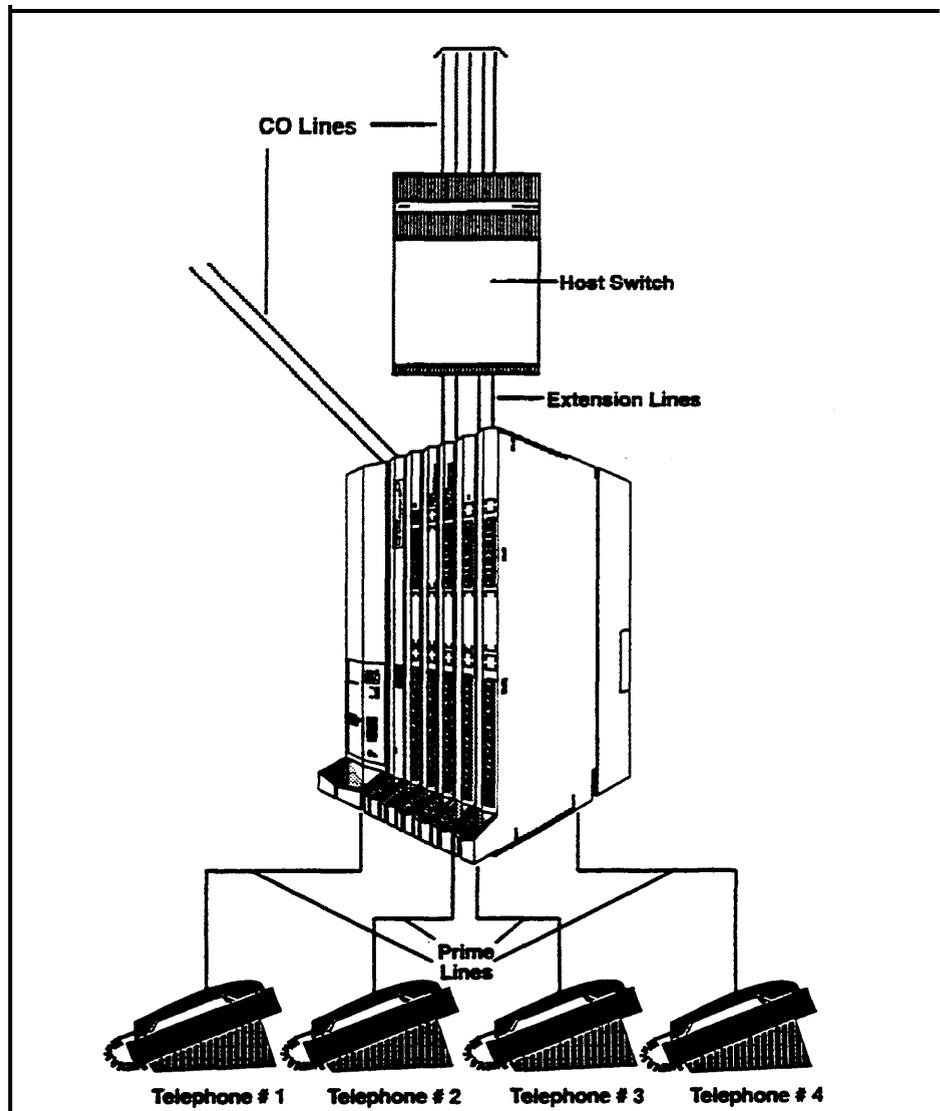
Figure 4-6   Behind Switch Mode with Direct Outside Lines

Depending on business needs, any one (or a combination) of the following direct outside lines can be added:

■ loop-start (basic, WATS, FX)

■ tie trunks

■ DS1 facility

The direct outside lines must be terminated on individual telephones and must appear on the telephones' line buttons. For example, if the tie trunks are assigned to buttons on telephones 1 and 2, the buttons on those telephones appear as shown in Figure 4-7.
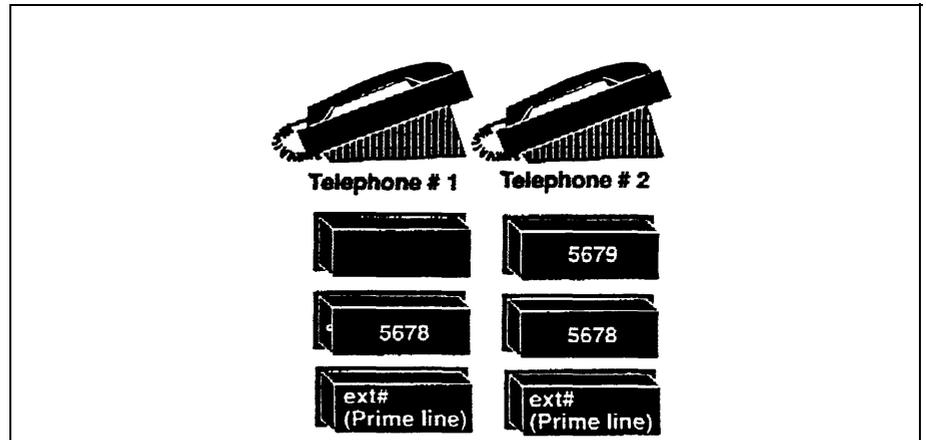
Figure 4-7   Labeled Line Buttons for Behind Switch Telephones

The bottom button on each telephone is reserved for the Prime Line coming
from the host system. The outside lines appear on the labeled line buttons
above the Prime Line. In this figure, the first line (5678) is assigned to buttons on
both telephones, and the second (5679) is assigned to a button only on the
second telephone.

The following features are not available on a Behind Switch system:

■ trunk   pools

■ Automatic Route Selection (ARS)

■ queued call consoles (QCCs) and associated features

■ System Access buttons

Line Access

Multibutton telephones are most commonly used in Behind Switch mode. Single-
line telephones can also be used and can be setup in two ways. In the first way,
the user has constant access to the Prime Line but cannot make intercom calls
or use system features. In the second way, the user can make and receive
intercom and Prime Line calls and can use system features, but the user must
dial a dial-out code to make an outside call.

When the Behind Switch mode is chosen in system programming, the system
assigns a single Prime Line and an Intercom Voice and Intercom Ring button to
each telephone. When a user lifts a handset, the Prime Line is automatically
selected (even when it is busy) unless the user selects a different button before
lifting the receiver. The Prime Line connects only with the host system, not an
outside line.

To call another person connected to the host system, the user dials the host
system extension number assigned to that person. To access outside lines, the
user dials the host system's dial-out code (usually a 9), and the host system
selects an available outside line from its pool.

Modes of Operation **4-19**

In a Behind Switch system the Intercom buttons on the telephones allow users to call other people connected to the system. When an Intercom button is pressed, the system provides an inside talk path and dial tone from the Behind Switch system (not the host system). Users can then reach co-workers without interfering with the use of Prime lines.

The following types of Intercom buttons can be used to make and receive inside calls in the Behind Switch mode:

■ **Intercom Ring** button is used to make inside calls and to receive inside calls and outside calls transferred by another user. When an Intercom Ring button is used to make an inside call, the call rings with a one-burst ring to indicate an inside call.

■ **Intercom Voice** button is used to make inside calls and to receive inside calls and outside calls transferred by another user. When an Intercom Voice button is used to make an inside call, the person being called hears the caller's voice instead of hearing the telephone ring unless the person being called does not have a speakerphone or has disabled voice announcements.

■ **Intercom Originate Only** button is used to make inside calls. Calls are not received on an Intercom Originate Only button. The purpose of the button is to ensure that the user always has a button available to make a call, transfer a call, establish conference calls, answer Call Waiting calls, or pickup parked calls. The button can be programmed for either voice or ring operation.

A combination of up to ten Intercom Voice, Intercom Ring , and/or Intercom Outgoing Only buttons can be assigned to each telephone (excluding QCC system operator positions). The number of Personal Line buttons that can be assigned to a telephone is limited only by the number of lines allowed in the system and the number of buttons available on the telephone.

In the Behind Switch mode, users can use the special features of both the Behind Switch and host systems. When both systems have common features, the customer must decide which system will be used for those features. Each system must be programmed accordingly, and the users must be given the appropriate access instructions.

In addition, when users press the Conference, Drop, and Transfer buttons, the respective host system features are activated and a timed flash is sent to the host system, followed by a programmed feature access code. (Whoever is programming the system must obtain the feature access code for the host system and program it to the Conference, Drop, and Transfer buttons.)

Hybrid Behind Switch Mode

A Hybrid Behind Switch system combines the features of the Behind Switch system with the ground-start capabilities of a Hybrid/PBX system. If a ground-start line is directly connected to the control unit, the FCC considers the system a hybrid.

FCC Registration

The FCC has no Behind Switch classification, so the system is registered under the FCC category it parallels-either KF (a Key system) or MF (a hybrid system).

The AT&T account representative or authorized dealer who planned the system's mode of operation provides the FCC registration number that the customer reports to the local telephone company. This number includes the letters "KF" or "MF" The guidelines used to determine the system's classification are as follows.

KF Classification

The system is registered under the KF classification in each of the following cases:

■ No outside lines are connected directly to the control unit (all outside lines feed the host system's main switch, and the system accesses that switch's pool).

■ Outside lines are connected directly into the control unit and are assigned to buttons on one or more telephones.

■ Outside lines are connected directly to the control unit, and none of these lines is a ground-start line.

■ No pooled trunks are used.

Systems that qualify as Behind Switch mode for the FCC are modified during installation to set the "KF option" (or "strap"), which prohibits the assignment of ground-start lines. The FCC registration number for this type of system is AS593M-72914-KF-E.

MF Classification

The system is registered under the MF classification if all outside lines connected directly to the control unit are ground-start lines.

The processor module in systems that qualify as Key mode for the FCC must be modified during installation to set the "KF option," which prohibits the assignment of ground-start lines. The FCC registration number for this type of system is AS593M-72682-MF-E.

Behind Switch Considerations

Operating the system in the Behind Switch mode is appropriate for users who are part of a large organization. For example, a department might not want (or be able) to support a large-capacity PBX. Piggy-backing the system behind the host switch, however, gives the advantage of the host's features and functions.

Single-line telephones can be setup in two ways in Behind Switch mode. In the first way, the user has constant access to the Prime Line but cannot make intercom calls or use system features. In the second way, the user can make and receive intercom and Prime Line calls and can use system features, but the user must dial a dial-out code to make an outside call.

Businesses served by Centrex that have many locations can have the individual locations connected in Behind Switch mode to the Centrex.

Modes of Operation **4-21**

Table 4-2 Summary of Modes of Operation

	Key	Hybrid/PBX	Behind Switch
Single-line telephones	Yes	Most useful	Yes
Multibutton telephones	Most useful	Yes	Yes
Lines connected directly to control unit:			
■ ground-start line (trunk)			
KF registration number	No	No	No
MF registration number	Yes	Yes	Yes
■ loop-start line (trunk)	Yes	Yes	Yes
■ ISDN-PRI	Yes	Yes	Yes
■ DS1	Yes	Yes	Yes
■ Tie trunk	Yes	Yes	Yes
■ FX	Yes	Yes	Yes
■ WATS	Yes	Yes	Yes
■ DID	No	Yes	No
Trunk pools	No	Yes	No
ARS	No	Yes	No
Intercom buttons	Yes	No	Yes
System Access buttons	No	Yes	No
Outside lines assigned to buttons on telephone	Yes	Yes	Yes
Shared lines	Yes (outside lines)	Yes (outside lines and System Access buttons)	Yes (outside lines)
Prime Lines	No	No	Yes
Number of stations:			
■ Up to 50	Good	Good	Good
■ 50 to 100	Not recommended	Good	Good up to 80 stations
■ 100 +	Not recommended	Good	Not recommended
FCC registration	KF or MF	MF	KF or MF

Lines/Trunks

This section describes the functioning of the lines/trunks in the system.

Loop-Start Line/Trunks

Loop-start lines/trunks are the standard for home and small business Key systems. They are less expensive in some areas but have certain limitations:

■ They do not protect against glare. (Glare occurs when a person tries to make an outside call on a line/trunk at the same time an incoming call is being received on that line/trunk.)

■ They can have higher cable losses and, therefore, transmissions of less quality than ground-start lines/trunks.

■ They cannot assure secure toll restriction.

Ground-Start Lines/Trunks

Ground-start lines/trunks are outside lines/trunks used by some businesses (such as hotels or motels) where improved signaling is important. The improved signaling of ground-start allows more secure toll restriction.

In addition, ground-start lines/trunks prevent glare. Ground-start lines/trunks also provide cable losses ≤ 4.5 dB.

The following types of outside lines/trunks can be either ground-start or loop-start

■ basic lines/trunks (used for both local and long-distance calls)

■ WATS (wide area telecommunications service)

■ 800 service (In-WATS)

■ foreign exchange (FX)

Tie Trunks

Tie trunks provide private communication between two systems. Tie trunks "tie" the two systems together, making it seem that all the telephones are on the same system.

Tie trunks provide efficient communication between systems at different locations. These locations can be different floors of the same building, different buildings in the same campus, or different cities or states.

Tie trunks can be added to the system via the 400EM module. The 400EM module has four ports that must be programmed individually by selecting trunk options via system programming and setting the DIP switches (located on the front of the module) for E & M protected, E & M unprotected, or simplex signaling mode.

The following tie-trunk options need to be programmed via system programming:

■ **E&M Signaling Type**

   ■ Type 1 standard (the factory setting) — used when tie trunks are connected to the other system through the local telephone company.

   ■ Type 1 compatible — used when tie trunks are connected directly to a system that uses type IS signaling and is located near this system.

   ■ Type 5 — used when tie trunks are connected directly to a system that uses type 5 signaling and is located near this system.

■ **Direction**

   ■ Two-way (factory setting) — Calls can be made in either direction.

   ■ Outgoing only — Calls can be dialed but not received (no ringing).

   ■ Incoming only — Calls can be received but not dialed (no dialing).

■ **Dial Mode**

   ■ Rotary (factory setting)

   ■ Touch-tone

   Note: If the 400EM module is programmed for touch-tone dialing and there are no modules in the system that provide TTRs (012, 008 OPT, 400 LS/TTR, 400 GS/LS/TTR or 800 DID), a 400 GS/LS/TTR module must be installed.

■ **Dial Tone** determines whether the dial tone originates from the remote or local end of the line:

   ■ Remote (factory setting) — The system sends a dial tone to the remote end.

   ■ Local — The system does not send a dial tone to the remote end.

■ **Answer Supervision Time** sets a time limit in milliseconds (ms) for the remote station to signal the calling station:

   ■ 300 ms (factory setting)

   ■ 20 to 4800 ms (increments of 20 ms)

■ **Disconnect Time** sets a time limit in ms for the release of the E or M lead:

   ■ 300 ms (factory setting)

   ■ 140 to 2400 ms (increments of 10 ms)

■ **Signaling Types** (also called "seizure type")

   ■ Wink (factory setting) — The originating end of the tie trunk transmits an off-hook signal and waits for the remote end to send back a signal (a wink) indicating that it is ready to receive dialing information.

   ■ Immediate — No start signal is necessary, and dialing can begin immediately after the tie trunk is seized.

■ Delay — The originating end of the tie trunk transmits an off-hook signal and waits for the remote end to send an off-hook signal followed by an on-hook signal.

■ Automatic — Incoming calls are routed directly to another station without a start signal. When the user picks up the handset, the signal rings immediately at the other end, This is also called an automatic ringdown tie trunk.

Wink, immediate, and delay types are also called dial-repeating tie trunks.

Direct Inward Dial Trunks

Direct Inward dialing (DID) trunks allow incoming calls to reach specific individuals or facilities in the system without the assistance of a system operator. DID trunks are available only in the Hybrid/PBX modes. They are connected to the system on an 800 DID module.

With DID service, the customer reserves blocks of DID numbers from the local telephone company. The DID numbers should correspond to the extension number for an individual, a calling group, or a Remote Access or pool dial-out code.

⚠ CAUTION:

DID numbers that correspond to pool dial-out codes (or facility access codes) can be used to evade toll restriction, leading to toll abuse and/or fraud. (See "Customer Support Information" in the front of this book for more information on security.)

The system can receive 1- to 4-digit extension numbers over the DID trunks. The number of digits received on a specific DID trunk is always the same for that trunk or for the trunks in a particular DID trunk block however, different DID trunks (or trunk blocks) can receive different numbers of digits.

Because DID trunks allow calls to come directly to a telephone extension, they cannot be pooled. The telephone company's central office passes the necessary digits to the system, which delivers the call directly to the dialed extension.

If the extension numbers used in the system are fewer than four digits but the central office sends four, the system can be programmed to ignore the leading digit(s). For example, if the DID number sent by the central office is 2157, the extension numbers the system can access are 57, 157, or 2157. System programming determines the proper extension number to connect.

The system also can be programmed to match more digits than are received from the central office. For example, if the system is setup to match three digits and the central office sends the number 24, the system might insert a 9 in front of the 24 (resulting in the number 924) to complete the match and connect the call.

No routing of calls is made until the designated number of digits is received.

Incoming DID numbers that don't match a valid extension are either directed to a predesignated extension, such as the system console, or the system sends back a reorder tone.

Options are assigned to blocks of DID trunks. A maximum of two blocks off DID trunks is allowed. Each block can be configured to match the system numbering plan. For example, the system could have both 3- and 4-digit extension numbers. Trunk block 1 contains the options needed to reach the 3-digit numbers and trunk block 2 contains the options needed to reach the 4-digit numbers.

The options for each trunk group areas follows:

- **Type of DID Trunk**

    - Wink-start (factory setting) — The preferred setting if the local telephone company can support it. It allows a greater probability of call completion during heavy calling periods.

    - Immediate-start — The setting used when the local telephone company can support only immediate-start.

- **Signaling** sent from the local telephone company.

    - Rotary (factory setting)

    - Touch-tone

- **Expected Digits** sent by the local telephone company.

    - 3 (factory setting)

    - 1 to 4

- **Delete Digits.** The number of leading digits that must be deleted from the digits sent by the local telephone company when the number of digits sent is more than in the chosen system numbering plan.

    - 0 (factory setting) — Used when the number of digits sent by the telephone company matches the number of digits in the chosen system numbering plan.

    - 0 to 4

- **Add Digits.** The specific leading digits that must be added to the digits sent by the local telephone company when the number of digits sent is fewer than the number of digits in the chosen system numbering plan.

    - 0 (factory setting) — Used when the number of digits sent by the telephone company matches the number of digits in the chosen system numbering plan.

    - 1- to 4-digit number (1 to 9999)

DS1 Facilities

A Digital Signal 1 (DS1) facility is a transmission system that transports digital signals in the DS1 format. The interface that allows the connection of DS1 facilities to the system is the 100D module. Through this module, voice and data calls can be made or received using a DS1 facility.

Twenty-four digital signal 0 (DS0) channels, each operating at 64 kbps, plus framing bits, are multiplexed, forming a DS1 signal of 1.544 Mbps. Each DS0 channel within the DS1 signal corresponds to a logical endpoint. Even though there is only one physical jack, the 100D module supports up to 24 logical endpoints or ports (one for each channel).

In DS1 format, calls to other digital PBXs or telephone company central offices remain digital, and signals do not need to be converted to analog for acceptance by the connecting trunk. In addition, the 100D module can be configured to work with T1 or Integrated Services Digital Network Primary Rate Interface (ISDN-PRI) service.

To connect the 100D module to an outside DS1 facility, a channel service unit (CSU) is used. The CSU regulates the transmission into and out of the 100D module so that the module matches the transmission of the outside facility.

Both ends of the DS1 facility must be able to communicate. To ensure this, the following options are set during system programming to match the transmission of the outside DS1 facility.

■ type of service: T1 or ISDN-PRI

■ framing format

■ line code

■ line compensation

■ clock synchronization

■ signaling mode (for T1 service only)

The appropriate setting for each option is determined by the transmission facility to which the module is connected. Each option is discussed below.

Type of Service

The system supports two types of service for DS1 facilities: T1 and ISDN-PRI. The 100D module can be programmed to operate in either type of service. T1 service transmits and receives voice and analog data; ISDN-PRI transmits and receives voice, and analog and digital data.

Any combination of the following AT&T Switched Network (ASN) Services can be provided through a T1 or ISDN-PRI line/trunk

■ Megacom® WATS service for domestic long-distance outward voice calls; ISDN-PRI on the MERLIN LEGEND Communications System does not support access to international Megacom WATS service.

■ Megacom 800 for domestic toll-free incoming voice calls. ISDN-PRI on the MERLIN LEGEND Communications System does not support access to international Megacom 800 service. T1 service supports Megacom 800 with or without Dialed Number Identification Service (DNIS), while ISDN-PRI only supports it without DNIS. DNIS is a service provided by the AT&T Switch Network that routes incoming 800 or 900 calls according to customer-selected parameters, such as area code, state, or time of call. For example, a customer can specify that calls received from a particular area code should be routed to a specific individual or group responsible for accounts in the area.

■ Software Defined Network (SDN) — AT&T Switched Network (ASN) service; for voice and circuit-switched data calls (up to 56 kbps). SDN lets businesses use portions of the ASN in concert with their dedicated private line networks. However, the system does not support "uniform dialing plan," which is necessary for complete integration with SDN. ISDN-PRI on the MERLIN LEGEND Communications System does not support access to global SDN service.

■ MultiQuest for domestic toll incoming voice calls (900 number). T1 supports MultiQuest with or without DNIS, while ISDN-PRI supports only it without DNIS.

In addition to these ASN services, T1 also supports Shared Access for Switched Services (SASS). SASS allows both Megacom and Megacom 800 services to be offered over the same line/trunk facilities, eliminating the need to have separate incoming and outgoing line/trunk groups.

Like T1, ISDN-PRI also supports Megacom WATS and Megacom 800 on a shared line/trunk, but only on a call-by-call basis. Besides this, ISDN-PRI provides Accunet® switched digital service for 56-kbps, 64-kbps restricted, and 64-kbps clear circuit-switched data calls. ISDN-PRI on the MERLIN LEGEND Communications System does not support access to international Accunet services.

T1

T1 is the factory setting and is selected for the DS1 facility to allow each of the 24 channels to be programmed to emulate tie, loop-start, or ground-start lines/trunks in any combination. This means that a single 100D module can take the place of 24 regular outside lines.

If common-channel signaling is selected, 23 channels are available for emulation and the 24th channel carries formatting signals.

ISDN-PRI

ISDN-PRI is a standard format for ISDN service. Some of the benefits of ISDN-PRI service are

■ **Speed.** Data calls to outside destinations can be established on the same B channels used for voice calls if the service allows. Modems and dedicated, conditioned lines/trunks are not needed.

■ **AT&T's INFO2 automatic number identification (ANI) service.** Customers who subscribe to this service can identify the caller on an incoming call on an ISDN-PRI line/trunk by either telephone number or billing number.

Note: The availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or telephone company equipment.

■ **Dynamic B-channel assignment.** An individual B channel can be removed from service without blocking calls to or from any other B channels.

■ **Improved toll restriction.** The ways that toll restriction can be bypassed are limited on ISDN-PRI lines/trunks.

■ **Reliable indication of far-end disconnect.**

■ **Improved SMDR reports.** Call timing for SMDR reports is improved since calls recorded are closer to the actual billed duration.

Framing Format

To identify the DSO channels, the DS1 signal is segmented into blocks of 193 bits called frames. A frame consists of 24 eight-bit words (one for each channel) plus a framing bit at the beginning of each frame: 24 words x 8 bits = 192 bits. Thus, a framing bit appears in every 193rd bit position of the 1.544-Mbps DS1 signal.

Frames repeat at a rate of 8000 per second, with each frame repeating DS0 channels 1 through 24 sequentially.

Two methods of framing can be used by a 100D module, but the framing method chosen must match the framing at the far end.

■ **D4 Framing Format.** The system is factory set for the most common framing format, D4 framing. A D4 frame consists of 24 eight-bit time slots and one framing bit. To perform synchronization, the receiving equipment uses the framing information to identify the start of each frame and to identify which frames contain signaling information. The framing information repeats once every 12 frames; these 12 frames form the D4 superframe. This framing format is used by most DS1 equipment.

■ **ESF Framing Format.** The extended superframe (ESF) format extends the 12-frame D4 superframe to a 24-frame superframe, hence its name. The 24 framing bits include a cyclic redundancy check (CRC) for the entire extended superframe and a facility data link for maintenance. The ESF can detect more errors than D4 framing; however, ESF is not used universally by DS1 equipment.

Line Coding

The DS1 signal consists of a continuous bit stream of ones and zeros, encoded into bipolar pulses for transmission. Only the ones create a pulse; the zeros represent the absence of a pulse. The pulses of the ones alternate between positive and negative. This type of line coding is called bipolar or alternate mark inversion (AMI). The line-coding formats guarantee that the "ones-density" requirement is met to achieve clock recovery.

To meet the ones-density requirement, either zero code suppression (ZCS) or bipolar 8 zero substitution (B8ZS) line coding can be chosen.

ZCS

ZCS line coding monitors each DS0 channel and prevents strings of eight or more zeros. Upon detecting eight consecutive zeros in a channel octet, ZCS line coding forcibly changes the seventh zero (second least significant bit) to a one. The factory-set line coding is ZCS.

With ZCS line coding, any bit that is overwritten has no noticeable effect on voice and voice-grade data. However, the ZCS line-coding format can cause errors in digital data transmission.

B8ZS

B8ZS line coding encodes an all-zero channel octet into a unique binary sequence with a "bipolar violation" in bit positions 4 and 7. Normally for bipolar transmission, ones are encoded alternately as a positive then negative, or negative then positive, pulse. if two positive or two negative pulses are received in succession, a bipolar violation occurs.

Ordinarily, bipolar violations are caused by noise hits to the signal. However, B8ZS line coding allows the 8-bit strings to be detected at the receiving end and converted back into the original sequence.

B8ZS line coding is preferred over ZCS because it does not cause errors in data transmission.

B8ZS violations are passed by the ESF T1 Channel Service Unit (CSU) but not by other CSUs. The CSU is a hardware component needed when two endpoints are located in different buildings or when the distance between the two endpoints makes office or line repeaters necessary. The CSU is located on the customer's premises and is used to connect the system to DS1 network facilities (see "Channel Service Unit" in Chapter 5, "Hardware"). The CSU has three functions:

■ It terminates an outside DS1 facility on the 100D module.

■ It ensures that the signals entering the public network comply with the requirements of the DS1 facility as specified by the FCC.

■ It includes maintenance, diagnostic, and testing capabilities.

Line Compensation

Line compensation adjusts for the amount of cable loss in decibels (dBs), based on the length of cable between the 100D module and the CSU or other far-end connection point. The factory setting is a value of 1, which allows a maximum loss of 0.6 dB. The other possible settings are shown in Table 4-3.

Table 4-3   Line Compensation Settings

Setting	dB Loss	Cable Feet (22-Gauge Wire)
1	-0.6	0 – 133
2	-1.2	133 – 266
3	-1.8	266 – 399
4	-2.4	399 – 533
5	-3.0	533 – 655

Clock Synchronization

Clock synchronization is an arrangement where digital facilities operate from a common clock. Whenever digital signals are transmitted over a communications link, the receiving end must be synchronized with the transmitting end to receive the digital signals without errors.

The system synchronizes itself to the network by extracting the timing signal from the incoming digital stream. If the system has more than one 100D module, the module that provides the primary synchronization for the other 100D modules and for the TDM bus must be identified during system programming. The factory setting is the first 100D module in the carrier. This can be changed to the second or third module.

Backup synchronization in the event of a maintenance failure can be provided by programming the second and third installed modules as secondary and tertiary synchronization.

In addition, the source of synchronization can be factory set to "loop clock reference source" (the clock is synchronized to the external endpoint—the factory setting) or set to "local clock reference source" (the clock is free running). This setting must be made for the primary, secondary, and tertiary synchronization modules.

Signaling Mode

Signaling is the process of communicating channel-state information (such as dialing) from endpoint to endpoint. Two types of signaling can be used in T1 transmission: robbed-bit signaling (RBS) and common-channel signaling (CCS).

Choosing a signaling mode pertains only to T1 service; ISDN-PRI always uses common channel signaling (23 B channels and 1 D channel).

Robbed-Bit Signaling

RBS replaces ("robs") the least significant bit of every sixth frame of each DS0 channel with signaling information. (RBS is also called in-band signaling, since signaling information is embedded in the least significant bit of every sixth 8-bit word.)

RBS is appropriate for voice and voice-grade data (up to 1200 bps), but facilities using RBS cannot accurately transmit digital data because digital data uses high-speed data rates such as 64 kbps. Therefore, the channel is limited to voice and analog voiceband data applications.

Common-Channel Signaling

CCS is an out-of-band signaling format that places the signaling bits for channels 1 through 23 into the 8-bit word of the 24th channel. This restricts DS1 from using the 24th channel for voice or data transmissions.

D4 framing does not preclude the use of CCS, but CCS is not compatible with D4 channel banks because the D4 channel banks only recognize RBS. Coupled with B8ZS coding, CCS can support digital data up to 64 kbps per channel.

Recommended Framing Formats and Signaling Modes

ESF framing should be used to take advantage of its improved maintenance, diagnostic, and testing capabilities (the ESF T1 CSU is required to interface with the network). If the transmission between two systems is voice-only, RBS should be used for all 24 communication paths. For voice transmission, both ZCS and B8ZS line coding can be used to satisfy the ones-density requirement the preferred line-coding format is B8ZS, which is needed for 64 kbps digital data.

The framing and signaling formats depend on the network and interconnection devices (CSUs) used. For example, many CSUs only support ZCS line coding.

Notes:
- Digital data up to 64 kbps is possible only in ISDN-PRI mode. Also, ESF framing mode, CCS signaling, and B8ZS line coding are required.
- An ESF-TI CSU must be used for interbuilding DS1 connections.

System Alarms

An alarm condition detected by the system can cause the control unit to activate contact closures at a ground-start or loop-start port (administration of a loop start port is preferred). When the contacts close, a signal is passed on to a Universal Paging Access Module (UPAM) and then to an external alert. Alerting devices can be a strobe, horn, bell, or chime.

See Chapter 5. "Hardware," for more on alerting devices.

A UPAM is needed because 48-VDC alerting devices require four contact closures and the ground-start or loop-start ports only have two. The UPAM provides the additional two.

Trouble Alarm

A ground-start or loop-start power failure transfer (PFT) port can be programmed to activate an alarm by connecting the port to a UPAM (see Figure 4-8). When system trouble (software or hardware malfunction) is detected by the system operator console, a signal is sent to that port. The port's switching contacts close and send the signal onto the UPAM. The UPAM activates an external alert.

Power Failure Alarm

A ground-start or loop-start PFT port can be programmed to activate an alerting device during a power failure by connecting the port to a UPAM (see Figure 4-9). When a power failure occurs, the switching contacts on the PFT port close and send a signal to the UPAM, which activates an external alert.

Note: A PFT telephone cannot be used on this port when the port is connected for a power failure alarm

Power Failure DID Busy-Out

The PFT port on a ground-start or loop-start module can be programmed to automatically short the "busy-out" wire pair associated with a group of DID trunks. Normally a loop-start line/trunk is used as the busy-out pair. When a power failure occurs, shorting this busy-out pair signals the telephone company's central office that the DID trunks are out of service. Figure 4-10 shows this connection.

Note: Before the ground-start or loop-start module containing the PFT port for the DID busy-out is removed, the busy-out pair must be shorted and then the modular cord must be disconnected from the PFT jack. Otherwise, a false busy-out will occur. The shot is removed after the system is powered up.
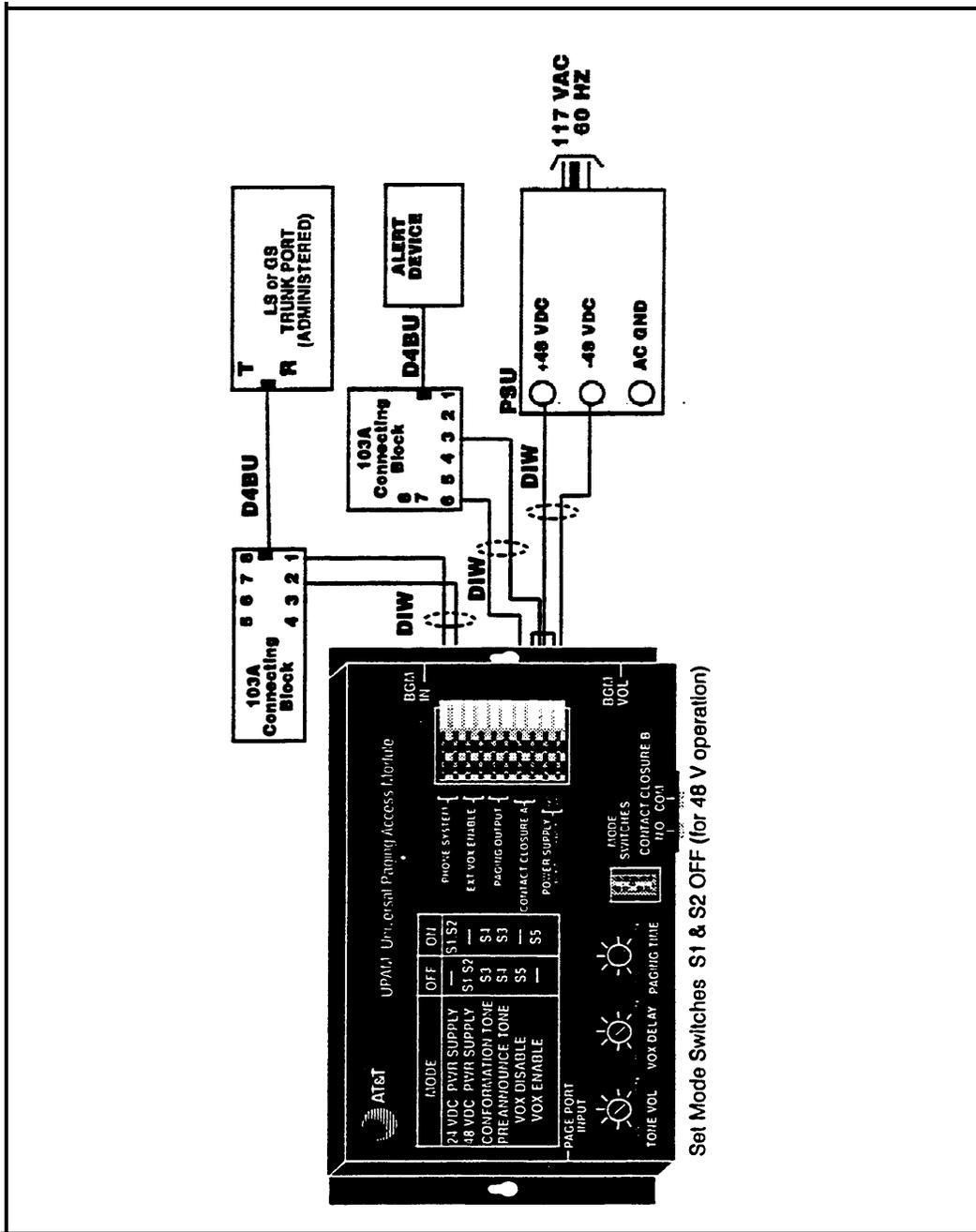
Figure 4-8   Trouble Alarm Connections
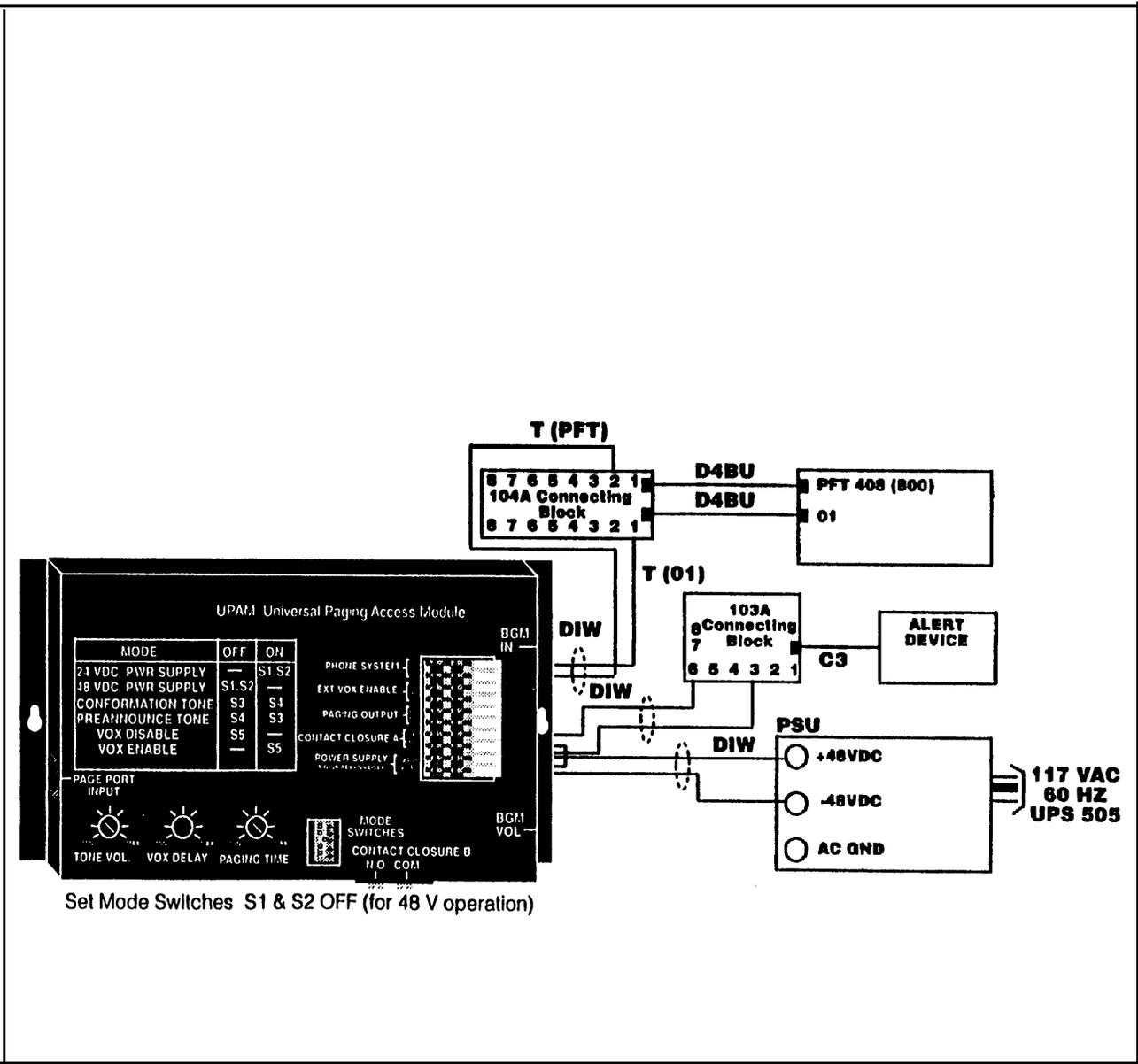
Figure 4-9   Power Failure Alarm Connections

Set Mode Switches S1 & S2 OFF (for 48 V operation)
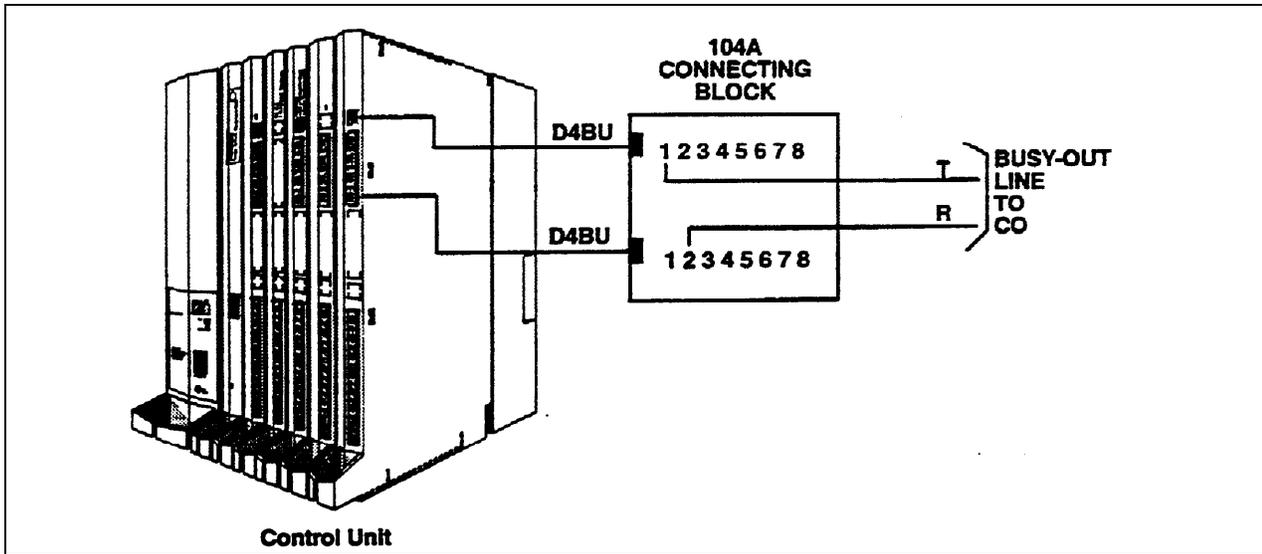
Figure 4-10   Power Failure DID Busy-Out Connections

Power Failure Transfer

A power failure transfer (PFT) telephone is a single-line telephone connected to a PFT jack on a 400, 400/GS/LS/TTR, 800, 800 GS//LS, 408, or 408 GS/LS module. In the event of a power failure, the system shuts off and the PFT telephone automatically connects to the associated outside line for making and receiving calls.

Notes:
■ The PFT jack does not operate unless a power outage occurs or the power supply units are turned off.
■ A single-line telephone connected to an MFM cannot be used as a PFT telephone.
■ If PFT telephones are to be connected to ground-start lines/trunks, a ground-start button (see figure 4-11) must be added to each PFT telephone.
■ If rotary lines/trunks are used, rotary telephones must be used as PFT telephones.
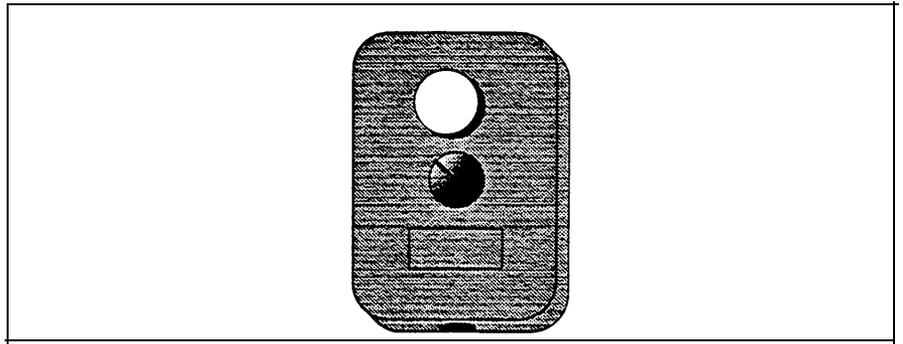
Figure 4-11   Ground-Start Button

Hardware

5

The communications system consists of required and optional hardware components:

■ required components

   ■ control unit

   ■ telephones—digital/ISDN (MLX) telephones; analog multiline telephones, including cordless telephones; and single-line telephones

■ optional components

   ■ adapters — equipment used to connect adjuncts to a multiline telephone or to the control unit

   ■ adjuncts — equipment other than telephones, such as an answering machine or a fax machine, attached either to station lines or to telephones

   ■ accessories — equipment for extra power, protection, or miscellaneous functions

   ■ applications — hardware and software providing additional functions (see Chapter 3, "System Applications")

Control Unit

The control unit connects telephone company lines with telephones and adjuncts such as answering machines and fax machines. The control unit includes the following components:

■ control unit housing

■ carriers

■ power supply module (one per carrier)

■ processor module

■ line/trunk and station modules

Control Unit Housing

The control unit is housed in a plastic cabinet for protection. The size of the housing increases as expansion carriers are added to the control unit. Figure 5-1 shows how the control unit housing fits around the control unit carrier and modules.
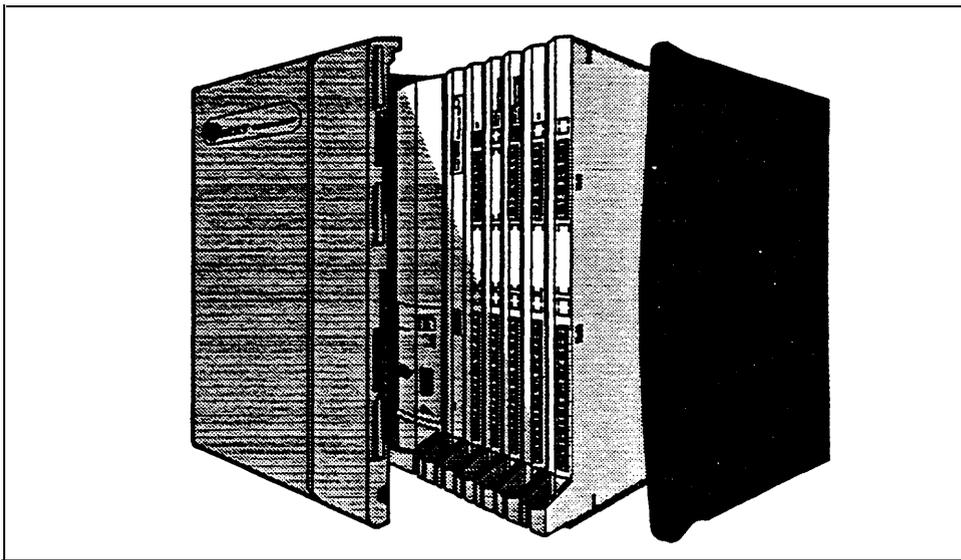
Figure 5-1   Control Unit Housing

Carriers

The basic and expansion carriers each have seven slots to hold modules (see Figure 5-2). The basic carrier contains a power supply module, the processor module (slot 00), and line/trunk and station modules (slots 01-05).

Up to two expansion carriers can be added to the right side of the basic carrier to increase the capacity of the system. Like the basic carrier, the leftmost and widest slot of the expansion carrier holds the power supply module; the remaining six slots hold the line/trunk and station modules.

Besides the slots, both basic and expansion carriers have a backplane with an input/output (I/O) bus that interfaces with the modules.
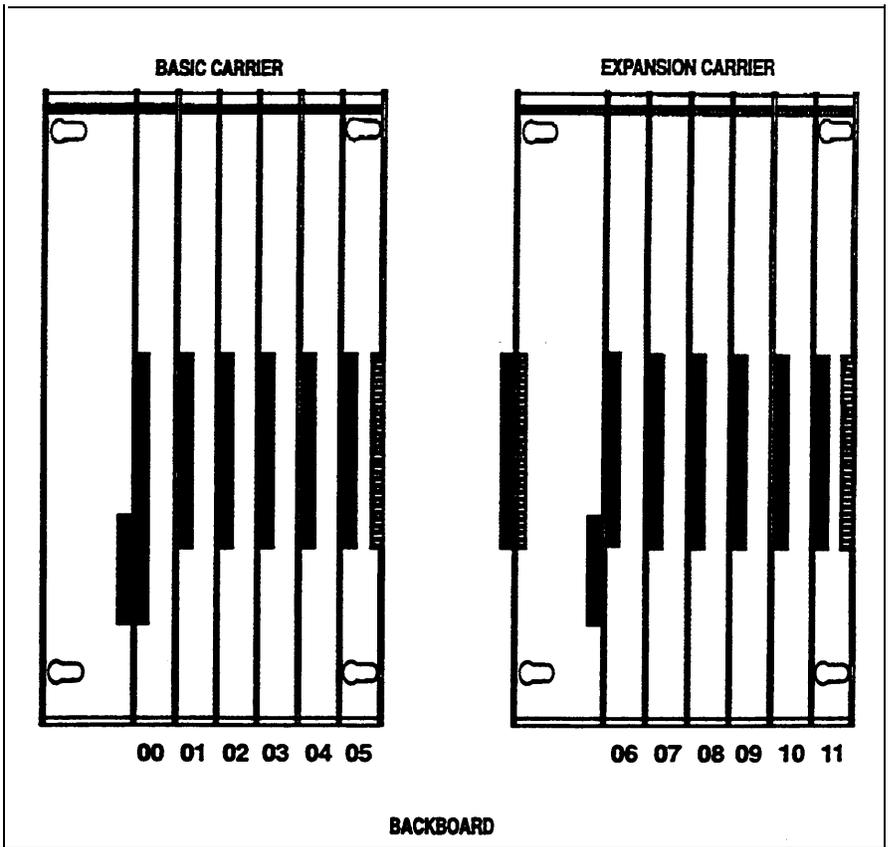
Figure 5-2   Carriers

Power Supply Module

The power supply module provides power to the carrier, to each telephone, and to adjuncts-except for adjuncts such as answering machines and fax machines, which come with their own power supplies. Each carrier requires its own power supply module, which goes into the leftmost slot on each carrier.

The power supply module converts 117-VAC line voltage to these outputs: +5 VDC, -5 VDC, and -48 VDC. All modules use +5 VDC and -5 VDC for logic and analog transmission circuits. Most line/trunk and station modules use -48 VDC for power to the stations. The direct inward dialing (DID) and off-premises telephone (OPT) line/trunk and station modules also provide -48 VDC on the tip/ring (T/R) interface to the telephone company's central office or OPT station. The 012 module basic telephone module provides 21 VDC to single-line telephones and equipment.

When single-line telephones are connected to a 012, 800 DID, or 008 OPT module, a 129B Frequency Generator (ring generator) must be installed in the power supply module of each carrier that houses one or more of these modules.

A green LED on the power supply module remains on as long as the module is receiving power. The power supply module also has an on/off switch and a modular telephone jack for connecting an auxiliary power unit as needed (see Figure 5-3).
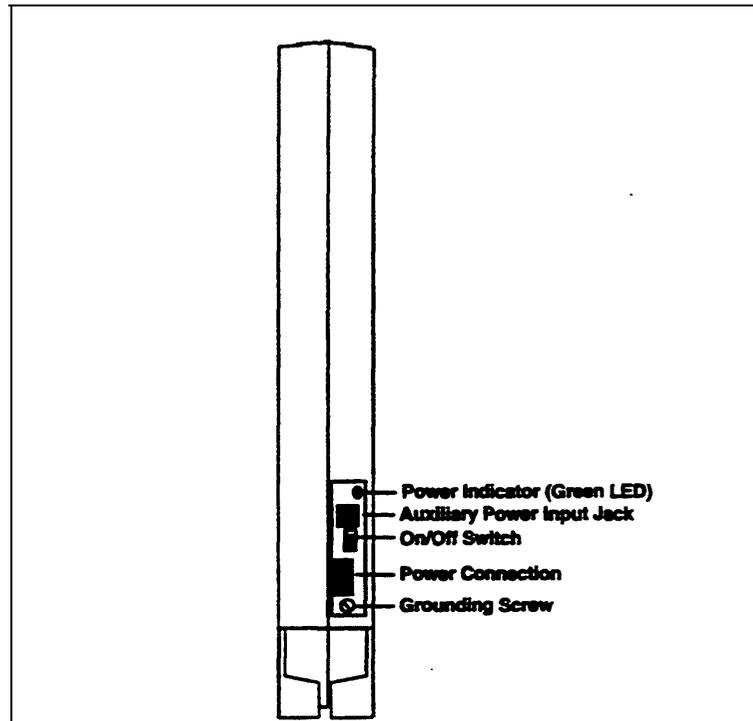
Figure 5-3   Power Supply Module

Processor Module

Placed in slot 00 of the basic carrier, the processor module controls system features and programming via the processor and memory boards and the feature module. The processor module comes in small and large versions. The small system supports up to 24 outside lines/trunks and 56 stations/station endpoints; the large system supports up to 80 outside lines/trunks and 144 stations or 255 station endpoints.

The main board contains the 68000 microprocessor, a built-in 1200 bits-per-second (bps) data modem, built-in diagnostics, RAM, a real-time clock, and interrupt circuitry, and interfaces to the other modules through the I/O bus on the carrier backplane.

The processor module has two modular RS-232 jacks: one for Station Message Detail Recording (SMDR) and the other for system programming and maintenance via a PC (see Figure 5-4).
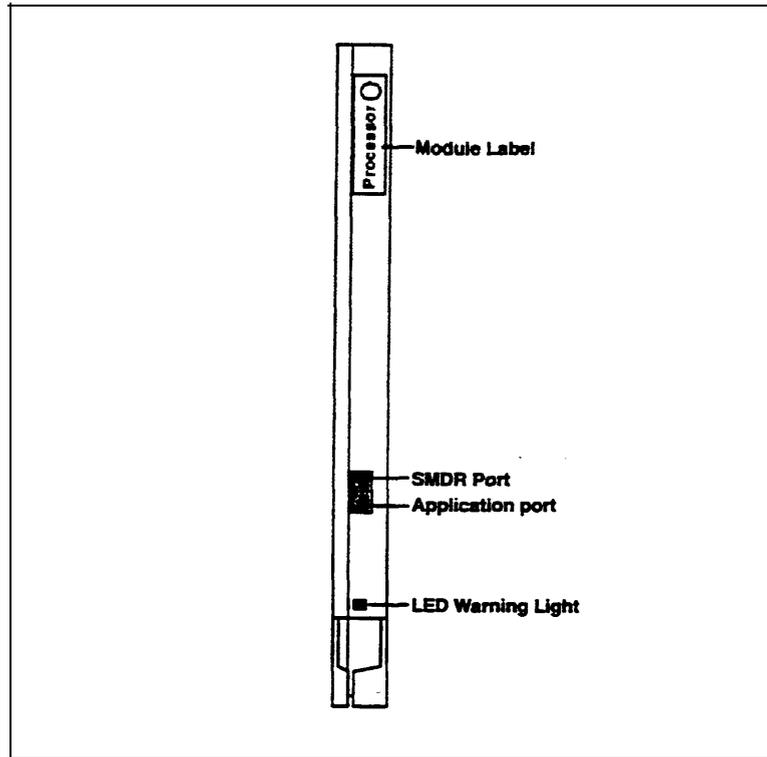
Figure 5-4   Processor Module

A NiCad battery in the processor module provides backup power for the real-
time clock and nonvolatile RAM in case of power failure or system shutdown.
The battery provides RAM data retention for 12 to 30 days. The trickle-charge
circuit can recharge the battery to 50 percent of capacity from a discharged
state in 48 hours. The minimum battery life is five years.

Line/Trunk and Station Modules

The line/trunk and station modules have jacks for connecting the telephone
company lines/trunks and the station lines to the control unit. The station lines
connect to telephones and adjuncts such as answering machines and fax
machines.

Depending on the mode of operation chosen, the outside lines that extend from
the telephone company's central office are called trunks or lines. "Trunks" is
used for Hybrid/PBX mode and in the phrase "tie trunks." "Lines" is used for Key
or Behind Switch modes.

There are different types of lines/trunks for the different functions of each mode. A Key or Behind Switch system can use the following:

■ loop-start lines

■ tie trunks

■ a DS1 facility programmed for either T1 or ISDN-PRI operation

■ a ground-start (GS) line only when registered under the MF FCC classification

A Hybrid/PBX system can use the following:

■ loop-start trunks

■ ground-start trunks

■ tie trunks

■ direct inward dialing (DID) trunks

■ a DS1 facility programmed for either T1 or ISDN-PRI operation

A system with a basic carrier has five slots for these modules. Up to two expansion carriers can be added, each one adding six slots.

The names of modules consist of a number that identifies the number of line/trunks and/or stations that can be connected to the module, followed by the types of lines and/or telephones it supports. For example, the 408 GS/LS module provides four line jacks and eight station jacks and supports ground-start or loop-start lines.

The system supports 13 types of line/trunk and station modules (see Figure 5-5). Table 5-1 lists the specifications for each type of module.

Merlin II Release 3 Reusable Modules

The following modules used in a Merlin II Release 3 system can be used in this system:

■ 391A power supply module*

■ 800 line/trunk module

■ 400 line/trunk module

■ 400 E&M line/trunk module

■ 012 basic telephone module

■ 008 analog station module

■ 408 analog line/trunk and station module

---

* While the 391A power supply module can be reused in the system, it does not supply as much power as the 391A1 power supply module and should be replaced if anything is added to the station side of the system. The 391A also has less protection against power surges than the 391A1.
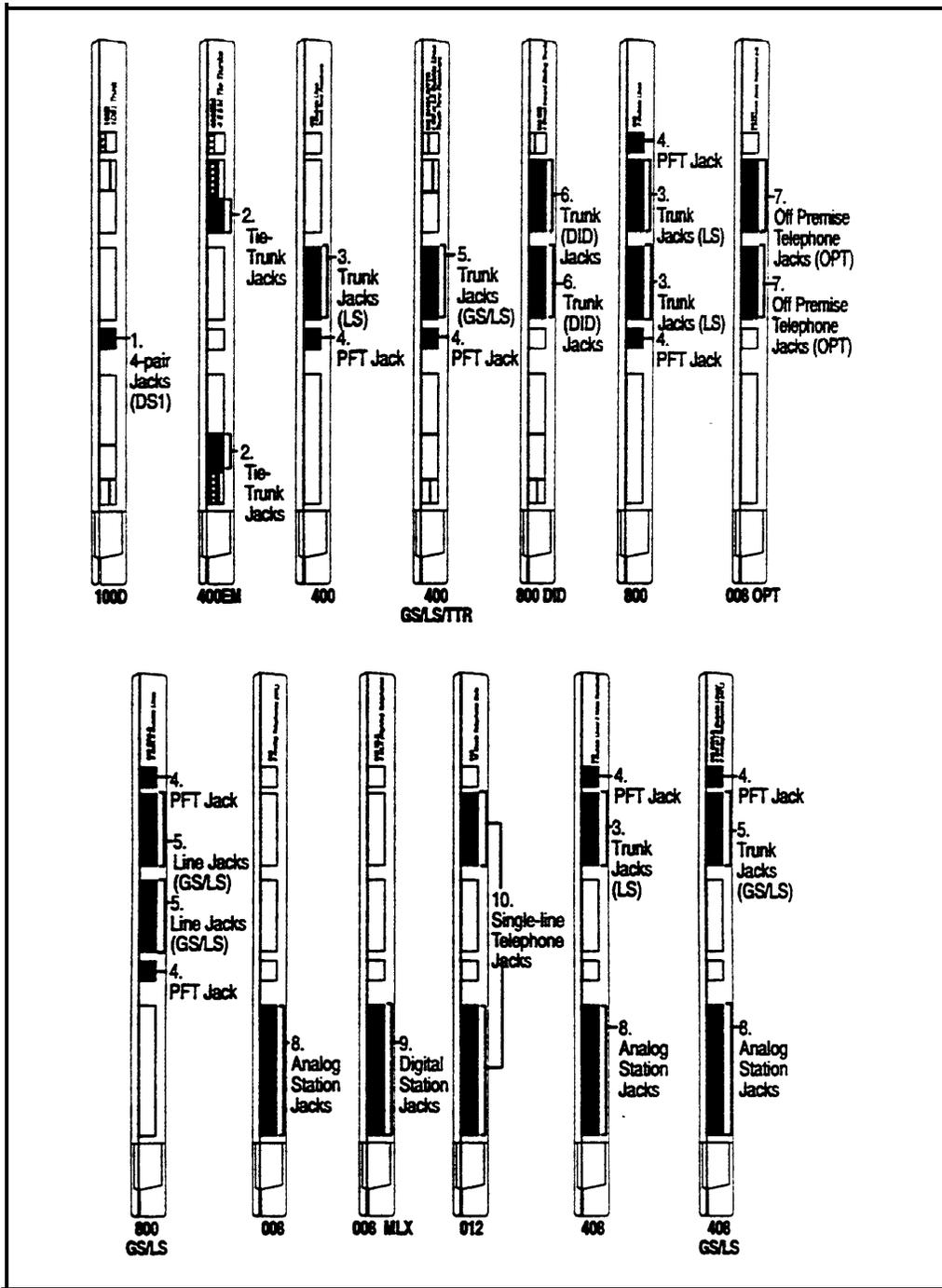
Figure 5-5   Line/Trunk and Station Modules

Table 5-1   Line/Trunk and Station Modules

Module	Line/Trunk Type	Station Type	Specifications
008	N/A	Analog multiline telephone CMS	**Capacity:** 8 analog stations **Signaling:** analog multiling telephone protocol (40 kbps) **Loop range:** 1000 feet in-building or in-range out-of-building (with analog IROB protectors) service only
008 MLX	N/A	MLX telephone digital data device (such as ISDN 7500B Data Module)	**Capacity:** 8 digital stations, each with 1 or 2 endpoints (each endoint is assigned an individual extension number), including the following station types: ■ digital voice only ■ digital voice with Voice Announce to Busy feature ■ digital voice and digital data (via the ISDN 7500B Data Module) ■ digital voice and MFM ■ digital data only (ISDN 7500B Data Module) **Signaling:** ISDN-BRI S/T protocol (two 64-kbps B channels, one 16-kbps D channel) on a passive bus **Power:** 48-VDC phantom power to telephone; 48 VDC over a separate pair (7-8) to a system operator DSS console **Loop range:** 1000 feet, in-building and in-range out-of-building (with MLX IROB protectors) only service
008 OPT	N/A	On-premises or off-premises single-line telephone	**Capacity:** 8 T/R stations* on two-way voice transmission path with support for telephones with message-waiting LEDs, 2 TTRs **Notice to telephone company:** meets FCC Class C **Ringing Current:** 105-Vrms, 30-Hz sinusoidal ringing superimposed on -48 VDC; a ring generator must be installed in the power supply module of each carrier that has a 008 OPT module. **REN:** ≤ 1.0 per port **Disconnect signal:** 900 ms (T/R short for answering machines, G3 fax, etc.) **Switchhook flash detection:** 300 - 1200 ms **Loop resistance:** serves 2-wire loops to 1300 ohms, including stations
012	N/A	Single-line telephone MERLIN Attendant MERLIN MAIL Voice Messaging System T/R adjunct (such as an answering or fax machine) Analog data device (such as a modem)	**Capacity:** 12 T/R stations on 2-way voice transmission path with support for telephones wioth message-waiting LEDs, 2 TTRs **Power:** 21-VDC, 600-ohm battery source **Ringing current:** 105-Vrms, 30-Hz sinusoidal ringing superimposed on -48 VDC; a ring generator must be installed in the power supply module of each carrier that has a 012 module. **REN:** ≤ 1.0 per port **Disconnect signal:** 900 ms (T/R short for answering machines, G3 fax, etc.) **Switchhook flash detection:** 300 - 1200 ms **Loop range:** 1000 feet, in-building and in-range out-of-building service only
100D	T1 or PRI		**Capacity:** 24 lines/trunks for voice and analog data or 23 lines/trunks for voice and data with 1 channel used for signaling **Mode:** multiplexes 24 or 23 lines/trunks into 1 facility and demultiplexes 1 facility into 23 or 24 lines/trunks **Speed:** up to 64 kbps **Signaling:** DS1 or 4-wire; T1 uses RBS or CCS; PRI has ISDN-PRI (23 B + D)

* The system software recognizes the OPT module as a 012 module. Even though the OPT module only has 8 jacks, it uses 12 ports of capacity, thereby decreasing overall station capacity by four stations for every OPT module.

Table 5-1 Continued

Module	Line/Trunk Type	Station Type	Specifications
400†	LS and TTR	PFT telephone	**Capacity:** 4 lines/trunks, 4 TTRs, 1 PFT telephone **Signaling:** loop-start
400EM	Tie trunk		**Capacity:** 4 tie trunks **Method of Completion:** automatic or dial-repeating start, immediate-start, wink-start, or delay-dial-start **Signaling:** E&M type 1S, type 1C, type 5
400 GS/ LS/TTR	LS or GS and TTR	PFT telephone; button needed for GS PFT telephone	**Capacity:** 4 lines/Ttrunks, 4 TTRs, 1 PFT telephone **Signaling:** loop-start or GS, optioned per port
408†	LS	Analog multiline telephone CMS PFT telephone	**Capacity:** 4 lines/trunks, 8 stations, 1 PFT telephone **Station signaling:** analog multiline telephone (40 kbps) **Line/trunk signaling:** loop-start line/trunk; analog voice **Loop range** 1000 feet, in-building and in-range out-of-building (with analog IROB protectors) service only
408 GS/LS	LS or GS	Analog multiline telephone CMS PFT telephone button needed for GS PFT telephone	**Capacity:** 4 lines/trunks, 8 stations, 1 PFT telephone **Station signaling:** analog multiline telephone (40 kbps) **Line/trunk signaling:** loop-start or ground-start line/trunk (optional per port); voice **Loop range:** 1000 feet. in-building and in-range out-of-building (with analog IR0B protectors) service only
800†	Ls	PFT telephone	**Capacity:** 8 lines/trunks, 2 PFT telephones **Signaling:** loop-start
800 DID	DID		**Capacity:** 8 lines/trunks, 2 TTRs **Protocol:** incoming calls only; 2-way (one-pair) fixed impedance to DID trunks; no outgoing calls **Signaling:** loop-reverse battery wink-start or immediate-start; accepts touch-tone dialing
800 GS/LS	LS or GS	PFT telephone: button needed for GS PFT telephone	**Capacity:** 8 lines/trunks, 2 PFT telephones **Signaling:** loop-start or ground-start

† Although these MERLIN II modules are supported in MERLIN LEGEND, the following are the recommended modules for the MERLIN LEGEND system: 400 GS/LS, 408 GS/LS, 800 GS/LS

Telephones and Consoles

Several different analog and single-line telephones can be used with the system; the only digital telephones that can be used with the system are the digital/ISDN (MLX) telephones.

⚠ WARNING:

An analog or digital multiline telephone located in a different building but within 1000 feet of the control unit requires an IROB (in-range out-of-building) protector at each building entrance.

MLX Telephones

There are four telephones in the MLX telephone line, all of which support the Integrated Services Digital Network (ISDN) services that can be used with the system.

■ MLX-20L™

■ MLX-28D™

■ MLX-10D™

■ MLX-10™

Some features are common to all MLX telephones:

■ programmable line and feature buttons with two associated lights (red and green)

   Note: An MLX-20L telephone used as a QCC has no programmable buttons.

■ fixed-feature buttons (four have a red or green LED)

■ red message-waiting LED

■ built-in speakerphone

■ volume control for speakerphone, handset, and ringer

■ user reference card tray with feature and programming codes and directory lists

■ optional internal MFM to connect to tip/ring (T/R) equipment and alerting devices

   Note: An MLX-20L telephone used *as* a QCC cannot have an MFM.

   two-position adjustable desk stand

   four-pair modular line cord

MLX telephones with display have two additional features:

■ LCD display

■ display-associated buttons

A list of features specific to each telephone model in the MLX family follows.

Model MLX-28D

■ can be used as a DLC system operator console

■ 28 line and feature buttons

■ display (2 lines x 24 characters)

■ 8 display-associated buttons

■ accommodates one or two Direct Station Selectors (DSSs)
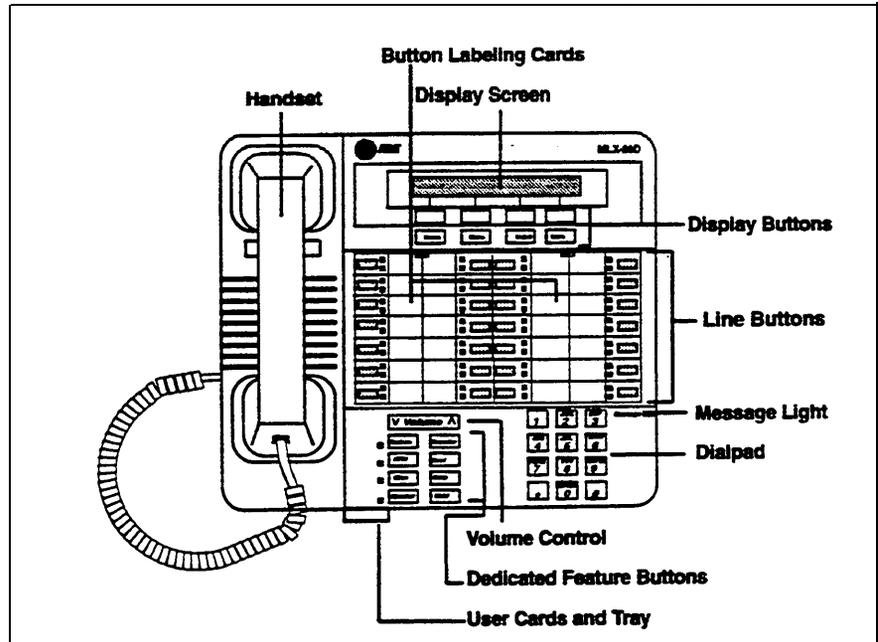
Figure 5-6   MLX-28D Telephone

Model MLX-20L

■ can be used for system programming and as a DLC or a QCC system operator console

■ 20 line and feature buttons

■ display (7 lines x 24 characters)

■ 14 display-associated buttons

■ accommodates one or two Direct Station Selectors (DSSs)
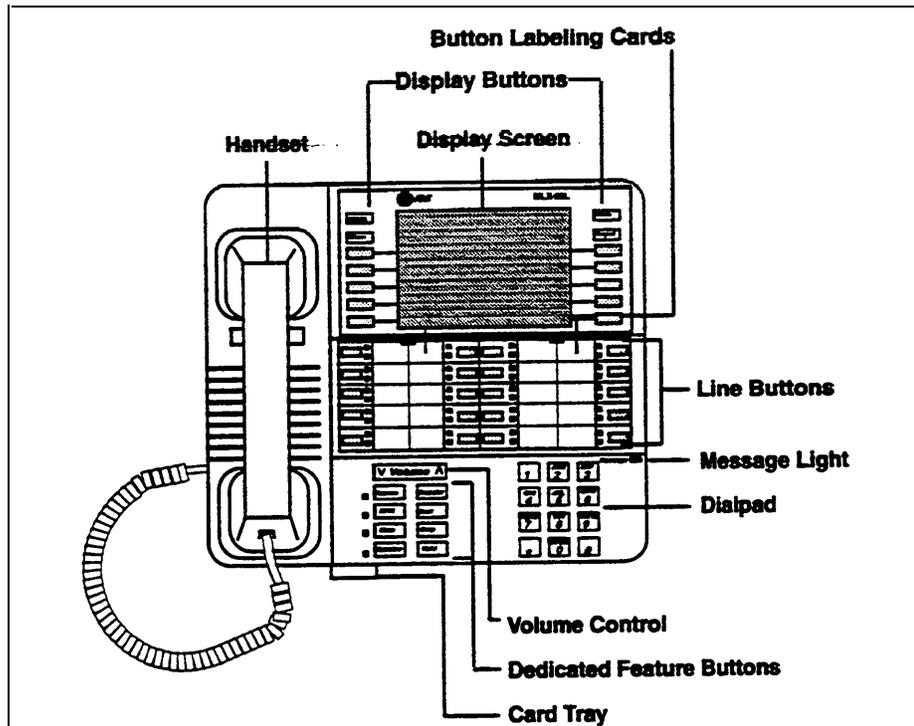
Figure 5-7   MLX-20L Telephone

Model MLX-10D

■ 10 line and feature buttons

■ desktop or wall-mount

■ display (2 lines x 24 characters)

■ 8 display-associated buttons
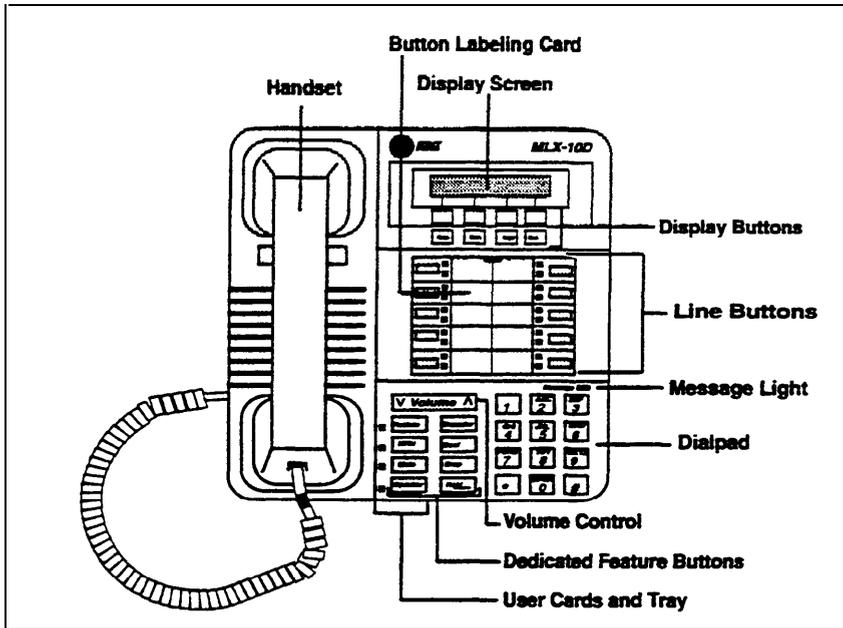
Figure 5-8   MLX-10D Telephone

Model MLX-10

■ 10 line and feature buttons

■ desktop or wall-mount
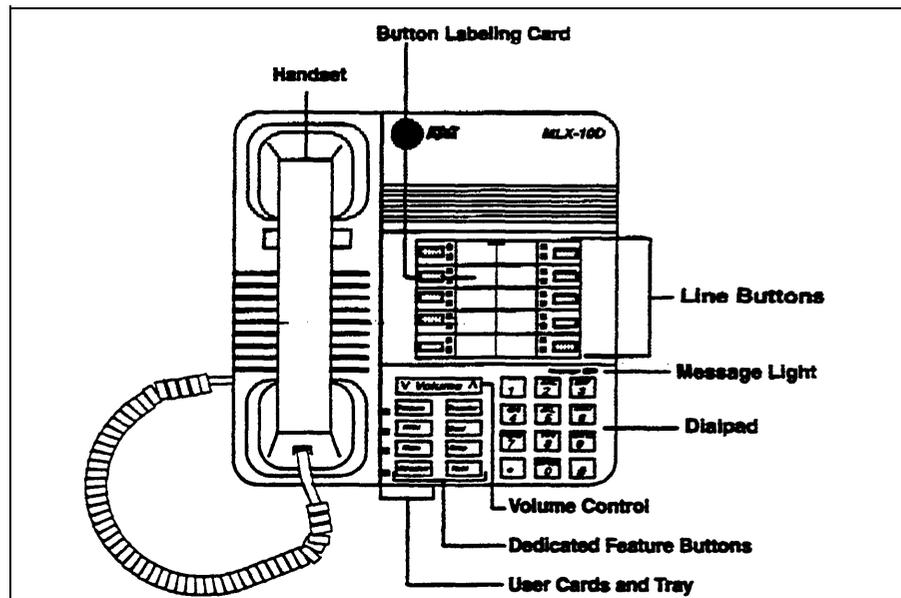
Figure 5-9   MLX-10 Telephone

Analog Multiline Telephones

In addition to the MLX telephones, the analog multiline telephones in Table 5-2 can be connected to the system.

Table 5-2   Analog Multiline Telephone

Model	Description
5-button•	5-button telephone with membrane. No adjuncts are supported.
10-buttonŽ	10-button telephone with membrane
34-buttonŽ	34-button basic telephone with membrane
34-button DeluxeŽ	Deluxe 34-button telephone with membrane
10-button HFAIŽ	10-button hands-free-answer telephone. No adjuncts are supported.
34-button BISŽ	34-button telephone with built-in speakerphone
34-button BIS/DISŽ	34-button telephone with 16-Character display and built-in speakerphone
BIS-10	10-button telephone with built-in speakerphone
BIS-22	22-button telephone with built-in speakerphone
BIS-22D	22-button telephone with 16-character display and built-in speakerphone
BIS-34	34-button telephone with built-in speakerphone
BIS-34D	34-button telephone with 16-character display and built-in speakerphone
MLC-5 Cordless	Cordless 5-button telephone

Ž Vintage telephone; no longer available for sale or lease

Single-Line Telephones

The system supports the single-line analog telephones listed in Table 5-3.

Note: 2500MM or 500MM telephones should be used for PFT telephones. If telephones are to be connected to ground-start lines/trunks, a ground-start button (KS 23566L1, PEC31021) must be added to each PFT station. If rotary lines/trunks are used, PFT telephones must be rotary telephones.

Table 5-3   Single-Line Telephones

Model	Description
2500MMGB	Basic desk telephone
2554MMGJ	Basic wall telephone
2500YMGK•	Basic desk telephone with Message light and Recall button; Recall button is used instead of the switchhook for features that require a switchhook flash, such as Transfer and Hold.
2500SM	Basic desk telephone used with 4A speakerphone
2514BMW	Basic desk telephone with built-in headset jack
2526BMG	Outdoor telephone used with weatherproof enclosure
7101A•	Basic desk telephone with Message light and Recall and Disconnect buttons. No adjuncts supported.
7102A	Basic desk telephone with Message light lamp and Recall button. The 101 and 201 speakerphones and the 500 headsets are supported. Can be used for power-failure transfer (PFT) stations.
CS6402U01A•	Basic desk telephone, Feature Phone Model 420. Has built-in speakerphone, memory, and redial.
2500MMGJ	Basic desk telephone
2500MMGK	Basic desk telephone with the following limitation: timed Recall button action (similar to a switchhook flash) activates the Hold and Transfer features.
500MM 554BMPA 500SM	Basic telephone with the following limitation: equipped with rotary dials so no system features requiring * and # can be used. Telephones with neon Message lights are not supported.

•Vintage telephone; no longer available for sale or lease.

Telephones and Adjuncts Not Supported

> ⚠️ **CAUTION:**
>
> *The following telephones and adjuncts cannot be used with the system. Connecting them can damage the telephones, adjuncts, and system.*

Table 5-4 Telephones and Adjuncts Not Supported

Model	Notes
510D Personal Terminal	Uses Digital Communications Protocol (DCP)
DCP telephones	7400 telephones and adjuncts (asynchronous data units and multiple asynchronous data units) that use DCP and that are supported on MERLIN II
MET telephones	Multibutton electronic telephones (MET) and adjuncts that are used with the Dimension™ PBX and Horizon™ communications systems
Single-line telephone	With neon Message light
Analog telephone adjuncts	Basic telephone modem interface (BTMI and BTMI-2) Off-premises extension (OPX) unit System 25 direct extension selector (DXS) DSS attached to a 34-button deluxe membrane

System Operator Consoles

System operator consoles are telephones that are programmed for call handling and other system operator duties. They can be used in two configurations—direct-line console (DLC) and queued call console (QCC). QCCs are available only in Hybrid/PBX mode. In a DLC configuration, lines/trunks are assigned to individual buttons and the console can have several calls ringing at the same time. In a QCC configuration, incoming calls are held in a queue and calls are directed to a QCC as a position becomes available. Only one call rings at a time.

System operator functions are provided via DLCs using the following telephones:

■ MLX-20L*

■ MLX-28D*

■ MERLIN II System Display Console with built-in DSS

■ BIS-34D

■ BIS-34

■ BIS-22D

Note: In a Hybrid/PBX system, the MLX20L telephone can function as a QCC; it is the only telephone that can do this.

DLCs are connected either to an analog station jack on a 008 or 408 analog multiline telephone module, or to a digital station jack on a 008 MLX module. QCCs must be connected to a digital station jack on a 008 MLX module. The first QCC must be connected to the first station jack in the system.

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* One or two DSS adjuncts can be added to provide 50 or 100 additional extension buttons.

Adapters

Adapters connect adjuncts to the system and stations. They provide access for both voice and data signals.

System Adapters

Two adapters connect directly to the control unit: the channel service unit (CSU) and the Universal Paging Access Module (UPAM).

Channel Service Unit

The CSU is the interface between the 100D module and the DS1 facility provided by the telephone company. This facility contains 24 channels on one 4-pair wire that connects to the back of the CSU. The CSU then connects to the modular jack on the 100D module.

For more on B8ZS line coding, see Chapter 4 "Functional Description."

There are an ESF T1 CSU and a 551 T1 L1 CSU. The ESF T1 CSU (extended superframe) is recommended for this system because it allows the unit to be maintained without interrupting service and provides diagnostic and testing capabilities, and it is the only CSU that provides bipolar 8 zero code substitution (B8ZS) line coding. The lower-cost 551 T1 L1 CSU performs most of the functions of the ESF T1 CSU but does not provide the B8ZS line coding required for 64-kbps data and for maintenance features. The 551 T1 L1 CSU also does not provide diagnostic and testing capabilities.

Figures 5-10 and 5-11 detail the CSU connections.
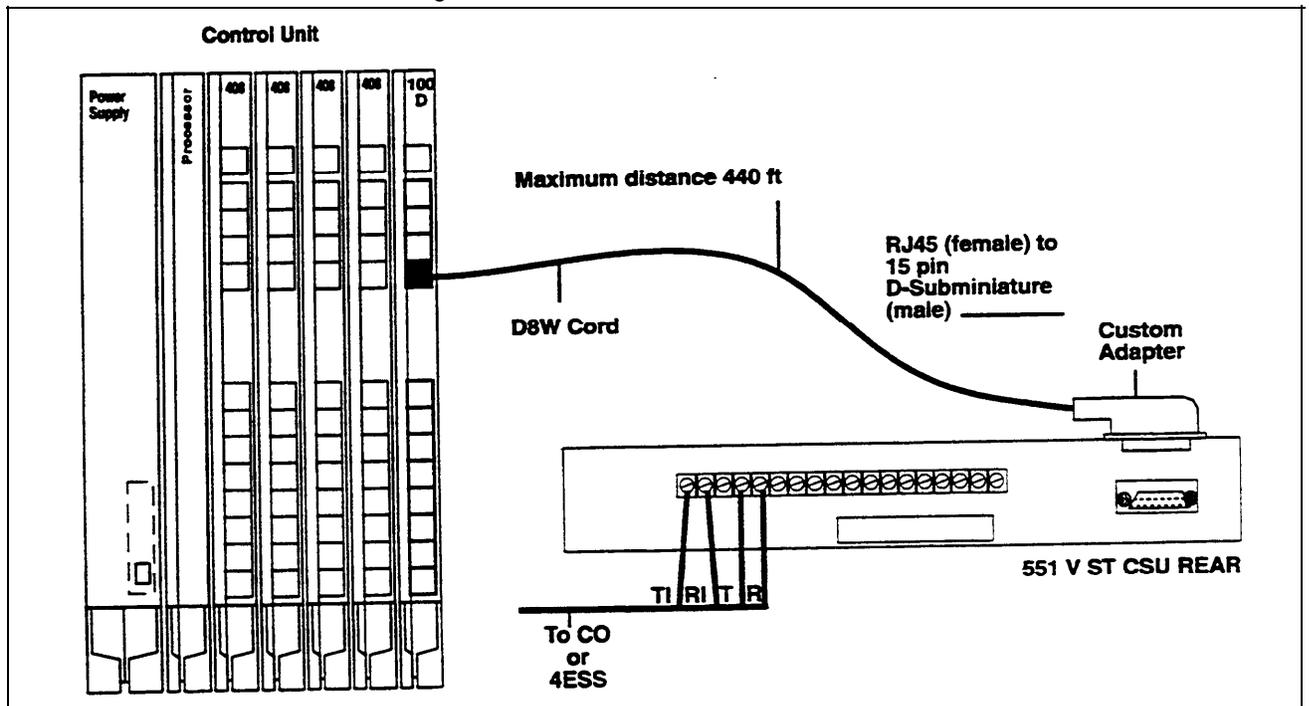
Figure 5-10   551 T1 L1 Channel Service Unit Connections
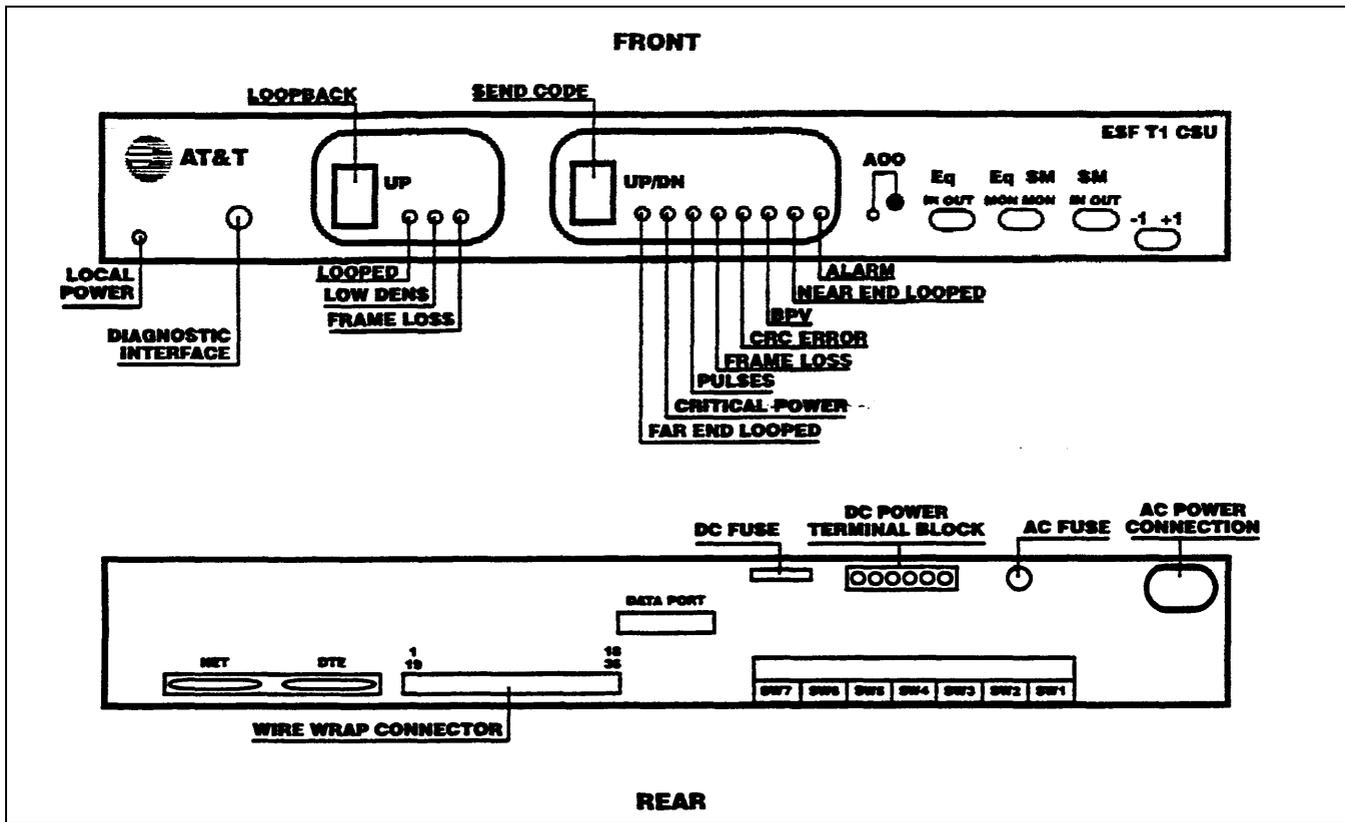
Figure 5-11   ESF T1 Channel Service Unit Connections

Universal Paging Access Module

The UPAM connects customer-provided paging equipment to a loop-start jack on the control unit. This module should be used with a PagePac paging system when the accompanying Zonemate equipment is not used. An acknowledgement tone is not provided when a UPAM is used.

The UPAM is ordered as a D-kit. The kit contains a power source, a microphone matching transformer, and an access module.

Telephone Adapters

The adapters described below are used to connect various adjuncts to the telephones.

Multi-Function Module

The Multi-Function Module (MFM) is an optional digital adapter for connecting tip/ring (T/R) or supplemental alert adjuncts to any MLX telephone The MFM is a circuit board that mounts inside the telephone. Adjuncts plug into a modular jack on the MFM. The MFM is the only T/R adapter used with MLX telephones.

Note: An MFM cannot be used in an MLX-20L telephone serving as a QCC.
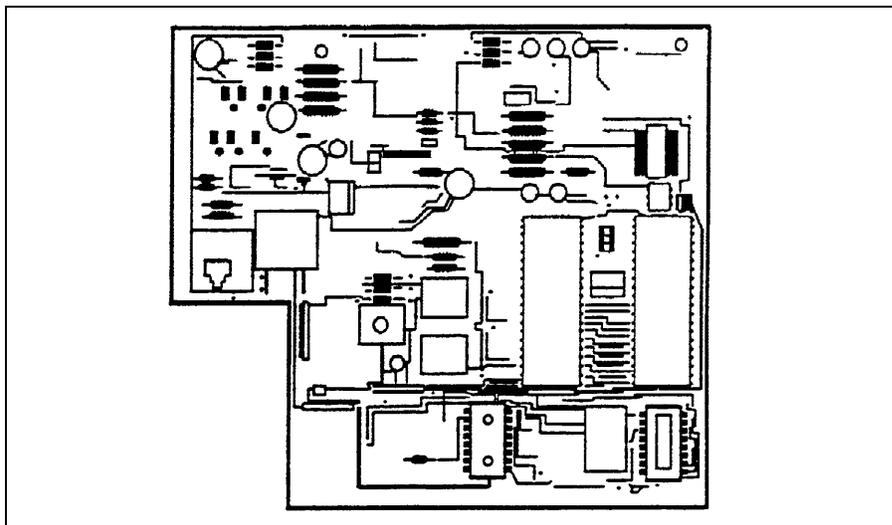
Figure 5-12   Multi-Function Module

⚠️ **WARNING:**

> The *MFM can be installed or repaired only by an AT&T technician or an authorized dealer representative. To eliminate the risk of electrical shock, the MLX telephone should not be disassembled.*

T/R adjuncts operate independently of the telephone. If the telephone is in use, voice or data calls can still be sent and received by the adjunct. The MFM allows the use of the following T/R adjuncts:

■ answering machines

■ fax machines

■ modems

■ credit card verification terminals

■ cordless telephones

■ 2500-type telephones

Supplemental alerts such as bells, chimes, horns, and strobes notify people in noisy areas of incoming calls.

The MFM is shipped with a KS22911L1 or L2 power unit that supports one MFM and one DSS. When two DSSs are connected to a telephone, a 329A wall power unit is used instead of the KS22911. With either type of power unit, the total cord length can be no more than 50 feet from the telephone.

The MFM supports only touch-tone dialing and does not detect pulse-dialing. Also, the MFM does not supply a switchhook flash, so no transfer calls can be made from a station attached to an MFM.

Note: The MFM uses one of the two B-channels when it is active. This means that when an accessory, such as a fax machine, and the MLX telephone are in use at the same time, Voice Announce to Busy and speakerphone paging cannot be used. (When Voice Announce to Busy is being used, a person calling an MFM extension gets a busy signal; a person attempting to call out from a station attached to an MFM will not get a dial tone.)

Two jumper blocks on the MFM configure it for either tip/ring (T/R) or supplemental alert operation. These are preset at the factory for T/R operation.

Note: Only AT&T or an authorized dealer representative should change the jumper settings.

In the T/R mode, the MFM can connect to 20-Hz AC external alerting devices such as a loud external ringer and E1CM-type ringer. If several devices are connected to the MFM, only one device can be off-hook at a time and the total ringer equivalent number (REN) ≤ 2.0.

General Purpose Adapter

A General Purpose Adapter (GPA) permits the attachment of a T/R device such as a single-line telephone, modem, or answering machine to an analog multiline telephone. The device must be touch-tone, not rotary and calls must be originated on the analog multiline telephone since the GPA has no pulse or touch-tone detectors.

One end of a 4-pair cord plugs into the V.T. jack on the back of the GPA, and the other end plugs into the OTHER jack on the underside of the telephone. The 1- or 2-pair cord from the T/R device plugs into the TEL. EQUIP. jack on the GPA (see Figure 5-13).
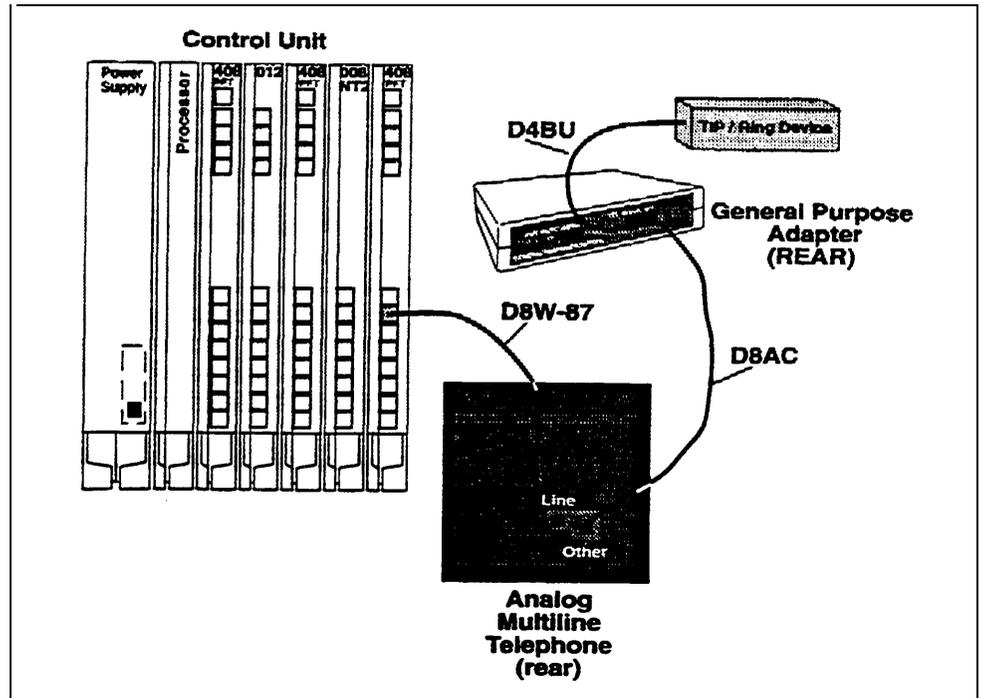
Figure 5-13   GPA Connections

Sliding the switch on the back of the GPA to the proper setting provides the GPA service required.

■ **Basic.** This setting is used to dial and answer calls on an analog multiline telephone or to attach a T/R device such as a single-line telephone, answering machine, or fax machine. Incoming calls ring only on the analog multiline telephone.

■ **Join.** This setting is used to add a recording device or a single-line telephone to a call that is in progress on the analog multiline telephone. You cannot originate or answer calls on this setting.

■ **Automatic.** This setting is used in two ways:

　■ with a device, such as an answering machine or a modem, to answer calls. An Auto Answer-All button is needed so that calls can be answered automatically.

　■ to make and receive calls on the telephone while a computer or modem attached to the GPA is being used. This is called simultaneous voice and data.

ISDN 7500B Data Module
For more information on 7500B Data
Module, see the Data Guide:

The ISDN 7500B Data Module connects a data terminal to the system on a 008 MLX module so that a user can make and receive calls at a digital data station. Instead of converting digital data signals to analog signals as a modem does, the data module maintains a digital data format that allows transmission to another digital station or over the ISDN-PRI telephone network. On a data terminal, the keyboard is used to dial the number.

Note: A data module cannot be used with a QCC.

The ISDN 7500B Date Module provides an RS-232 interface for asynchronous data terminal equipment operating at speeds of up to 19.2 kbps. The data module also provides a CCITT V.35 interface for synchronous data terminal . equipment operating at speeds of up to 64 kbps. (Optional enhancement boards must be ordered separately)

The data module can be setup to handle a variety of data communications equipment (DCE) and is the only digital adapter that can be used with the system.

The data module's front panel has the following features (see Figure 5-14):

■ **Power/Test LED.** Lights when power is supplied; flashes when tests are performed.

■ **Data LED.** Flashes to indicate an incoming data call and lights when a call is in progress; flashes when tests are performed.

■ **Displays.** Displays status information and option settings.

■ **Next, Back, and Enter buttons.** Used to operate the data module and to adjust the screen's contrast.
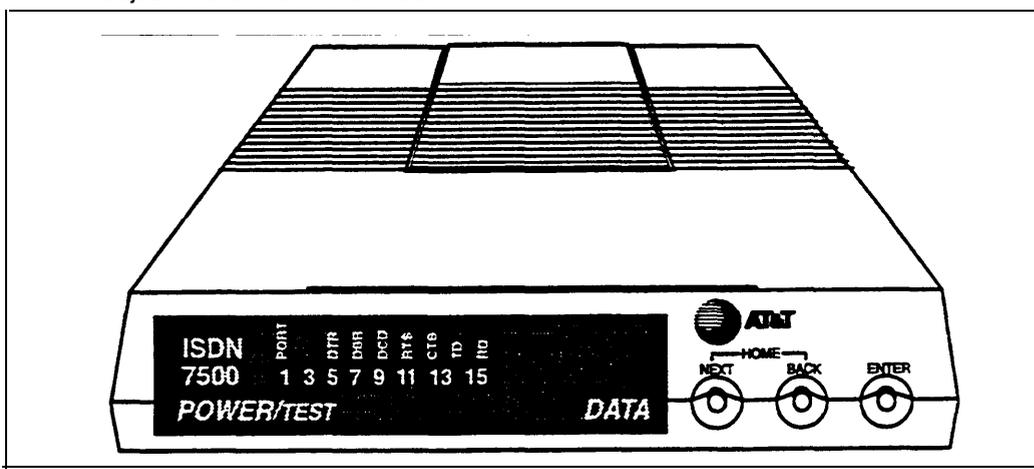
Figure 5-14   ISDN 7500B Data Module Front Panel

The data module's back panel has the following features (see Figure 5-15):

■ **Phone jack.** Connects an MLX telephone to the data module.

■ **Line jack.** Connects the data module to an MLX system module.

■ **Power connector.** Connects the data module to the DC power supply, which connects to an AC outlet.

■ **Port 1.** Connects the 7500B to a data terminal, computer, or modem.

■ **Port 2.** When an enhancement board is installed for synchronous operation, Port 2 connects a second data terminal, an automatic calling device (with an RS-366 interface), or a data terminal with a V.35 interface.

Note: A modem can provide an analog data interface from an MLX telephone that has an MFM installed. When an MLX telephone has an MFM, the data module cannot be installed on the same line.
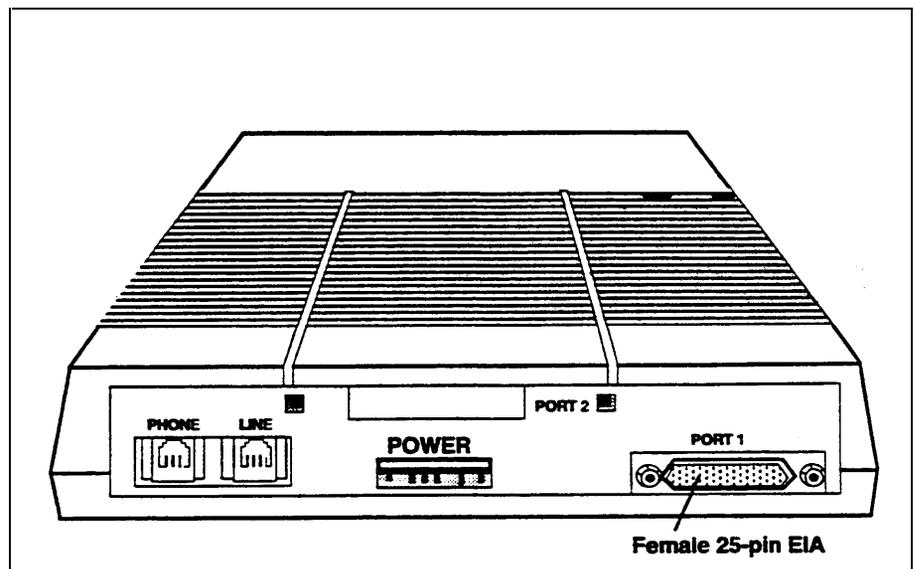
Figure 5-15   ISDN 7500B Data Module Back Panel

When the ISDN 7500B Data Module is used with an MLX telephone, one end of the D8W cord is plugged into the PHONE jack on the data module and the other end of the cord is plugged into the LINE jack on the MLX telephone. The maximum cord length from the data module to the telephone cannot exceed 80 feet. The MLX telephone cannot be used to dial data calls, and the data terminal equipment connected to the data module cannot be used to dial voice calls. Each device operates independently, and features are assigned to each device independently.

Note: Do not connect two ISDN 7500B Data Modules on one line.

The data module can be configured as a stand-alone by ordering a WP90110,L1 power unit (PEC21625). The data module can also be configured in a multiple-mount arrangement by ordering a Z77A data mounting (PEC 21626), which provides a common power supply for up to eight data modules. Both the power unit and the data mounting require a 115-VAC power outlet. Neither the power unit nor the data mounting is provided with the data module; both must be ordered separately.

The ISDN 7500B Data Module does not have the internal 100-ohm line termination that is provided with MLX telephones. Therefore, when it is used without an MLX telephone, a 100-ohm 440A4 terminating resistor adapter (PEC 2709-A59) must be installed on the line near the data module.

To provide synchronous operation at speeds up to 64 kbps, the following optional circuit boards must be ordered:

■ **Multipurpose Enhancement Board.** Provides an RS-366 Automatic Calling Unit (ACU) interface and converts the RS-232 interface on the main circuit board from asynchronous to synchronous. A V.35 adapter cable must be ordered separately to operate at the lower data rates and also at data rates of up to 56 and 64 kbps. Without the adapter cable, data rates are limited to 1200, 2400, 4800, 9600, and 19,200 bps.

■ **High-Speed Synchronous Interface Enhancement Board.** Provides a V.35 interface at synchronous data rates of 48, 56, or 64 kbps. A V.35 adapter cable that converts the 25-pin male connector on the board to the industry-standard 34-pin V.35 interface is included.

Data Module Features

The ISDN 7500B Data Module offers the following features:

Asynchronous Features

■ RS-232 interface

■ asynchronous full-duplex operation

■ selected data rates of 300, 1200; 2400, 4800, 9600, and 19,200 bps

■ data options set via the data terminal attached to the RS-232 interface

■ ability to change options without dropping a data call

■ autobaud (also called data metering or speed matching) — the ability to adjust the speed of transmission to match the speed of the data terminal being called

■ auto-adjust — the ability to adjust to the speed and parity of the data terminal being used

■ call setup (dialing) from the keyboard of an ASCII data terminal by using the local command (CMD) mode or AT mode

■ automatic or manual answering of incoming data calls

Synchronous Features with Multipurpose Enhancement Board

■ RS-232 interface

■ half- or full-duplex operation using the RS-232 interface at data rates of 1200, 2400, 4800, 9600, and 19,200 using data transport Mode 2

■ half- or full-duplex operation at 56 kbps via the V-35 interface adapter cable

■ full-duplex operation at 64 kbps via the V.35 interface adapter cable

■ automatic answering of incoming data calls

■ ability to make outgoing data calls manually and select user-programmable telephone numbers from the data module display on the front panel

■ RS-366 interface to an Automatic Calling Unit (ACU)

Synchronous Features with High-Speed Synchronous Enhancement Board

■ V.35 interface (the adapter cable is provided when the board is ordered by using PEC 21624)

■ full-duplex operation at 48, 56, and 64 kbps

■ half-duplex operation at 56 kbps only

■ automatic answering of incoming data calls

■ ability to make data calls manually and select user-programmable telephone numbers from the data module display on the front panel

Modems

For more information on modems and modem pools, see the Data Guide.

A modem is used at an analog data station to make and answer data calls. It converts the digital signals of the data terminal into analog signals for transmission over standard telephone lines. It also converts incoming analog signals to digital signals for acceptance by the data terminal.

Most types of modems can be connected to the system unless the modem is being used in a modem pool. Hardware requirements for modem pools are discussed later in this chapter.

If a modem is used with an MLX telephone, a Multi-Function Module (MFM) must be installed in the telephone to provide a tip/ring interface for the modem. The modem is connected directly to the MFM. If the modem is used with an analog multiline telephone, a GPA is required to provide a tip/ring interface for the modem.

When a modem is connected to an MLX telephone using an MFM, data calls are dialed using the data terminal keyboard and voice calls are dialed using the telephone dialpad. The MLX telephone cannot be used to dial data calls, and the data terminal keyboard cannot be used to dial voice calls. Each device operates independently, and features are assigned to each device independently.

When a modem is connected to an analog multiline telephone using a GPA, data calls and voice calls are dialed by using the telephone dialpad. The modem and telephone do not operate independently features assigned to the telephone also apply to the analog data station (modem and associated data terminal).

Modem Features

The modem used in an analog data station (and not in a modem pool) provides the following features:

■ dialing or ending asynchronous data calls from the keyboard when connected using a basic telephone station jack on a 012 module or when connected to an MLX telephone using an MFM

■ autobaud (also called data metering or speed matching) - the ability to adjust the speed of transmission to match the speed of the data terminal being called

■ automatic or manual answering of incoming data calls

■ self-test and maintenance procedures

■ ability to set data options for the call on the keyboard and, if necessary, change the options without dropping the call

**Supplemental Alert
Adapter**

A supplemental alert adapter (SAA) allows the connection of an alerting device
such as a bell or chime to an analog multiline telephone (see Figure 5-16).
These alerts notify people working in noisy areas of incoming calls.
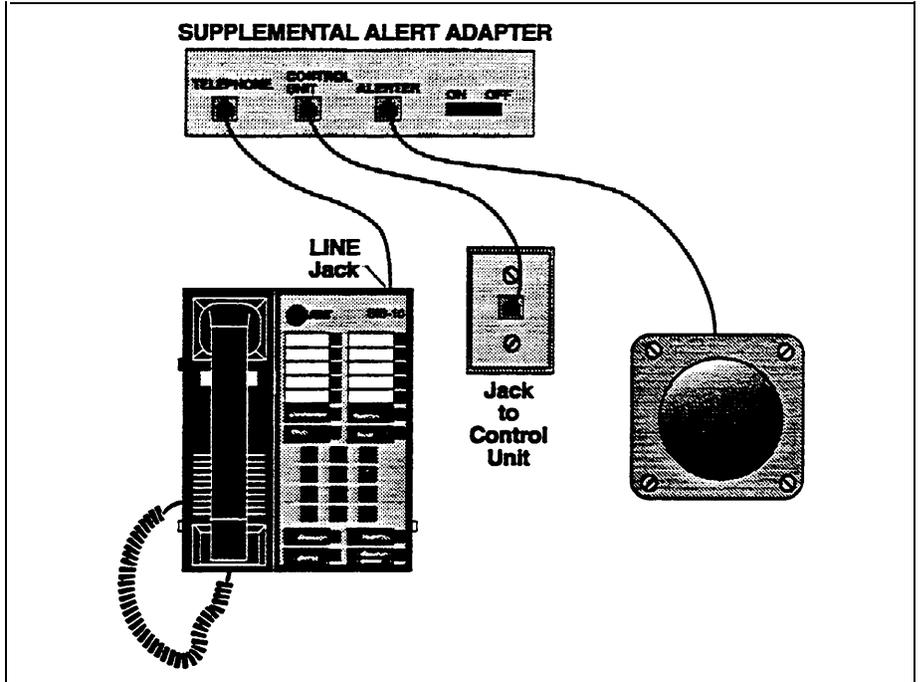
Figure 5-16   SAA Connections

The telephone cord plugs into the jack labeled TELEPHONE; the cord from the
external alert device plugs into the jack labeled ALERTER; and the cord from the
station jack plugs into the jack labeled CONTROL UNIT.

Adjuncts

An adjunct is an auxiliary piece of equipment that adds features to the system, for example, a fax machine or an answering machine. See Table 5-5 for a list of adjuncts.

System Adjuncts

System adjuncts are auxiliary pieces of equipment that connect directly to the control unit.

Station Message Detail Recording Printer

A Station Message Detail Recording (SMDR) printer can be connected to the control unit at the SMDR jack on the processor module. The serial printer provides a list of all calls made by using the system.

System Programming and Maintenance PC

A PC with MS-DOS* version 3.3 or higher can be used for the programming and maintenance of the system. The PC is connected to the lower jack on the processor module (the system programming/maintenance jack).

Loudspeaker Paging Systems

Loudspeaker paging systems require a paging access module and/or paging unit such as the PagePac 20. The paging system must be connected to a ground-start or loop-start line/trunk port that has been programmed for paging, not to a station port. Figures 5-17 through 5-21 detail the system connections.

Note: A ground-start/loopstart (GS/LS) line port should be programmed for loop-start operation for paging equipment. If the loop-start port is programmed for paging, it cannot be used for outside calls unless a PagePac Port Saver is used.

The PagePac 20 with Zonemate 9 or Zonemate 39 is an external paging system using dual-tone multifrequency (DTMF) signaling that can be connected to a line/trunk port programmed for paging operation. Bidirectional paging or "talk back" is available. For paging systems with multiple zones, only one loop-start or ground-start line/trunk is required.

This system is compatible with the PagePac 20 Common Control Unit set to loop-start or ground-start operation, and a PagePac 6 Port Saver. The Port Saver allows the paging unit to be connected to the same loop-start line/trunk used for calls. Calls can be made and received when the paging unit is not active. The Port Saver is not compatible with ground-start lines/trunks.

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* MS-DOS is a registered trademark of Microsoft Corporation.
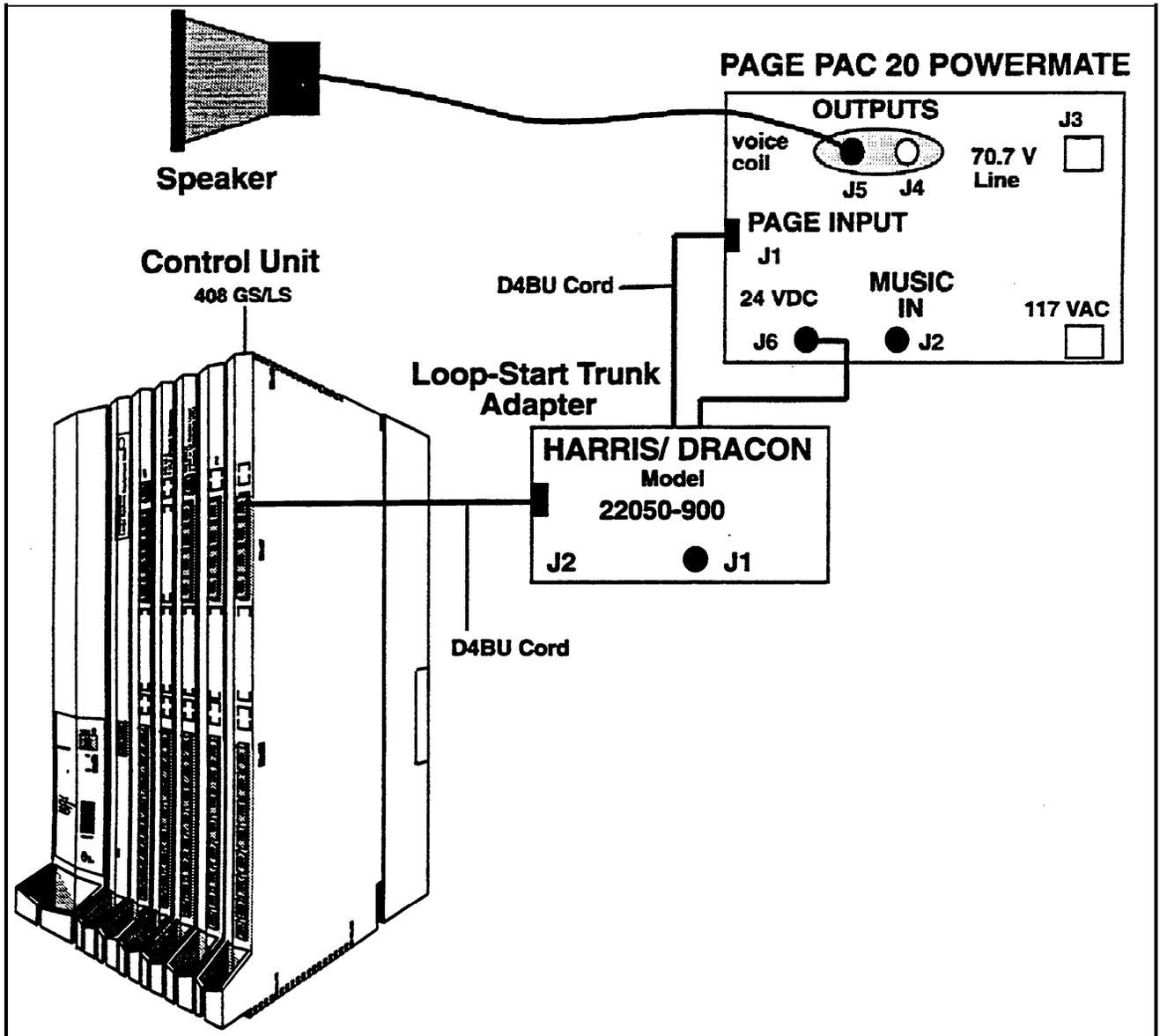
Figure 5-17   Single-Zone Paging with PagePac 20
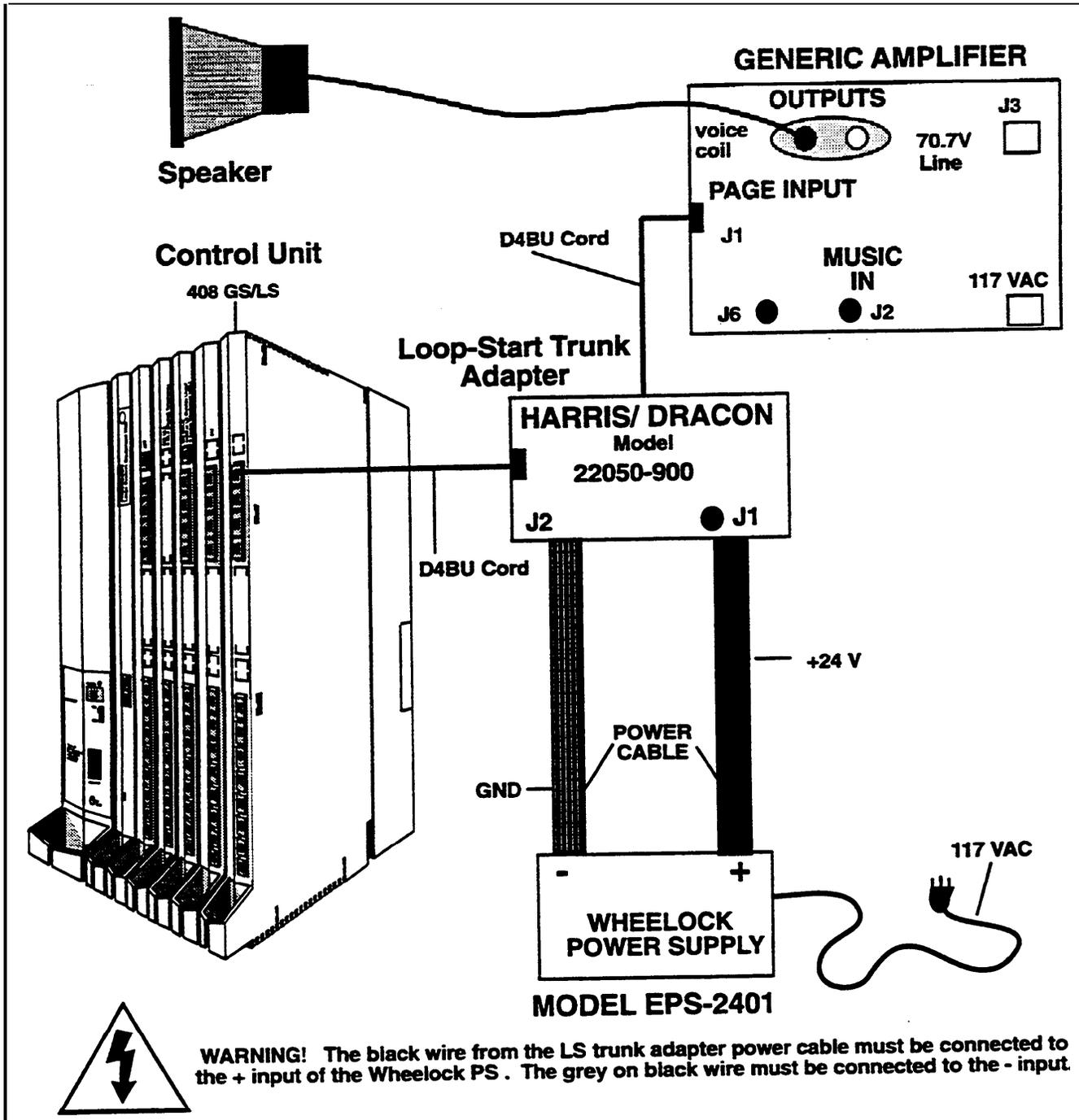
Figure 5-18   Single-Zone Paging with Customer-Supplied Amplifier
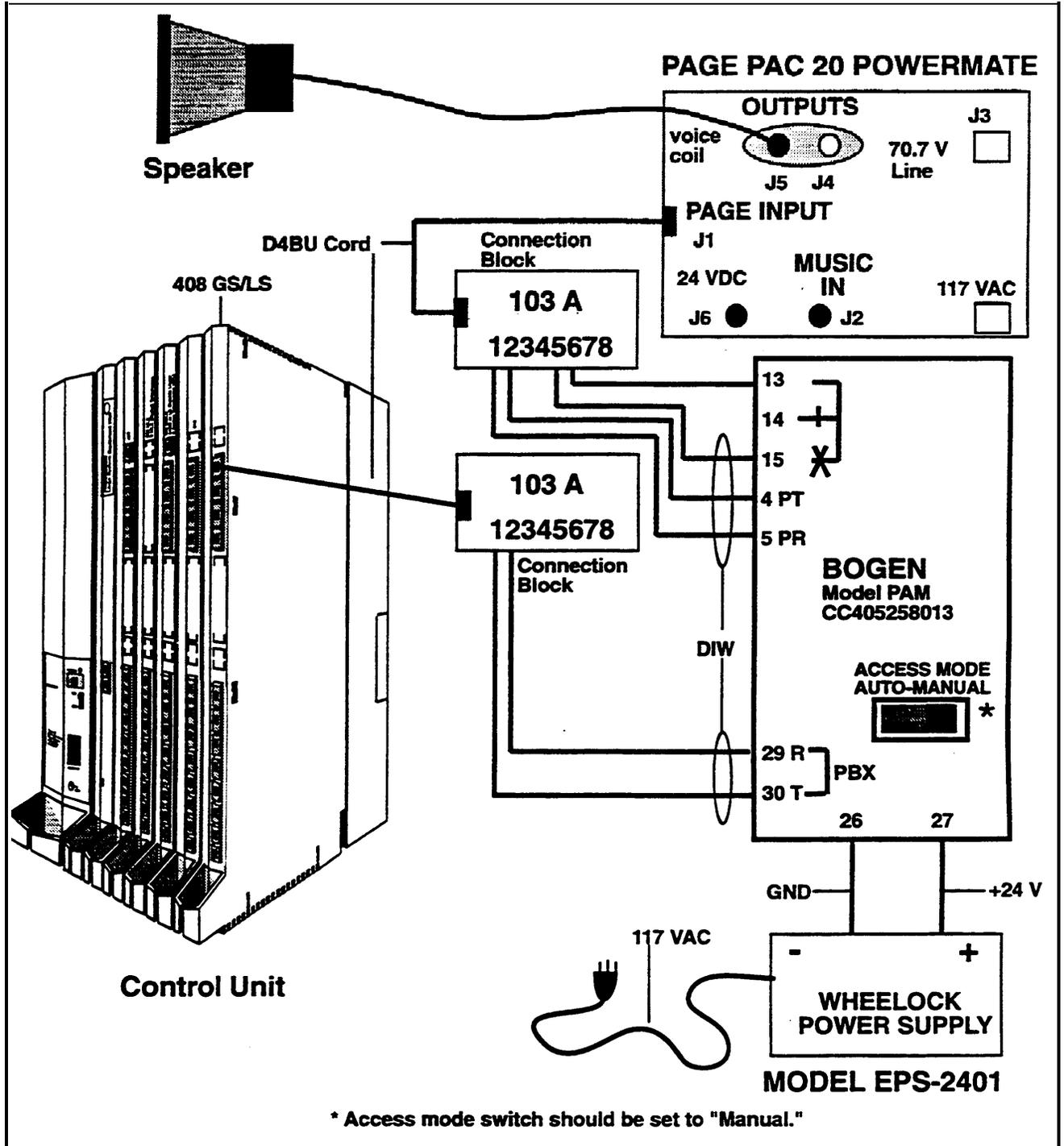
Figure 5-19   Single-Zone Paging with Paging Access Module
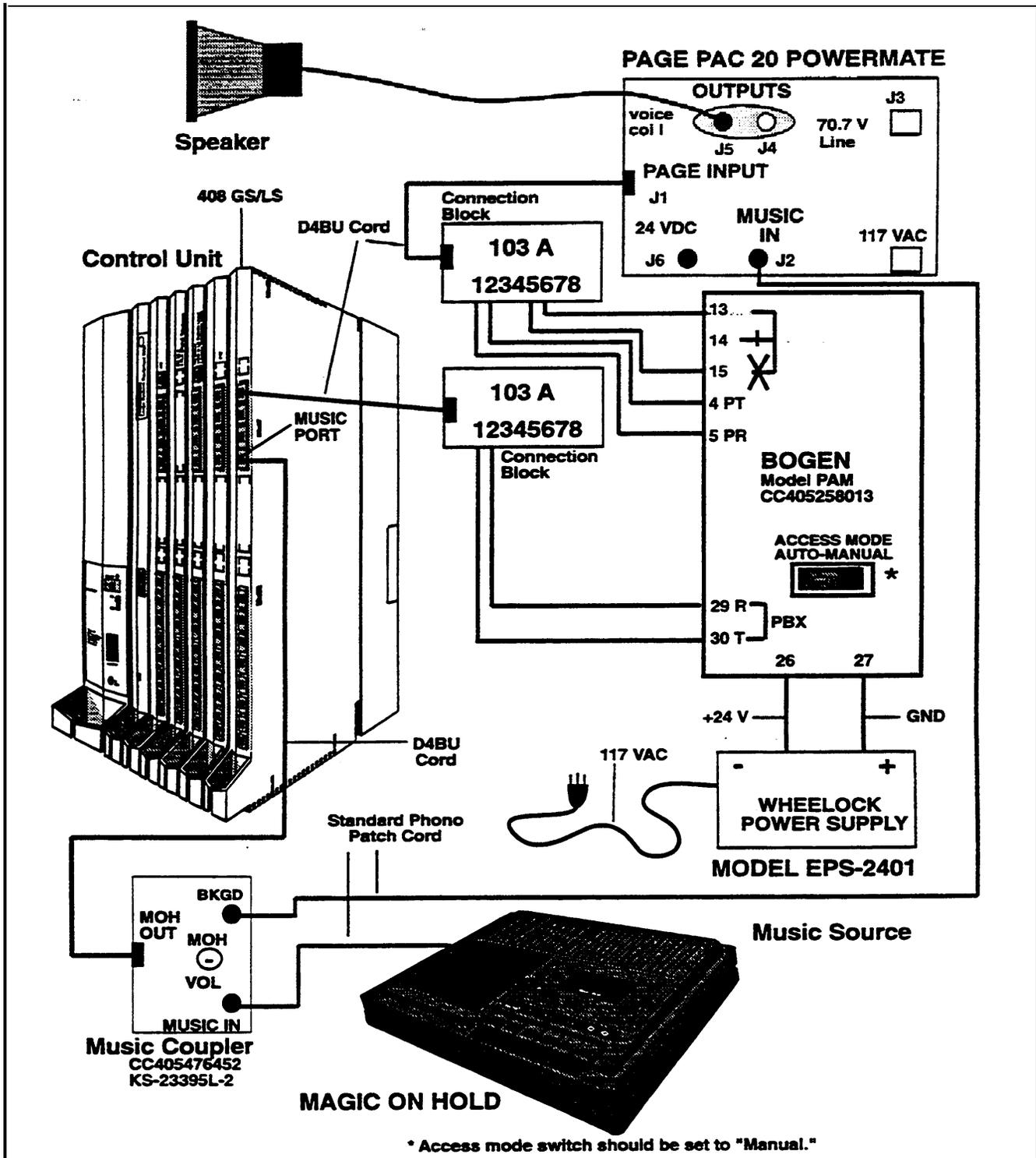
Figure 5-20   Single-Zone Paging with Background Music and MOH

PAGE PAC 20 POWERMATE
MODEL 22050-001

MUSIC IN
J2

PAGE INPUT
J1

117 VAC
J3

Control Unit

408 GS/LS

COMMON CONTROL UNIT
MODEL 22050-020

CK   LS

SWITCH

DL   GS

P1

PAGE INPUT
J101

J40

P3

ZONEMATE 9
MODEL 22050-029

ZONE 1 ZONE 2 ZONE 3 ZONE 4 ZONE 5 ZONE 6 ZONE 7 ZONE 8 ZONE 9

MUSIC
PORT

D4BU Cord

Speaker

Speaker

Standard Phono
Patch Cord

Speaker

Music Source

Speaker

BKGD

MOH
OUT   MOH

VOL

MUSIC IN

Music Coupler
CC405476452
KS-23395L-2

MAGIC ON HOLD

Figure 5-21   Multizone Paging with Background Music, MOH, and Talk-Back

**Music-On-Hold and the
Music Couple**

Background music can be provided for outside callers on hold or for selected areas of a building over the loudspeaker system.

Note: If equipment is used that rebroadcasts music or other copyrighted materials, the user may be required to obtain a copyright license from, and pay license fees to, a third party such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or a Magic on Hold™ system, which does not require the user to obtain such a license, can be purchased from AT&T or an authorized dealer.

Music can be heard by outside callers on hold by connecting a music source or Magic on Hold unit to a music coupler (see figure 5-21). The music coupler must connect to a loop-start port that has been programmed for Music-on-Hold (MOH) operation and must be used with an 8-ohm music source. The loop-start port cannot be assigned to a trunk pool, cannot appear as a programmed line on system telephones, cannot be connected to a loudspeaker paging system, and cannot be on a trunk port assigned to the QCC queue or to calling groups.

When a call is transferred, it is automatically connected to MOH if the system provides this feature.

The PagePac 20 also provides a music source for paging and MOH without a music coupler.
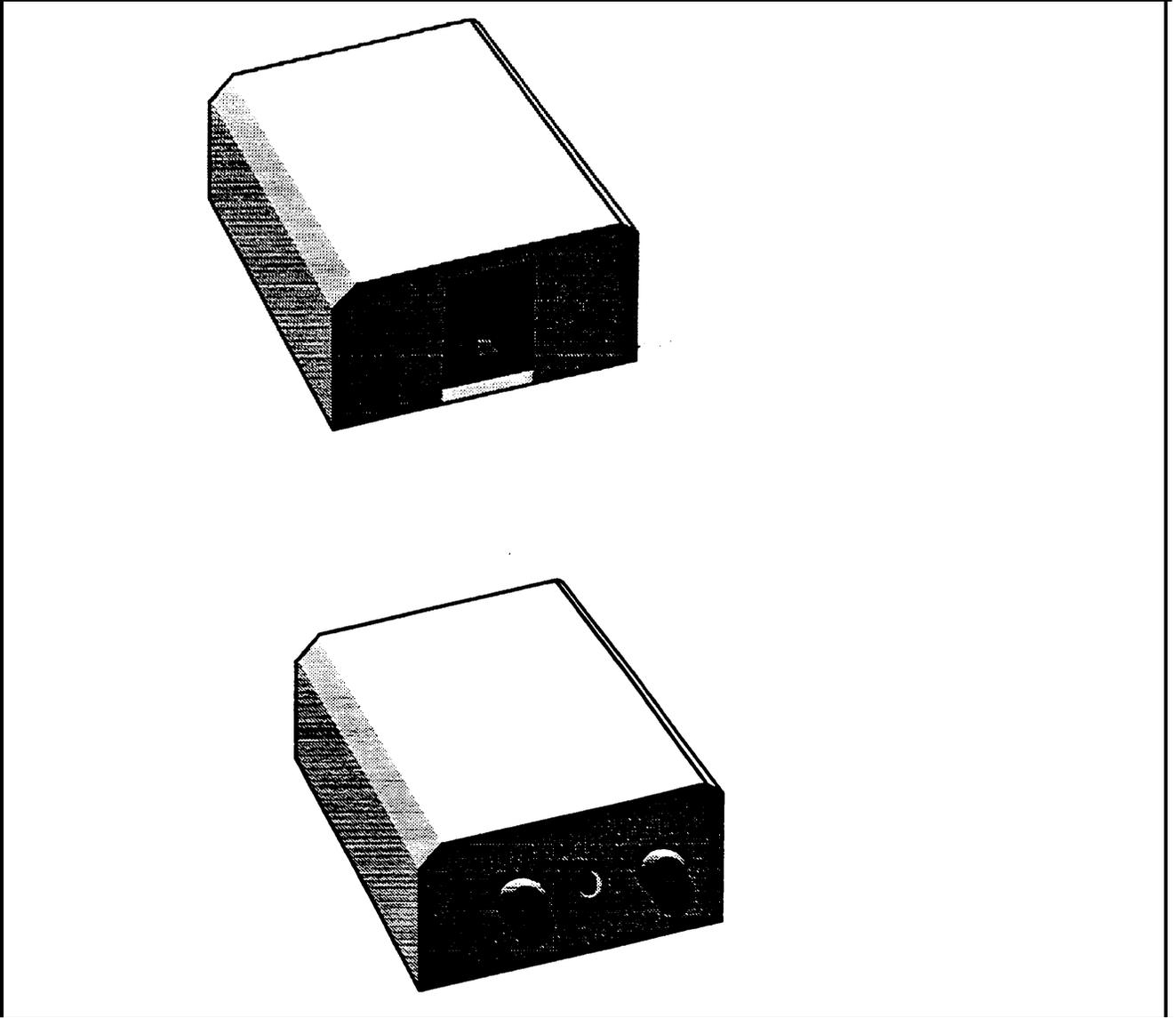
Figure 5-22   Music Coupler

Telephone Adjuncts

Telephone adjuncts connect directly to a telephone or through an adapter.

Direct Station Selector

The Direct Station Selector (DSS) is an optional adjunct that can be connected to an MLX-20L or an MLX-28D telephone. It enhances the capabilities of both DLCs and QCCs and, when connected to the MLX-20L telephone, facilitates programming.

A DSS has 50 buttons with lights that can be programmed with:

■ extension numbers

■ line/trunk numbers

■ pool dial-out codes

■ calling group extension numbers

■ paging group extension numbers

■ Park zone access codes

■ Automatic Route Selection (ARS) access codes

■ Remote Access dial code

■ Listed directory number (the extension for the QCC queue-Hybrid/PBX mode only)

These buttons are used by a system operator for one-touch dialing and call transfer. Ten additional buttons are located at the bottom of the DSS.

The 50 numbers programmed onto the DSS are considered a "page." The DSS can have three pages of numbers, for a total of 150 numbers per DSS. Two DSSs connected together increase this capability to 300 numbers. (If two DSSs are connected, page one has the first set of 100 numbers, page two has the second set of 100, and page three has the third set.)

For more information on programming Page buttons and the Messaging feature, see the direct-line console or queued call console operator's guide.

Three of the 10 lower buttons on the DSS are resewed as Page buttons to provide access to the different pages. The range of the numbers on the pages can be programmed to begin with any number up to 9950, but the default for the beginning numbers is 0, 50, and 100 respectively for the three pages. A fourth button is reserved as a Message Status button, which, when pressed, changes the indication of the DSS button lights from telephone use to Messaging. The other six buttons on each DSS are for future use.

Each control unit carrier provides enough power for two system operator consoles when each console has only one DSS. Additional consoles on the same carrier must have local power for DSSs. To power a console equipped with one DSS and an MFM, the KS22911L1 power supply is adequate. If there are two DSSs connected, a 329A wall power unit must be used. If the control unit carrier is already serving two consoles, each with a DSS, a third console connected to the same carrier also requires the 329A power unit.

Note: DSSs are shipped without local power supplies, which, if required, must be ordered separately.
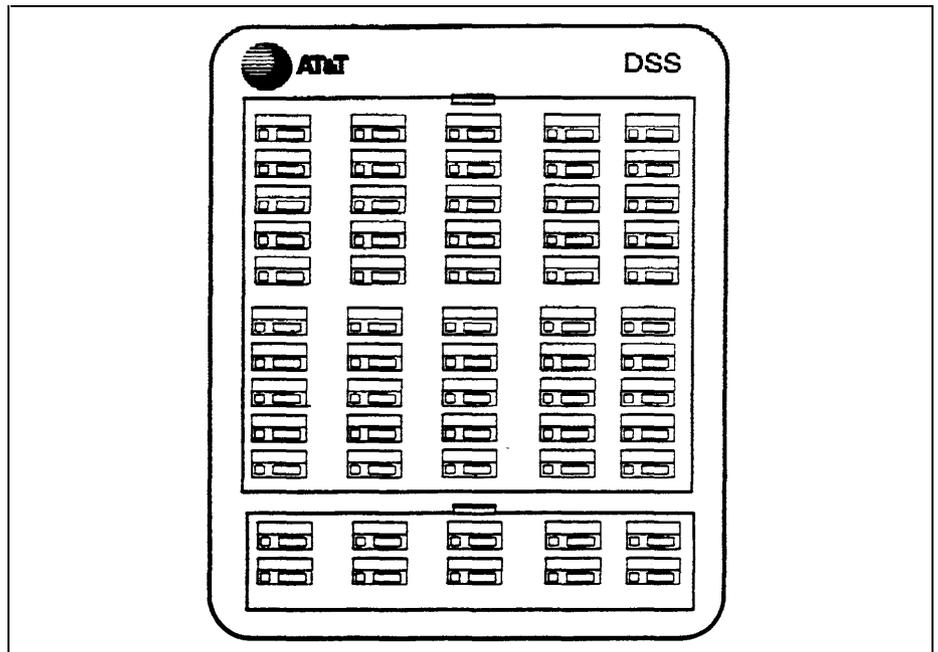
Figure 5-23 Direct Station Selector

Headsets and Headset Adapter

For details MLX telephone headset use, see Chapter 2, "Features."

Either the behind-the-ear or the over-the-head style of headset can be used with the system. Headset models used with the MLX telephones are plugged directly into the handset jack on the telephone (see Figure 5-24). The following headsets are compatible with MLX telephones:

■ StarSet* II—StarMate†-E (PEC3122-304A)

■ Supra†—StarMate-E

Note: When the headset's batteries are low, the headset produces three beeps in the earphone.

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* StarSet is a registered trademark of Plantronics Corporation.

† Supra and StarMate are trademarks of Plantronics Corporation
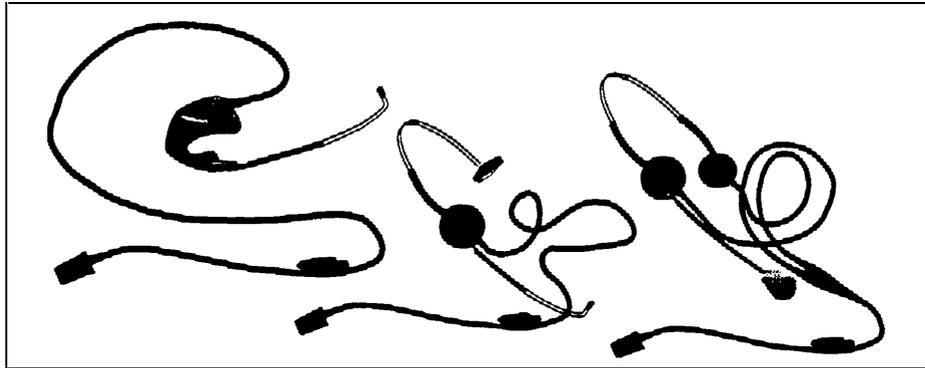
Figure 5-24   MLX Telephone Headsets

Headset models used with analog multiline telephones can plug directly into the handset jack on the analog multiline telephone or can plug into a headset adapter connected to the OTHER jack on the bottom of the analog multiline telephone. Various models of headsets can be used with a headset adapter: models 502A, 502B, or 502C. If adapter 502B or 502C in the enhance mode is used, an Auto Answer-All button must be programmed on the telephone.

These models plug directly into the analog multiline telephone handset jack:

■ StarSet II - StarMate E(PEC3122-204)

■ Supra - StarMate E
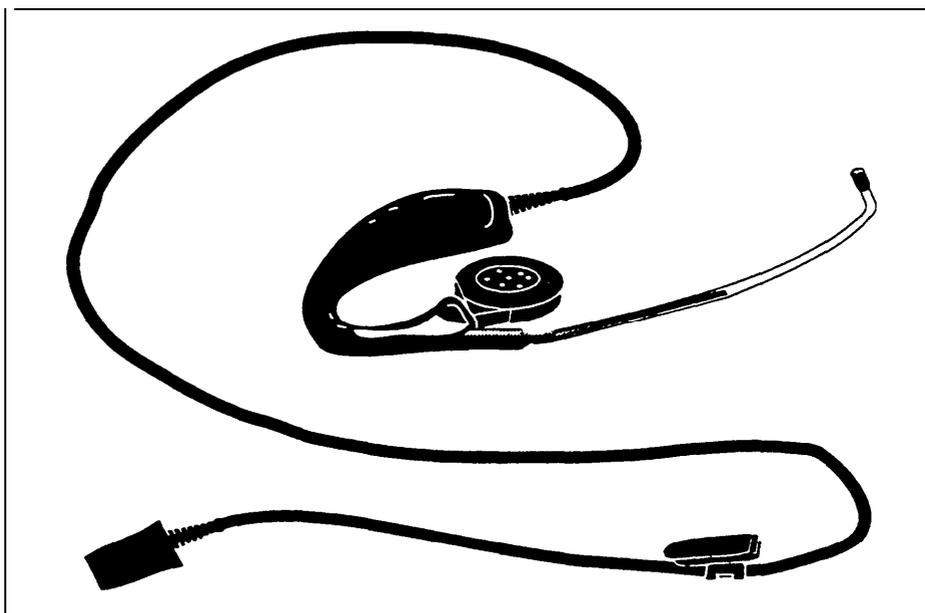
Figure 5-25   Analog Multiline Telephone Headset

Hands-Free Unit

Model S202A hands-free unit (HFU) for analog multiline telephones allows calls to be made and received without using the handset. If an Auto Answer-Intercom button is programmed on the telephone, the HFU goes on automatically when a voice-announced call is received.

Speakerphones

Separate speakerphones can be connected to single-line sets. The S203A speakerphone allows voice transfer without using the handset. The 4A speakerphone consists of a 108AA loudspeaker set, a 680-type transmitter, an 85B1 power supply, and a 223C connecting block.

The S203A speakerphone is compatible with any 2500 or 500 phone and requires its own local power. Newer units may be shipped with a transformer, but older units require a KS21239L4 transformer and 248B adapter to be ordered separately.

The 4A speakerphone must be used with a 2500SM telephone.

Note: The quality of speakerphone transmission can be affected by equipment in the area of the microphone.

Specialty Handsets

Handsets for users who are hard of hearing (model K6S) and for noisy environments (model K8S) are available for use with MLX telephones.

Other Adjuncts

Some adjuncts can be directly connected to station jacks but are not considered system adjuncts.

Dial Dictation

Dial dictation through a customer-provided dictation unit can be used as either a system or station adjunct. Some dictation units connect directly to the control unit via a T/R jack on the 012 module or 008 OPT module, or to a telephone using an MFM or a GPA. Other dictation units connect to a UPAM that is connected to a loop-start port programmed for dial dictation (similar to loudspeaker paging). The UPAM does not support dial dictation equipment requiring contact closure.

Message Waiting Indicator

The Z34A message-waiting indicator can be connected to single-line sets that do not have a Message LED.

Fax Machine

A fax machine can be connected to any T/R jack on the control unit or to an MFM. Using a fax machine with a GPA is not recommended because the fax machine cannot auto dial through the GPA. Instructions are packed with the unit.

A fax machine originates and receives fax calls independently of any associated telephone. Calls are dialed with the fax machine's dialpad or from an associated single-line telephone.

If the system doesn't have DID trunks, fax stations should be programmed to personal lines. When the system has DID service, incoming calls can be directed automatically to individual fax stations or to machines in calling groups.

Delay Announcements   Delay announcement recordings are used when there is a delay before an incoming call is answered (such as with calling groups). Announcements can be made with industry-standard announcement devices connected to a station port on a 012 module or a 008 OPT module, or by an interface such as an MFM or GPA.

Additional Adjuncts   Additional station adjuncts can be connected:

■ answering machines

■ cordless phones

■ credit card verification terminals

■ PCs (connected through modems, ISDN 7500B Data Modules, or directly with a built-in modem)

Adjuncts and Adapters Not Supported

⚠ **CAUTION:**

The following analog telephone adjuncts and adapters cannot be used with the system and in some cases will damage the device or the system if connected.

■ Basic Telephone and Modem Interface (BTMI)

■ Basic Telephone and Modem Interface-2 (BTMI-2)

■ ATR Interface (ATRI)

■ MTR Interface (MTRI)

■ Off-Premises Extension (OPX) Unit

■ System 25 Direct Extension Selector (DXS)

Table 5-5 Adjunct Summary

Equipment Type	Specifications	AT&T Products	PEC	Interface Required					Notes
				LS or GS/LS	T/R	MFM	GPA	SAA	
				Line Jacks	012 or 008 OPT Station Jack	MLX Station Jack	ATL Station Jack	ATL Station Jack	
Alerts (AC)	■ Any audible or visual alert that operates on 20—30-Hz ringing signals ■ A device associated with a specific station (supplemental alert) or that works on a programmed line/trunk port (external alert)	External ringer—loud External ringer	31016 31019		✔	✔	✔	✔	Cannot be connected to a QCC
Alerts (DC)	■ Any audible or visual alert that operates on 48-VDC ringing signals ■ A device associated with a specific station (supplemental alert) or that works on a programmed line/trunk port (external alert)	Alert bell Alert horn Alert deluxe horn Alert strobe Alert chime Alert switch	61212 61213 61223 61221 61222 61215	✔(1)		✔		✔	(1) Requires Universal Paging Access Module (UPAM) to provide 48 VDC
Answer/Record Machine	■ Industry standard machine ■ Low ringer equivalence (less than 0.15 or ≤ 1.0 total REN for T/R port) ■ Ability to recognize 600-ms disconnect signal, or other means of automatic disconnect (e.g., voice reset disconnect timer, fixed recording time)	Model 1330 Answering Machine Model 1531 Remote Answering System telephone	(1)		✔	✔	✔		Cannot be connected to a QCC (1) Must order through Sourcebook

Table 5-5   Continued

Equipment Type	Specifications	AT&T Products	PEC	Interface Required					Notes
				LS or GS/LS	T/R	MFM	GPA	SAA	
				Line Jacks	012 or 008 OPT Station Jack	MLX Station Jack	ATL Station Jack	ATL Station Jack	
Cordless Telephone	■ Must have touch-tone dialing capability when connected via MFM; rotary or touch-tone dialing can be used on T/R port ■ Single line	5320 Cordless Telephone 5200 Cordless Telephone 5500 Cordless Telephone	(1)		✔	✔ (2)	✔		Cannot be connected to a QCC (1) Must order through Sourcebook (2) Device originates and receives calls independently of associated telephone when used with an MFM. When a GPA is used, calls are dialed and received via the analog telephone
Credit Card Verification Terminal	■ Must have touch-tone dialing capability when connected via MFM; rotary or touch-tone dialing can be used on T/R port				✔	✔ (1)			Cannot be connected to a QCC (1) Device originates and receives calls independently of associated telephone when used with MFM
Dial Dictation	■ A device that requires contact closure can be used on LS/GS line jack only with UPAM			✔ (1)	✔	✔	✔		Cannot be connected to a QCC (1) UPAM required
Direct Station Selector	■ A maximum of two DSSs can be connected to a console ■ A 329A power unit must be added to a console having two DSSs ■ Connects to "DSS" jack on console		3156-DCB (black) 3156-DCW (white)						

Table 5-5   Continued

Equipment Type	Specifications	AT&T Products	PEC	LS or GS/LS	T/R	MFM	GPA	SAA	Notes
				Line Jacks	012 or 008 OPT Station Jack	MLX Station Jack	ATL Station Jack	ATL Station Jack	
Fax	■ Must have touch-tone dialing capability when connected via MFM; rotary dialing can be used on T/R port ■ Industry-standard analog interface	AT&T 3410D AT&T 3500D AT&T 3510D AT&T 3520D AT&T 3530D AT&T Fax 4515D AT&T Fax 4525D AT&T Fax 9015 AT&T Fax 9020 AT&T Fax 9022 AT&T Fax 9025FX AT&T Fax 9035FX	3509-PFX 3514-DFX 3510-DFX 3515-ADX 3512-SAF 3517-DFX 3516-DFX 3504 3505-902 3508-902 3502-HFX 3503-SFX		✔	✔ (1)			Cannot be connected to a QCC (1) Device originates and receives fax messages independently of associated telephone when used with an MFM
Group Calling Delay Announcement	■ Industry standard announce-ment device ■ Must provide automatic disconnect ■ Each calling group can have its own announce-ment (max-imum 32) ■ A device can provide delay announce-ment for more than one group	Model 1330 Answering Machine DA-5 Digital Voice Announcer			✔	✔ (1)	✔		Cannot be connected to a QCC (1) Device originates and receives calls independently of associated telephone when used with an MFM
Hands-Free Unit	■ For use with analog multiline telephones ■ Connects directly to telephone	S202A	3152-008						
Headset for analog multiline telephone		Supra (1) Starset II (1) Starmate E (2)	3122-011 3122-012 3122-013 3122-014 3122-001 3122-002 3122-003 3122-004 3122-204 3122-214						(1) Requires HFAI adapter (2) No adapter required
Headset for MLX telephone		Starset II— StarMate-E Supra— StarMate-E	3122-304A						No headset adapter required

Table 5-5 Continued

Equipment Type	Specifications	AT&T Products	PEC	Interface Required					Notes
				LS or GS/LS	T/R	MFM	GPA	SAA	
				Line Jacks	012 or 008 OPT Station Jack	MLX Station Jack	ATL Station Jack	ATL Station Jack	
Headset Adapters	▪ Need to program Auto Answer-All button for use with 502B, 502C ▪ Connect directly to telephone OTHER jack	502B 502C	62524 3164-HFA						
Loudspeaker Paging	▪ External paging system using DTMF signaling is connected to LS or GS line jack ▪ CPE paging systems require an interface unit; if CPE has 2-wire input, the BOGEN UPAM-K (58500) can be used.	PagePac 20 PagePac 20 with ZoneMate 9 (1) PagePac 20 with Zonemate 39 (1) PagePac 6 (2) PagePac 6 Plus	5323-005 53505 53506 5323-006 5323-008	✔ (1)					(1) Bi-directional paging is supported; only one line jack is needed for multizone paging (2) LS adapter (53518) is required when connected to LS line jack
Message Waiting Indicator	▪ For single-line sets ▪ Connects directly to telephone	Z34	31032						
Modem	▪ If the modem supports touch-tone dialing via the associated data terminal, the keyboard can be used for dialing ▪ If the modem does not support touch-tone dialing, an associated basic (single-line) telephone can be used for dialing	Modem Model 4000 Modem Model 2224G Modem Model 4024 Modem Model 2296A Modem Model 2296	2212-MUK (1) 2224-CEO (1) 2224-CDO (1) 2296-BAR (1) 2296-BDM (1)	✔ (2)	✔	✔	✔		(1) See Sales Manual for requirements (2) For modem model 2224G only

Table 5-5   Continued

Equipment Type	Specifications	AT&T Products	PEC	Interface Required					Notes
				LS or GS/LS	T/R	MFM	GPA	SAA	
				Line Jacks	012 or 008 OPT Station Jack	MLX Station Jack	ATL Station Jack	ATL Station Jack	
Music-on-Hold®	▪ Any FCC registered 8-ohm music source or recorded announcement device	Magic on Hold®	3128-010 (1)	✓ (1)					(1) Music Coupler required (61398)
Speakerphone	▪ Connect directly to telephone ▪ For single-line sets only	4A (1) 203A	3120-02W 3131-008						(1) Requires 2500SM telephone
SMDR Printer	▪ Connects to upper RS-232 jack on processor module ▪ Must be located within 50 feet of control unit or use ADU to extend distance	AT&T 475 AT&T 476 AT&T 572	3330-475 3330-476 3333-572						

● If you use equipment that rebroadcasts music or other copyrighted materials, you may be required to obtain a copyright license from and pay license fees to a third party such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or you can purchase a Magic on Hold system, which does not require you to obtain such a license, from AT&T or an authorized dealer.

Accessories

Accessories can be added to the system to provide more power and added protection from power surges. Other accessories apply to specific conditions.

Note: In most cases additional power surge protection is not needed.

Power Accessories

In a power failure, battery backup units can keep the system running for up to four hours.

When adjuncts and adapters are connected to telephones, the power requirements of the telephones and the communications system increase. Adding a power accessory to an individual telephone or to the system accommodates these additional needs.

Battery Backup Power

Battery backup for power to the system can be provided by an optional 500 VA uninterruptible power supply (UPS) and reserve UPS units. The basic UPS provides power for 15 minutes. Reserve UPS units provide power for one hour per supply.

The holdover back-up durations for normal system operation of one full carrier at a maximum system load areas follows:

15 minutes basic 500 VA UPS

1 hour   one 500 VA reserve cabinet for each UPS

2 hours   two 500 VA reserve cabinets for each UPS

4 hours   four 500 VA reserve cabinets for each UPS

Telephone Power Units

Connected between the telephone and the wall jack, the KS22911,Ll and 329A power units provide additional power to individual telephones that have adjuncts, adapters, and/or two DSSs attached, or to telephones far from the control unit. Adding local power to a few telephones can reduce the system load.

AKS22911 kit for MLX telephones comes complete with a D6AP cord, the KS22911,L1 power unit, and a 400B or 400B2 adapter. For analog multiline telephones, the KS22911 kit includes the KS22911, L1 power unit, a D6AP cord, and a Z400F adapter (PEC62510).

The 329A power unit (PEC31578) does not come in a kit, so the D6AP cord and the 400B or 400B2 adapter must be ordered separately.

The MFM comes complete with a D6AP cord, the KS22911 power unit, and a 400B or 400B2 adapter. DSSs are shipped without power units. Therefore, when DSSs require local power, the KS22911 or 329A power unit. D6AP cord, and 400B or 400B2 adapter must be ordered separately.

Note: Telephone operation without adjuncts is guaranteed for a wiring run up to 1000 cable feet from the control unit.

Auxiliary Power Units

When a power demand of over 54 unit loads is placed on one power supply module, an Auxiliary Power Unit 9024 is generally required and increases power by 27 unit loads. An auxiliary power unit is required when the unit loads on a carrier exceed 54.

To determine the number of unit loads for each power supply module on each carrier, see "Unit Loads" in Chapter 6 and Appendix H.

Note: Only one auxiliary power unit can be connected to the 391A power unit. If additional 48-VDC power is needed, connect some telephones to KS-22911 or 329A telephone power units.

Protection Accessories

Certain accessories are used for grounding and protecting special telephone connections from power surges, electromagnetic interference, and electrostatic discharge.

IROB Protection

Equipment connected to the analog multiline telephone station jacks (on the 008, 408, and 408 GS/LS/TTR modules) or to the MLX telephone jacks (on the 008 MLX module) that is located in a different building but within 1000 cable feet of the control unit requires IROB (in-range out-of-building) protection units. These units protect the equipment and the control unit from lightning strikes and power surges. Two units are required for each piece of equipment - one for the control unit end of the wire run, the other for the equipment end.

Note: No 012 basic telephone modules can be used in IROB applications.

Use the following IROB protectors:

■ TII Model 343 (PEC32918) for analog multiline telephones and equipment

■ AT&T Model 505A (PEC32919) for MLX telephones and equipment

⚠ WARNING:

The IROB protectors must be installed by an AT&T service technician or a qualified installer.
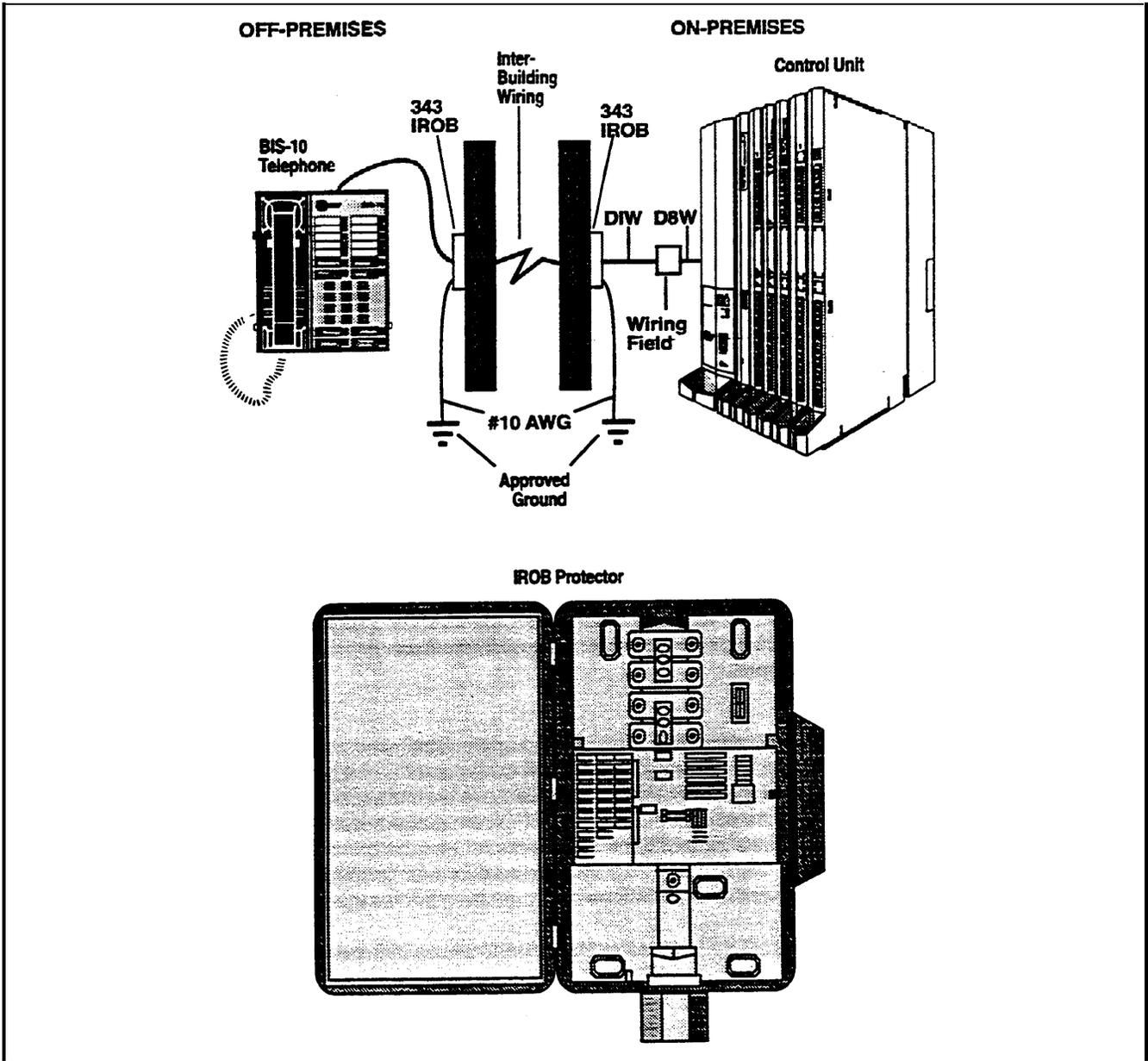
Figure 5-26   Analog IROB Connection
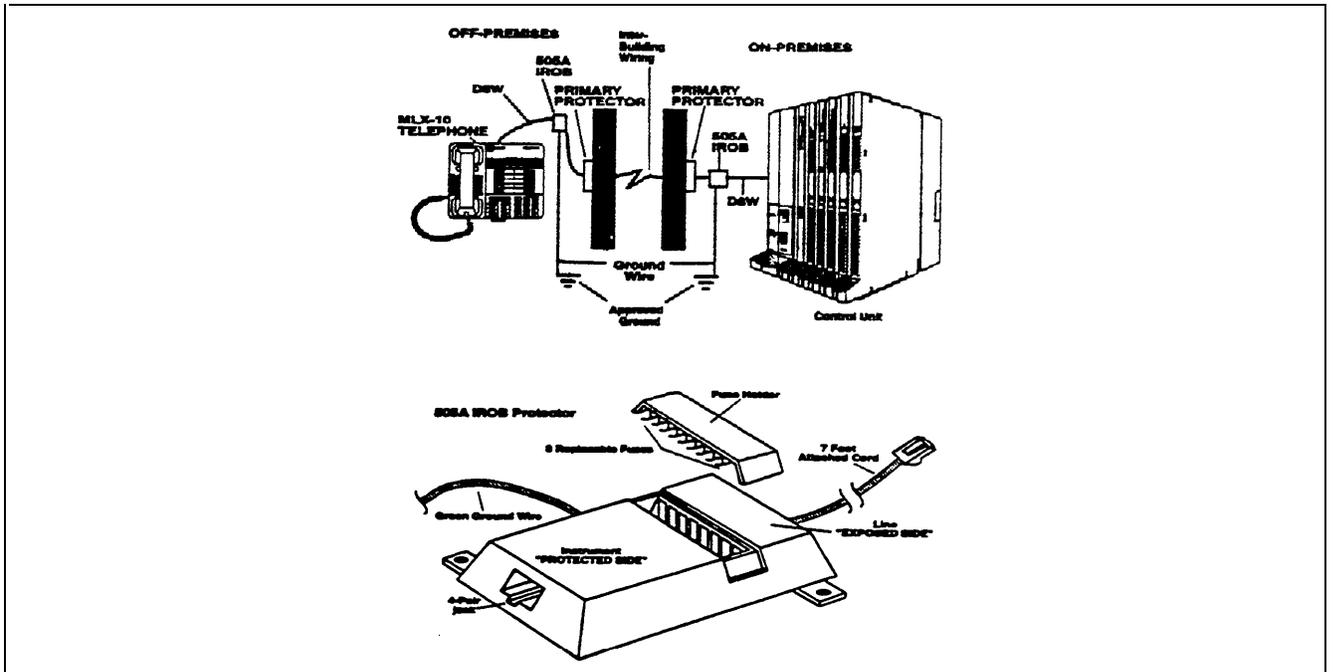
Figure 5-27   MLX IROB Connection

146A and 147A Surge Protectors

Protection from lightning and power surges is needed to safeguard system functioning.

It is the responsibility of the local telephone company to provide primary protection on the outside lines at the network interface and to ensure that these protectors are properly grounded. If the telephone company line protector is properly grounded and bonded to the AC power ground, most lightning damage will be prevented.

The 391A1 power supply module has built-in AC line protection. This built-in protection handles almost all situations.

Occasionally, additional AC line protection may be needed if the customer is located in a heavy lightning area. A 147A protector can be connected to the system to limit surges from the AC lines and outside lines. One 147A protector provides protection for four outside lines. Up to three 146A protectors can be added to the 147A to provide protection for a maximum of sixteen outside lines. For more than sixteen lines, additional 147A protectors are required (see Figure 5-26).

Note: The 147A protector is usually not needed with the 391A1 power supply module. It may be needed with the older 391A power supply module in high-risk lightning areas.

Installation instructions are provided with the protectors (CIB 3109 and CIB 3111).
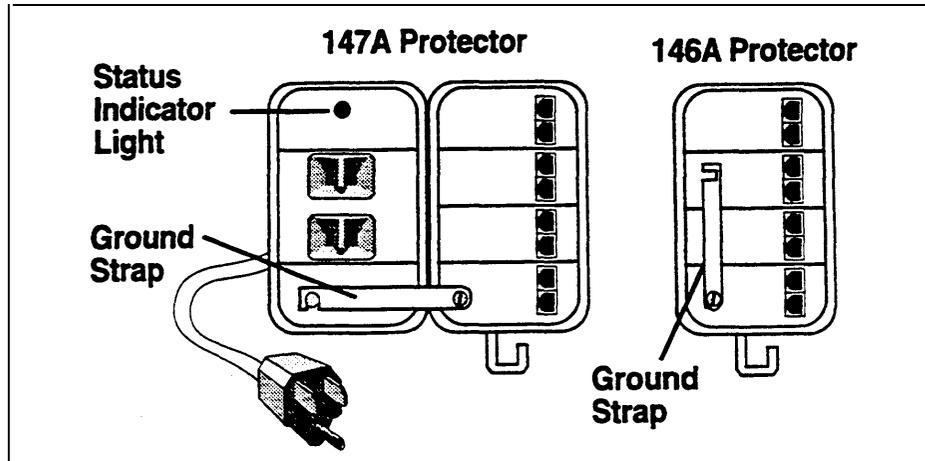
Figure 5-28   Surge Protectors

EMI Filter

The Z200A electromagnetic interference (EMI) filter can be connected to the system between the control unit and a telephone. Instead of a D8W cord, the filter cord is plugged into the telephone LINE jack.

ESD Suppression Kits

For more information, see the Customer Information Booklet included with the unit.

Electrostatic discharge (ESD) kits can be installed in older analog multiline telephones with membranes to eliminate damage to the telephone that can be caused by a voltage discharge resulting from electrostatic build-up. Each kit corresponds to a specific telephone:

■ D-181574

■ D-181589

■ D-181590

■ D-181591

■ D-181593

Miscellaneous Accessories

These accessories apply to specific conditions.

Power Failure Transfer Telephone

A power failure transfer (PFT) telephone is a single-line telephone connected to a PFT jack on a 400, 400/GS/LS/TTR, 800, 800 GS/LS, 408, or 408 GS/LS module. In the event of a power failure, the system shuts off and the PFT telephone automatically connects to the associated outside line for making and receiving call.

Note:
■ The PFT jack does not operate unless a power outage occurs or the power supply units are turned off.
■ A single-line telephone connected to an MFM cannot be used as a PFT telephone.
■ A ground-start button (see Figure 5-29) is required for each PFT telephone connected to a ground-start trunk. If power fails, this button is used when the number is dialed. If the button is used with modular 2500 sets, the button should be wired from the wall jack.
■ If rotary lines/trunks are used, rotary telephones must be used as PFT telephones.
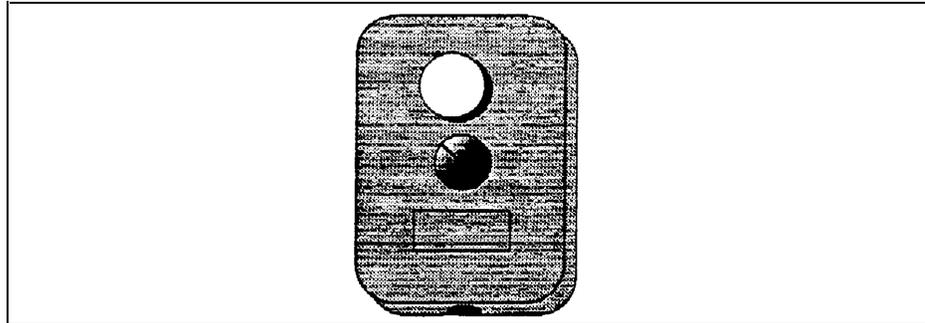
Figure 5-29   Ground-Start Button

Ring Generator

The 129B Frequency Generator (generator) must be added to the 391A or A1 power supply module when a 012 basic telephone module or a 008 OPT module is installed in the carrier. It provides a 105-VAC, 30-Hz ringing current used by the ringers on the single-line telephones connected to these modules.

System Capacities and Requirements

6

This chapter details the technical requirements and capacities of the communications system:

■ hardware and software capacities for the system

■ environmental requirements for placement of the control unit

■ power and grounding requirements for operating the system

Capacities

The system comes in two sizes, large and small. The large system supports up to 80 outside lines/trunks and 144 stations, such as telephones and fax machines, and the small system supports up to 24 outside lines/trunks and 56 stations. The size of the system is determined by its memory capacity - that is, the processor module (including the feature module) located in the control unit.

The large system has a total capacity of 224 jacks (80 outside lines/trunks plus 144 stations); however, each MLX module station jack supports two logical endpoints (station devices that can operate simultaneously and independently). For example, an MLX telephone with a Multi-Function Module (MFM) plugs into only one station jack, but the jack supports the telephone and the equipment connected to the MFM (such as a fax machine or an answering machine).

In a similar way, although the 100D module has only one jack, it can serve up to 24 endpoints (emulated lines/trunks or ISDN-PRI lines/trunks).

Thus, the entire large system can be configured to connect up to 80 lines/trunks and 255 station endpoints, a total of 335 endpoints.

Note: The system has a time-slot capacity of 216. If more than 216 endpoints are in use at the same time, blocking can occur.

The following table lists the hardware and software capacities of the system.

Table 6-1 Hardware and Software Capacities

Item	Small	Large	Constraining Factor
Allowed Lists			
■ Number of lists	8	8	
■ Entries per list	10	10	
■ Digits per entry	7	7	
Automatic Route Selection			
■ Number of ARS patterns	18	18	
■ Subpatterns per pattern	2	2	
■ Routes per subpattern	6	6	
■ Number of fully programmable ARS tables	16	16	
■ Entries per table	100	100	
■ Entries across all tables	1600	1600	
■ Default tables	4	4	
Callback			
■ Number of calls in queue	64	64	
Calling groups			
■ Number of groups	32	32	
■ Members per group	20	20	QCCs cannot be members.
■ Groups per member	1	1	
■ Delay announcements per system	32	32	
■ Delay announcements per group	1	1	
■ Groups per delay announcement	32	32	
■ External alerts per group	1	1	
■ Coverage groups per group	1	1	
Carriers	3	3	First slot of basic carrier used for processor module
■ Line/trunk and station module slots per basic carrier	5	5	
■ Line/trunk and station module slots per expansion carrier	6	6	
■ Maximum slots available for line/trunk and station modules	17	17	
Coverage groups			
■ Number of groups	30	30	
■ Senders per group	56	144	QCCs cannot be senders.
■ Groups per sender	1	1	
■ Receiver buttons per group	8	8	
■ Groups per QCC receiver	30	30	
Data hunt groups			
■ Number of groups	32	32	
■ Members per group	20	20	
■ Groups per member	1	1	

Table 6-1   Continued

Item	Small	Large	Constraining Factor
Direct Inward Dialing			
■ Number of blocks	2	2	
■ Number of trunks	24	80	
Directories			
■ System Directory			
■ Number of directories	1	1	
■ Listings per directory	40	130	
■ Extension Directory			
■ Number of directories	1	1	
■ Listings per directory	56	144	
■ Personal Directory			
■ Number of directories	16	48	
■ Listings per directory	50	50	
Disallowed Lists			
■ Number of lists	8	8	
■ Entries per list	10	10	
■ Digits per entry	11	11	
100D module	1	3	
Endpoints (devices)	56	255	
Fax machines with message-waiting	16*	16*	
Lines/Trunks	24	80	Small: RAM limit Large: Software real-time limit
Night Service			
■ Groups	8	8	
■ Members per group	56	144	
■ Groups per member	8	8	
■ Emergency Allowed List entries	10	10	
System operator consoles			
■ DLCs:			
■ MLX-20L or MLX-28D	6	8	2 per MLX module
■ BIS-22D, BIS-34, BIS-34D, or MERLIN II System Display Console	8	8	2 per analog module
■ QCCs	4	4	2 per MLX module
■ DSSs	12	16	2 per MLX module (built into MERLIN II System Display Console)
■ Combination of DLCs and QCCs	8	8	
■ Number of consoles per module	2	2	
Park codes			
■ Number of codes	8	8	

*   The system can support more than 16 fax machines, but those in excess of 16 cannot use the fax message-waiting indication.

Table 6-1 Continued

Item	Small	Large	Constraining Factor
Personal lines	56	64	
Pickup			
■ Number of groups	30	30	
■ Members per group	15	15	
■ Groups per member	1	1	
Pools (trunk groups)			
■ Maximum number of pools	11	11	
■ Maximum number of trunks in a pool	24	80	
Pool buttons	56	64	
Ports (not achievable simultaneously)			
■ Total	80	224	Small: RAM limit
			Large: Software real-time limit
■ Voice and data (physical ports)	56	144	Small: RAM limit
			Large: Software real-time limit
■ Voice Announce to Busy stations	28	127	RAM limit
■ Voice-mail interface	20*	20*	
■ Digital data via ISDN 7500B Data Module	24	127	RAM limit
■ Paging	3	3	Software real-time limits; loop-start only
■ Delay announcements	32	32	Software real-time limits
Remote Access			
■ Number of barrier codes	16	16	
■ Digits per code	4	4	
Shared System Access buttons			
■ Number of buttons per principal station	16	16	
Speed Dial			
■ Personal Speed Dial			Single-line and 5- or 10-button telephones
■ Entries per telephone	24	24	only
■ Entries per system	880	1200	
■ Digits per entry	28	28	
■ System Speed Dial			
■ Entries per system	40	130	
■ Digits per entry	40	40	
Stations			
■ Total physical jacks	56	144	
■ Total endpoints	56	255	
System programming equipment			
■ MLX-20L	1	1	Remote access overrides on-site
■ RS-232 jack (for connection of PC with SPM)	1	1	programming except during backup or
■ Modem	1	1	restore

* Although the system software supports up to 24 voice-mail interface (VMI) ports, all the VMI ports must be in the same calling group, and the maximum number of stations in a calling group is 20.

Table 6-1   Continued

Item	Small	Large	Constraining Factor
Telephones (not achievable simultaneously)			
■ Single-line	56	144	RAM limit
■ Analog multiline			Small: RAM limit
Without Voice Announce to Busy	56	136	Large: 17 slots x 8 ports/board
With Voice Announce to Busy	28	127	
■ MLX-20L	16*	48*	RAM limit
■ All other MLX telephones	24	127	RAM limit
(with or without ISDN 7500B Data Module or MFM)			
■ Power failure transfer	6	20	1 per 4 LS/GS trunk jacks
Traffic (hundred call seconds/hr/station)	7.0	6.0	Assuming 20% internal traffic
Two-party conversations	40	108	216 time slots
Voice-mail systems	1	1	

*   Total includes the MLX-20L telephone used for system programming.

Environmental Requirements

The control unit requires a regulated environment and can be located in any room or closet that is temperature controlled and clean. Do not mount the control unit where it will be exposed to direct sunlight.

In addition, the control unit should not be co-located with air conditioning or ventilation units, compressors, fans and blowers, heaters, arc welders, or other such machinery that produces electrical interference.

The control unit is mounted on a customer-provided plywood backboard. The backboard should be wide enough to accommodate additional carriers if system growth is anticipated. Allow enough space on either side of the control unit for any necessary wiring fields.

Once installed, it is important to keep the control unit site clear of hazards, such as stacked paper or boxes, that block ventilation. Installing any machinery in the vicinity of the control unit should be avoided. If any pollution-producing work (such as sanding or spray painting) is to be done in the area, care should be taken to protect the unit.

Following are the specific environmentals, space and location, and power requirements for the control unit.

Table 6-2   Control Unit Requirements

Operating Temperature	40° – 104°F; 4° – 40°C; optimum temperature 60°F
Humidity	20% – 80%
Airborne Contamination	Do not expose the control unit to moisture, corrosive gases, dust, chemicals, spray paint, or similar material.
Ventilation	Allow at least 1" on the right and left sides of the control unit and 12" of space above and below the control unit to prevent overheating. Do not place the control unit near extreme heat (furnaces, heaters, attics, or direct sunlight).
Electrical Fields	Do not expose the control unit to devices that generate electrical currents and cause interference (such as arc welders or motors).
Heat Dissipation	Fully loaded basic carrier — 500 Btu/hr Fully loaded basic carrier + 1 expansion carrier — 1000 Btu/hr Fully loaded basic carrier + 2 expansion carriers — 1500 Btu/hr
Control Unit Dimensions	Basic carrier — 14"W x 23"H x 12"D, 45 lbs Basic carrier + 1 expansion carrier — 25"W x 23"H x 12"D, 90 lbs Basic carrier + 2 expansion carriers — 37"W x 23"H x 12"D, 135 lbs

Table 6-2 Continued

Backboard Dimensions	Without SYSTIMAX® ■ small system (minimum needed) ■ large system (minimum needed) With SYSTIMAX ■ small system (minimum needed) ■ large system (minimum needed)	4'W x 3'H x 3/4"D 6'W x 3'H x 3/4"D 5'W x 4'H x 3/4"D 7'W x 4'H x 3/4"D
Backboard Mounting Hardware*	**Mounting surface:** Wood	**Hardware required:** Wood screws
	Concrete, brick, cinder block	Masonry anchors
	Plaster, plasterboard	Toggle bolts
	Sheet metal	Sheet-metal screws†
Location	■ Within 25 ft of network interface ■ Within 5 ft of dedicated AC power outlet (one plug per carrier and one plug for each auxiliary power unit) ■ Within 1000 cable ft of telephones	**Notes:** Multiline phones located in a different building but within 1000 cable feet of the control unit require IROB (in-range, out-of-building) protection units. IROBs protect the telephone and the control unit from lightning strikes and power surges. Additional outlets may be required if printers and PCs are installed with the system. The outlet(s) should not be switch controlled as this invites accidental disconnection of the system. Proper ground is required.

Power Requirements	Basic carrier
	  117 VAC, 60 Hz ± 5%, 3 A
	2-carrier
	  117 VAC, 60 Hz ± 5%, 6 A
	3-carrier
	  117 VAC, 60 Hz ± 5%, 9 A
		Note: The system will bridge a 40-ms power supply outage without DC voltages being affected.

Mean Time Between Failures	2.1 years (mean or average time the product/system is expected to operate before any type of failure occurs)	
Mean Time Between Outages	4 years (mean or average time the system is expected to operate before a failure affecting more than 25% of stations or lines for more than 15 seconds occurs)	

* The combined pullout force of the backboard should be at least 650 lbs.
† Attach sheet-metal screws to structural members.

Power and Grounding

Proper power and grounding are essential for correct and safe functioning of the system.

Power Specifications

The system control unit plugs into a 117-VAC outlet. To avoid accidental disconnection of the system, this outlet should not be controlled by a wall switch.

Each carrier unit requires its own power supply. Each power supply requires a maximum current of 3 amps. Therefore, if expansion carrier units are added to the system, extra AC outlets may be needed.

Grounding Requirements

Proper grounding of the installation site protects the system against

■ lightning

■ power surges

■ power crosses on outside lines/trunks

■ electrostatic discharge (ESD)

The telephone company is responsible for providing protection of outside lines/trunks at the entrance to the site. The protection should consist of

■ carbon blocks or gas discharge tubes connected to an approved ground

■ adequate bonding of the outside line/trunk protector ground and the power company ground

⚠ **WARNING:**
Improper ground can result in equipment failures and service outages. Veritfy that the AC power uses an approved ground for its primary ground, that all voltage-limiting devices are grounded to an approved ground, and that the ground is one of the approved grounds below.

Approved grounds are

■ The metal frame of the building

■ a metal water pipe connected to an underground water pipe that is in direct contact with earth

■ an electrode encased by at least two inches of concrete and located within and near the bottom of a concrete foundation or footing in direct contact with earth

■ a copper ring that encircles a building and is in direct contact with earth

For most surge occurrences, the following standard grounding requirements provide adequate lightning and power surge protection:

■ properly wired/grounded/bonded outside line protectors

■ properly wired/grounded AC outlet

■ properly grounded single-point ground bar

■ properly wired connection between single-point ground and power supply

Additional Power Surge Protection

The 391A1 power supply module has built-in AC line protection. This built-in protection handles almost all situations.

Occasionally, additional protection may be needed if the customer is located in a heavy lightning area. A 147A protector can be connected to the system to limit surges-from the AC lines and outside lines. One 147A protector provides protection for four outside lines. Up to three 146A protectors can be added to the 147A to provide protection for a maximum of sixteen outside lines. For more than sixteen lines, additional 147A protectors are required. (See Figure 6-1 for a typical 147A protector installation.)
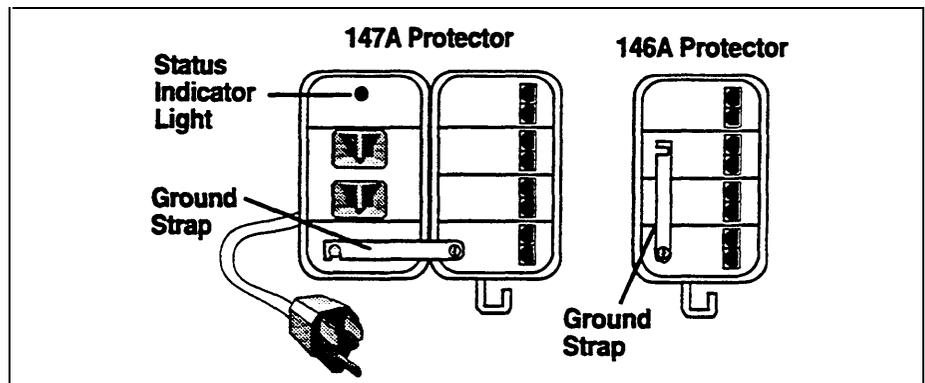
Figure 6-1   Surge Protection Units

Note: The 147A protector is usually not needed with the 391A1 power supply module. It may be needed with the older 391A power supply module in heavy lightning areas.

Complete installation instructions are provided with the protectors (CIB 3109 and CIB 3111).

Unit Loads

A unit load is a measure of power used to determine the electrical load on the power supply module caused by telephones, adjuncts, and DID modules. One unit load equals 1.9 watts.

Before installation, unit load and auxiliary power requirements for a new system are computed by AT&T service personnel or an authorized dealer and any necessary auxiliary power equipment is ordered automatically. However, in the event of maintenance or equipment changes, unit loads must be calculated to ensure proper operation under all conditions (see Appendix H for a unit load work sheet with specific unit load values).

The power supply module provides 54 unit loads to each carrier. If the unit load requirement per carrier exceeds 54, an auxiliary power unit (Auxiliary Power Unit 9024) is needed to allow the carrier to support an additional 27 unit loads.

Note: Running the system With more than 54 unit loads per carrier may not appear to do harm. However, this can cause the system to malfunction, creating "No Trouble Found" situations.

An auxiliary power unit redirects the power requirements from the last two slots on the carrier. Any station connected to the modules in the last two slots receives power from the auxiliary power unit instead of from the power supply module.

Besides DID trunks, only telephones and adjuncts that connect to analog and digital ports on the control unit require unit load calculations. Any equipment with its own power supply (for example, an answering machine, an MFM, or a fax machine) does not have to be included in the unit load calculation.

Unit Loads for the Hybrid/PBX Mode

The 391A1 power supply module generally supports six modules of any type in a Hybrid/PBX system. However, the unit loads on a carrier can exceed 54 if both of the following exist:

■ all six carrier slots have only MLX telephone or analog multiline telephone modules installed

■ the carrier has a total of more than 45 MLX-20L or 34-button analog multiline telephone stations installed

Unit Loads for the Key Mode

In a Key system with four or fewer port modules, no calculation is needed. The 391A1 power supply module generally supports four modules of any type in Key mode.

Calculating Unit Loads

To calculate the unit loads of each carrier, complete the work sheet in Appendix H.

Parts Information

The following table summarizes the equipment that can be connected to the communications system and provides associated ordering codes.

Component	PEC	Comcode	App Code
Control Unit			
Small (Analog)	6141-WA		
Basic carrier and housing		106388614	403E
Power supply module		105743801	391A1
Processor (small)		105711972	517A23
Feature module (small)		105711998	517A24
408 GS/LS		106064678	517A26
Small (Digital)	6141-CUD		
Basic carrier and housing		106388614	403E
Power supply module		105743801	391A1
Processor (small)		105711972	517A23
Feature module (small)		105711998	517A24
008MLX		105628010	517A21
800 GS/LS		105627996	517A19
Small (Digital)	6141-24D		
Basic carrier and housing		106388614	403E
Power supply module		105743801	391A1
Processor (small)		105711972	517A23
Feature module (small)		105711998	517A24
008 MLX (3)		105628010	517A21
800 GS/LS		105627996	517A19
400 GS/LS/TTR		105627988	517A18
Large	6140-CUL		
Basic carrier and housing		106388614	403E
Power supply module		105743801	391A1
Processor (large)		106215155	517A27
Feature module (large)		106064660	517A25

Component	PEC	Comcode	App Code
Upgrade from MII to Large (Digit)	6140-UDLA		
Cover		106368234	16A
Processor (large)		106215155	517A27
008MLX		105628010	517A21
Feature module (large)		106064660	517A25
MLX-20L telephone (choose one):			
Black		105685465	7713D01A-003
White		105685473	7713D01A-264
Expansion cover (zero, one, or two)		106368259	17A
Upgrade from MII to Large	6140-UULA		
Cover		106388234	16A
Processor (large)		106215155	517A27
Feature module (large)		106064660	517A25
Expansion cover (zero, one, or two)		106368259	17A
Upgrade from Small to Large	6140-USLA		
Processor (large)		106215155	517A27
Feature module (large)		106064660	517A25
Expansion Unit	61490		
Expansion carrier and housing		106388630	403F
Power supply module		105743801	391A1
Expansion unit cover	n/a	106388259	17A
Line/Station Modules			
008 (ATL)	61485	105351092	517B3
008 MLX	61486	105628010	517A21
008 OPT	61469	106387525	517A28
012 (T/R)	61487	106397631	517E13
100D (DS1)	61491	105461560	51A15
400EM (tie trunk)	8303-200	105311401	517A14
400 GS/LS/TTR	61483	105627988	517A18
408 GS/LS	61481	106064678	517A26
800 DID	61468	105628002	517A20
800 GS/LS	61484	105627996	517A19
Vintage Line/Station Modules			
400 (with TTRs)	61379	105408892	517B12
408 LS	61482	105512495	517C1
800 LS	61384	105351100	517B4
Telephones			
Digital/ISDN (MLX) Telephones			
MLX-10 (black)	3156-02B	105685440	7712D01A-003
MLX-10 (white)	3156-02W	105685457	7712D01A-264
MLX-10D (black)	3156-03B	105688303	7712D02A-003
MLX-10D (white)	3156-03W	105688311	7712D02A-264
MLX-20L (black)	3156-05B	105685465	7713D01A-003
MLX-20L (white)	3156-05W	10585473	7713D01A-264

Component	**PEC**	**Comcode**	**App code**
Digital/ISDN (MLX) Telephone, continued			
MLX-26D (black)	3156-04B	105666329	7713D02A-003
MLX-28D (white)	3156-04W	105668337	7713D02A-264
Analog Multiline Telephones (black)			
MLC-5	3168-MLC	105515332	7312H01A-003
BIS-10	3165-10B	105161061	7313H0IA-003
BIS-22	3166-22B	105168609	7314H0IA-003
BIS-22D	3166-DSB	105630420	7315H0IB-003
BIS-34	3167-34D	105167027	7317H01A-003
BIS-34D	3167-DSB	105630529	7317H0IB-003
Vintage Analog Multiline Telephones (black)			
5-button	3160-111	105217426	Z7302H01D-003
10-button	3161-172	105217509	Z7303H01D-003
10-button HFAI	3161-161	105371942	Z7309H01C-003
34-button	3162-412	103642050	Z7305H01B-003
34-button Deluxe	3162-417	105217715	Z7305H02D-003
34-button BIS	3162-BE	103961965	Z7305H03D-003
34-button BIS/DIS	3162-DIS	103961961	Z7305H04C-003
Single-Line Telephones			
Model 7102	3185-MWR		
Black		10535285	7102A01A-003
Misty cream		105330419	7102A01A-215
Model 2500 YMGK (message waiting, recall. touch-tone, desk)	3176-NHL		
Black		105460578	2500YMGK-003
Misty cream		105480560	2500YMGK-215
Model 2500 MMGK (recall, touch-tone, desk)	3101-ETR		
Black		105414130	2500MMGK-003
Misty cream		105414122	2500MMGK-215
Model 2500 MMGJ (touch-tone, desk)	3101-EBD		
Black		105414155	2500MMGJ-003
Misty cream		105414146	2500MMGJ-215
Model 2554 MMGJ (touch-tone, wall)	3101-EBW		
Black		105480081	2554MMGJ-003
Misty cream		105460032	2554MMGJ-215
Model 500 MM (rotary, desk)	3100-ORD		
Black		103670234	500MM-03
Ivory		103670226	500MM-50
Beige		103670267	500MM-60
Model 554 BMPA (rotary, wall)	3100-ORW		
Black		103623496	554BMPA-3
Ivory		103623506	554BMPA-50
Beige		103823555	554BMPA-60

Component	PEC	Comcode	App code
Consoles			
MERLIN II System Display Console	61392	105229744	7318H01A-003
DSS console (black)	3156-DCB	105665481	604A1-003
DSS console (white)	3156-DCW	105665499	604A1-264
Applications			
Call Accounting System (CAS)			
CAS Plus LEGEND	1201-DR1	406362244	
Custom Tariffż	12010	40615844	
CAS Plus upgrade	12009	406158394	
CAS/H			
CAS/H LEGEND 100S	1201-H10	405799255	
CAS/H LEGEND 200S	1201 - H20	405799289	
CASH Custom Tariff•	12050	405799420	
Call Accounting Terminal (CAT)			
CAT/B 150S	3600-023	406478800	
CAT/H 150S	3600-024	406478818	
CAT/B update (Custom Tariff)*	36023	408478792	
CAT/H update (Custom Tariff)*	36024	406478784	
Call Management System (CMS)	1207-100		
5 1/4" ffoppy disk		I06496540	
3 1/2" floppy disk		106496532	
Board	8301-100	108198815	
MERLIN LEGEND Integrated Solution II			
AUDIX Voice Power-IS II			
AVP2.1 for LEGEND	1234-VR1	106491808	
LEGEND Integ SW	1234-SR1	108491590	
IVP4SS R12	1234-BR1	108491616	
IVP4 Board LEGEND	8306-100	106248651	
Integrated Voice Power Automated Attendant			
SAA LEGEND	1234AA1	106491624	
IVP4SS R12 LEGEND	1234-BR1	106491616	
IVP4 Board LEGEND	8306-100	106246651	
Call Accounting System-IS II	1201-U12	406478537	
System Programming and Maintenance-IS II	61496	106498565	
MERLIN Attendant	6125-ATT		
Hardware		406221499	
Documentation		106431265	
MERLIN MAIL™ Voice essaging System			
Two-port	6107-005		
MERLIN MAIL unit		406467910	
Remote maintenance device		406466193	
Four-port	6107-006		
MERLIN MAIL unit		406467902	
Remote maintenance device		406466193	
Two-port line card (R2) (upgrade from two to four)	6107407	406464750	
System Programming and Maintenance (SPM)-MS-DOS	61495	106492655	

* Consult AT&T or an authorized dealer for other area-specific information.

Component	PEC	Comcode	App Code
Adjuncts/Adapters			
System Adjuncts/Adapters			
Auxiliary power Unit 9024	61416	406467142	9024
Channel service units (CSUs)			
ESF T1	2152-ESF	405616293	305010171-001
Cable (8 mod, wire wrp)	21555	406012609	513861312-505
Cable (8 mod, 15-pin sub)	21554	406012591	513823015-50 FT
Stand-alone wall mount	21545	405970104	380-100213-001
551 T1 L1	2152-15T	403768179	305-10097-001
Power unit	21530		
Unit		404242639	KS22911LI
Cord		103985660	DW4A-SE 10FT IP
Stand-alone wall mount	21545	405970104	380-100213-001
Cordless Telephones			
Model 5320	3103-CLS	105543516	CS6300U11A-229
DA-5 Digital Voice Announcer	62523	405745811	ANNCR-DA-5SLDI
Electrostatic discharge (ESD) suppression kits			
0-181574	n/a	105179329	D181574
D-181589	n/a	105201891	D181589
D-181590	n/a	105201909	D181590
0-181591	n/a	105201917	D181591
0-181593	n/a	105201933	D181593
EMI filter			Z200A
IROB unit — analog multiline•	32918	406106583	343 CA OA 6XIN
IROB unit — MLX•	32919	106417447	505A ASSY 0A WD
ISDN 7500B Data Module	2164-BDM	105657654	Z7500B-L1
Stand-alone power supply	21625	405509852	WP90110L7
Multiple mounting	21626	105441166	Z77A
7500A upgrade kit	21627	105688501	D182208
Magic on Hold player	3128-010	405143827	DECK-MMP/RCAPR
Modem 2224G	2224-CEO	105659965	2224C-L1D/2
Music Coupler	61398	406143925	ASSY-KS23395L3
PagePac 6	5323-006	405701277	22052-006 PG PC
PagePac 6 Plus	5323-008	405701606	22052-000 PG PC6
PagePac 20 Power Mate†	5323-005	403308026	ADP06
with three speakers	5323-001	403308067	ADP06
Ring generator unit	61388	105213201	129B RING GEN

• Any multiline off-premises telephone must have an appropriate IROB protector at the control unit location and at the off-premises location.

† Trademark of Plantronics Corporation

Component	PEC	Comcode	App Code
System Adjuncts/ Adapters, continued			
SMDR printers			
475 (80-colum, serial)	3330-475	403318942	475-8510BR2
476 (132-column serial)	3330-476	403818495	476-1550BR2
572 (80-column, serial)	3333-572	406152983	572-9500DR 10IN
Uninterruptible power Source (UPS)			
500 VA (15 minutes)	2403450	105610141	515UPS-005C111
Reserve (1 hour)	24035	105610174	ERC-W/BAT-005E5
Universal Paging Access Module (UPAM)	58500	405891696	KIT-UPAM
TAM B	n/a	406899972	D181900
PRS-48	n/a	405742735	D181900
WMT-1A	nla	405891680	0181900
ZoneMate 9	53505		
Dialer unit		404057911	DIAL UNIT-9ZONE
Control unit		405024134	CNTL 22050-020
ZoneMate 39	53506		
Dialer unit		404057929	39 ZONE SELECT
control unit		405024134	CNTL-22050-020C
External Alerts			
Loud external ringer	31016A	103117016	RINGER-L1AMP-49
E1CM-type	31019A		
Gray		102872934	RINGER-E1CM-49
Ivory		102917952	RINGER-E1CM-50
E1CM ringer and parts	61211		D-181233
Z90A adapter		102992252	290A ADPTR
Ringer		102872934	E1CM-49
Mounting plate		102988466	1049A
Cord		103938494	CORD-D4CH-87-25
Supplemental Alerts			
Bell	61212A	403349962	BELL-KS23053L1
Horn	61213A	403349970	KS23053L2
Deluxe horn	61223A	406207217	SIG THET4-1
strobe	61221A	403319197	STROB SCOPE
Chime	61222A	405136060	CHM-CHBT2 S1
Telephone Adapters			
General Purpose Adapter (GPA)	2301-GPA	103977997	Z1C
Multi-Function Module (MFM)	3156-MFM	105736474	540A1
Supplemental Alert Adapter (SAA)	2301-SSA	105031199	ADPTR-856A

<u>**Component**</u>	<u>**PEC**</u>	<u>**Comcode**</u>	<u>**App Code**</u>
Telephone Adjuncts			
Headset adapter	3164-HFA	105752042	ADPTR-502C-003
Headset adapter	62524	105471304	ADPTR-KS23552
Single-line telephones			
4A speakerphone	3120-02W		4A
Prover unit		102138838	PWR UNIT-85B1
Block connector		102434925	BLK CON-82B-49
Adapter for single-line telephone		102813888	ADPTR-223C
Adapter for multiline telephone		102849013	ADPTR-223D IP
Transmitter		103971891	TRMR-680AF-03
Black		103873873	LSPK-108AA-03
Ivory		103873881	LSPK-108AA-50
Green		103873399	LSPK-108AA-51
Beige		103873907	LSPK-108AA-60
While		103873964	LSPK-108M-58
S202A Speakerphone	3152-008		
Black		105721088	TEL-S202A-003
Misty cream		105721096	TEL-S202A-215
S203A speakerphone	3131-008		
Black		106058340	MOD-S203A-003
Misty cream		106058365	MOD-S203A-215
Bracket		106284011	BRKT-S203 WL ST
Message Waiting Indicator	31032	103966396	Z34A
Hands-Free Unit (HFU)	3163-HFU	103953790	MOD-S1O2A-185
Headsets			
Analog Multiline Telephones			
supra	3122-011	403350085	HDST-KS22990L1
	3122-012	403350077	HDST-KS22990L2
	3122-013	403350051	HDST-KS22990L3
Starset II	3122-001	403241540	HDST-KS22915L1
	3122-002	403241557	HDST-KS22915L2
	3122-003	403241565	HDST-KS22915L3
	3122-004	403350093	HDST-KS23080L1
StarMate E	3122-204	403412307	HDST-KS23080L4
	3122-214	403973431	HDST-KS23080L5P
Digital/ISDN (MLX) Telephones			
Starset II—startmte-E	3122-304A	405211723	HDST-KS23080L7
Supra-StarMate-E	n/a	n/a	HDST-KS23080L8

Component	PEC	Comcode	App Code
MLX Telephones — Miscellaneous Add-Ons/Replacement Parts			
Handsets and cords			
Handset (black)	n/a	106050065	K2S1-003
Handset (white)	n/a	106053408	K2S1-264
Handset, amplified hearing	31052		
Black		1055896	K6S2-003
White		106248248	K6S2-264
Misty cream		105581904	K6S2-215
Handset, amplified push to listen	31053		
Black		106382344	K8S2-003
White		106382369	K8S2-264
Misty cream		106382351	K8S2-215
Handset cord (9', black)	n/a	105635429	H4DU-0039
Handset cord (9', white)	n/a	105701809	H4DU-2649'BULK
Handset cord (12', white)	n/a	102402608	H4DU-26412'IP
Handset cord (12', black)	n/a	102401445	H4DU-3 12FT IP
Handset cord (25', black)	n/a	105523866	H4DU-3 25'
DSS line cord (2')	n/a	106187545	CORD D8AC-87
Desk Stands and User Trays			
Stand (large, black)	n/a	846320851	STAND-LARGE BL
Stand (large. white)	n/a	846320844	STAND-LARGE WH
Stand (small, black)	n/a	846320810	STAND—SMALL BL
Stand (small, white)	n/a	846320802	STAND-SMALL WH
User tray (black)	n/a	846320240	USER TRAY DWR B
User tray (white)	n/a	846320232	USER TRAY DWR W
Designation (Button Assignment) Cards and Covers			
Designation card• — MLX-10, MLX-10D	n/a	106448707	KIT-D182459 PRT
Designation card• — MLX-20L	n/a	106448723	KIT-D182461 PRT
Designation cardŽ — MLX-28D	n/a	106448715	KIT-D182460 PRT
Designation card set† — DSS	n/a	106448756	KJT SET DSS
Designation card covers†-DSS (black)	n/a	106448731	KIT-D182462 PRT
Designation card covers†-DSS (white)	n/a	106448749	KIT-D182463 PRT
Designation card set‡ — QCC	n/a	106561673	KIT-D182562 PRT
Designation card covers§ — MLX-10. MLX-10D, MLX-20L	n/a	106448681	KIT-D182457 PRT
Designation card covers§ — MLX-28D	n/a	106448699	KIT-D182458 PRT

Component	PEC	Comcode	App Code
Analog Multiline Telephones — Miscellaneous Add-Ons/Replacement Parts			
Desk Stands and wall Wall Mounts			
Adjustable desk stand,10o-button	32002	103746855	11A
Adjustable desk stand, 34-button	32003	103746863	110
Fixed desk stand, 5- and lo-button	32004	103746848	10A

Ž Twelve per package
† Includes both top and bottom cards or covers
‡ Eight cards per kit (four sets)
§ Four per package

Component	**PEC**	**Comcode**	**App Code**
Desk Stands and Wall Mounts, continued			
Desk stand/wall mount 14A, BIS-10	n/a	103804290	14A-003
Desk stand/wall mount 14B, BIS-22	n/a	103984458	14B-003
Desk stand/wall mount 14C. BIS-34	n/a	103979837	14C-003
Fiixed desk stand and wall mount, 5-button	000	103804290	10A
Kit of parts	32000	103995862	D-181230
Wall mount. 10-button	32001	103747846	201A
Kit of parts	32000	103995882	D-181230
Wall mount, 34-button	32006	103747853	203A
Kit of parts	32000	103995862	D-181230
Faceplates			
BIS-10	n/a	105203186	KIT PRTS-D181582
BIS-22	n/a	105336986	KIT PRTS-D181784
BIS-22D	n/a	105690762	D-182210
BIS-34 and BIS-34D	n/a	105203194	D-181583
Button label Sheets			
10-button BIS	n/a	105336978	D-181785
22-button BIS	n/a	105336960	D-181784
22-button BIS with display	n/a	105690770	D-182211
34-button BIS	n/a	105336956	D-181783
Display console (FM1) (includes one faceplate)	n/a	105299754	D-181727
Display console (FM2 & R3) (includes one faceplate)	n/a	105486252	D-182041
Single-Line Telephones — Miscellaneous Add-Ons			
Ground-Start Button			
KS23568L1	31021	405792839	Key-KS23566L1
Miscellaneous Parts			
Interconnect Wiring Kit			
110AB1-100JP12	nla	104409396	
110A1 trough	n/a	104407960	
D-Rings	n/a	842139246	
D8W cords	n/a	103786802	
Parts list	n/a	n/a	
SYSTIMAX™ MERLN® Wiring Kit	3103-MER	106393671	
110A1 trough (5)	n/a	10M07960	
110AB1-100JP12 modular block (2)	n/a	104409960	
110AB1-110 punch down block (1)	n/a	103823845	
D-Rings (6)	n/a	842139248	
110P8A5B patch cords	n/a	846619989	
(12—4-pair-5-ft. patch cords)			
D8W cords (24—14-ft.)	n/a	103786802	
Template	n/a	846613933	
Instruction sheet	n/a	846613941	
Parts list	n/a	846623924	

General Telephone Programming Instructions

B

This appendix describes how to program features on MLX and analog multiline telephones. Personal Speed Dial is the only feature that single-line telephone users can program. Therefore, general programming instructions for single-line telephones are not provided.

Note: Features cannot be programmed on queued call console (QCC) system operator positions. Features assigned to these consoles are fixed and cannot be changed.

Programming Methods

Telephones can be programmed by dialing programming codes or, on MLX display phones, selecting features from the display. An analog multiline telephone cannot be programmed by selecting features from the display.

To program a telephone, first enter programming mode. On analog multiline telephones, slide the Test/Program (T/P) switch on the side of the telephone to P, or lift the handset or press Speakerphone and dial #00. On MU-10 telephones, press the Feature button and dial 00. On MLX display telephones, use the same procedures as the MLX-10 or enter programming mode by selecting Ext Program [Prog] from the Menu screen on the display.

See System Programming for more infomation.

Note: Features can also be programmed onto individual telephones through centralized telephone programming.

The steps for using programming codes vary depending on the telephone. The following tables list the basic steps for programming each telephone type.

Programming Analog Multiline Telephones

Step	Action
1. Label the button **Note:** Skip this step if the feature does not get programmed onto a button.	■ Remove the clear label cover from the telephone by inserting the end of a paper clip in the notch at the top of the cover. ■ Write the feature name on the card next to the button to be programmed. ■ Replace the cover.
2. Begin programming	■ Slide the T/P switch on the side of the telephone to P.
3. Select the feature	■ Press the button you labeled. *If you have a display, it shows the name of the feature currently programmed on the button. If no feature is programmed, the display indicates the button is Blank.* **Note:** If the feature does not get programmed onto a button, press any line button. This does not affect the button in anyway. ■ Dial the programming code. *The feature is programmed.*
4. End programming	■ Slide the T/P switch to the center position.

Programming MLX-10 Telephones

Step	Action
1. Label the button **Note:** Skip this step if the feature does not get programmed onto a button.	■ Remove the clear label cover from the telephone by pulling upon the tab that extends from the top of the cover. ■ Write the feature name on the card next to the button to be programmed. ■ Replace the cover.
2. Begin programming	■ Press **Feature** then dial **00.**
3. Select the feature	■ Press the button you labeled. **Note:** If the feature does not get programmed onto a button, press any line button. This does not affect the button in anyway. Dial the programming code. *The feature is programmed.*
4. End programming	■ Press **Feature** then dial * **00.**

**Programming MLX
Display telephone Using
the Display**

Step	Action
1. Label the button to be programmed **Note:** Skip this step if the feature does not get programmed onto a button.	■ Remove the clear label cover from the telephone by pulling upon the tab that extends from the top of the cover. ■ Write the feature name on the card next to the button to be programmed. ■ Replace the cover.
2. Begin programming	■ Press **Menu.** ■ Select Ext Program [Prog] from the display. ■ Select Start from the display.
3. Identify the button to be programmed	■ Press the button you labeled. **Note:** If the feature does not get programmed onto a button, press any line button. This does not affect the button in anyway. *The display identifies the feature currently programmed on the button. If no feature is programmed, the display indicates that the button is Blank.*
❑ To delete the feature currently programmed on the button	■ Select Delete [Dlete] from the display. *The button is now blank.* ■ Press the button you labeled again to continue programming. **Note:** If the currently programmed feature was not deleted from the button, the new feature programmed onto it will replace it.
❑ To continue programming	■ Select List Feature [List] from the display. *The screen lists feature names.*

Continued

Step	Action
4. Select the feature	
❏ If the feature name is on the display	■ Press the button next to or below the name of the feature to be programmed.
❏ If the feature name is not on the display	
❏ To move through the list of features page-by-page	■ Press **More.**
or	
❏ To jump to the screen that displays the feature name	■ Select Find Feature [Find] from the display. ■ Select the range of letters from the display that corresponds *to* the first letter of the feature name (for example, if the feature begins with A, select **ABC).** ■ If the feature is not displayed on the page that you jumped to, press **More.** When you find the feature you want, press the button next to or below it.
5. Respond to any additional prompts on the display	■ Select appropriate prompt (for example, select On or Off to turn Inside Coverage on or off) and/or enter required information (for example, dial a phone number for Auto Dial). ■ Select Enter.
6. End programming	
❏ To return to the Home screen	■ Press **Home** or lift and replace the handset.
❏ To return to the Menu screen	■ Press **Menu.**

A Note About Programming MLX Display Telephones

MLX display telephones can also be programmed using the method described for MLX-10 telephones. For example, the programming mode can be entered by pressing Feature and dialing 00 and then referring to the display to continue the programming process. Or, enter programming via the display and then dial a programming code to select the feature rather than selecting it from the display.

General Feature Use Instructions

C

This appendix provides general instructions for how to use features on MLX, analog multiline, and single-line telephones.

Features can be used by

■ pressing a dedicated feature button

■ pressing a programmed button

■ dialing a feature code

■ selecting the feature from the display (MLX display telephones only)

Each of these methods is described below.

Dedicated Feature Buttons

All multiline telephones have a group of dedicated feature buttons that are programmed and labeled at the factory. The functions of these buttons, which include Conference, Transfer, and Speaker, cannot be changed. Press the button for the feature you want to use.

Programmed Buttons

See Appendix B, "General Telephone Programming Instructions," for more information on programming features onto line buttons.

Any unlabeled line button on multiline telephones can be programmed with a feature for one-touch activation.

Some features, such as Auto Dial, must be programmed onto line buttons in order to use them. Other features, such as Privacy, are best used if programmed onto line buttons - the LED next to the line button provides visual indication that the feature is in use.

The following features must be programmed onto line buttons:

■ Auto Answer All

■ Auto Answer Headset

■ Auto Dial

- Barge-In
- Coverage
    - Group Coverage
    - Primary Coverage
    - Secondary Coverage
    - Coverage
- Do Not Disturb
- Extension Status-Agent Login/Logout
- Feature Button (analog multiline telephones only)
- Headset/Handset Mute
- Headset Status
- Headset Hang Up
- Notify
- Posted Message (available from display on MLX display phones)
- Saved Number Dial
- Signaling

Feature Codes

Feature codes are 1-, 2-, and 3-digit codes that activate features. A feature code is used by first pressing the dedicated Feature button on MLX telephones or a programmed Feature button on analog multiline telephones, or by dialing # on single-line telephones. This sends a signal to the system that a feature code is about to be dialed. When the code is dialed, the feature is activated.

Note: Queued call console (QCC) system operators cannot use feature codes.

The following features can be used only by dialing feature codes:

- Call Waiting-Pickup
- Forward/Follow Me-Cancel One
- Forward/Follow Me-Cancel All
- Message Cancel
- Personal Speed Dial
- System Speed Dial

Note: Pressing the Conference, Transfer, Speaker, or Feature button while activating a feature cancels the process. Pressing any other button such as the Mute, HFAI, Message Status, DSS Page, More, Message, Clock, analog multiline display keys, or analog multiline disconnect button does not cancel the Feature activating process.

The Display

MLX display telephones provide another way to use features. The features are available from the Feature screen and the Menu screen. See "Display" in Chapter 2 for more information on using features from the display.

Programming Special Characters

D

When Personal Directory listings, Auto Dial numbers, Personal Speed Dial codes, and System Speed Dial codes are programmed, a sequence of numbers to be dialed automatically is stored. Some sequences require special characters to instruct the system to take a different action when dialing reaches the point where the character is stored. These characters signal the system to do things like **pause** for 1.5 seconds before dialing the next digit to allow time to receive dial tone or **stop** and wait until instructed to continue dialing, for example, so the user can enter a credit card number or password.

Each special character counts as one digit toward the maximum number of digits allowed in a stored dialing sequence.

Press...	Display Shows...	It Means...	Description
Hold	P	Pause	Each pause character included in a string of stored digits delays dialing the next digit by 1.5 seconds. The system automatically continues dialing programmed digits after the delay. Pause characters are entered using the **Hold** button. Pause characters are useful when an Automatic Route Selection (ARS) or pool dial-out code is included in a dialed number (Hybrid/PBX only); one or two pause characters must be programmed before the telephone number to allow time to receive dial tone from the local telephone company. As many pauses as are needed in the sequence can be inserted. For example, a user who must dial 9 before dialing an outside number can program a stored string as "9pp5551234;" the digits are dialed using the dialpad and the pauses are entered using the Hold button. in this example, the system dials 9, waits 3 seconds (two 1.5 second delays) and then automatically dials 555-1234.

Continued

Press...	Display Shows...	It Means...	Description
Drop	s	Sstop	Each stop character included in a string of stored digits stops the dialing sequence. The system does not continue dialing the rest of the digits after the stop character until instructed to do so by the user. Stop characters are entered using the Drop button. A stop character IS useful when specific digits must be entered, such as a credit card number, authorization code, or password, and the user must wait for a response or manually dial additional digits before additional numbers are dialed. In these cases, a stop character can be programmed between the credit card number, authorization code, or password and the additional digits to be dialed. For example, a user who must enter a password of "3862" and wait for a computer to respond before dialing a telephone number can program a stored string as "3862s7893456." In this example, when the Auto Dial button, Directory listing, Personal Speed Dial or System Speed Dial code is used, the system dials 3862 then stops. The system then waits until the user presses the Auto Dial button, selects the Directory listing, or dials the Personal Speed Dial code, or System Speed Dial code again before continuing to dial the rest of the programmed digits after the stop character.
Conf	f	Flash	Each flash character included in a string of stored digits simulates pressing the Recall button or switchhook to send a brief disconnect signal, often called a switchhook flash. The system automatically continues dialing the programmed digits after the flash character. Flash characters are entered using the Conf button. A flash character is useful when the business subscribes to special services, such as Centrex, that require a switchhook flash to activate custom features. The flash character is programmed as the first entry in the sequence of digits dialed and, for multiline telephones in the Key and Hybrid/PBX modes, the switchhook flash is sent to the telephone company central office to indicate that special features should be activated.
# #	#	End of Dialing	The end of dialing character programmed at the end of a string of stored digits indicates that all digits have been dialed and the system can process the dialed digits. The end of dialing character is used to indicate the end of the account code or, in the Hybrid/PBX mode when Automatic Route Selection is programmed, to indicate that the ARS routing process can begin. It speeds ARS call processing by eliminating the timeout delay while the system waits for more dialed digits before processing an ARS call.

System Programming Console Overlay

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E

</div>

The communications system is designed to allow programming from either an MLX-20L as a system programming console or from a PC with System Programming and Maintenance (SPM).

Using a system programming console may involve using the dialpad, some of the labeled function buttons on the lower portion of the console, and the 20 line and feature buttons in the center of the console. The line and feature buttons take on a different meaning when you are programming the system. Their functions are identified on the overlay for the console, as shown in Figure E-1.

Figure E-1   Console Overlay

Using a PC with SPM involves using the PC's monitor instead of the console's display. The SPM screen is arranged to look like the console's display, as the comparison between Figures E-2 and E-3 shows.

The window in the top area of the SPM screen matches the console's display area. The columns to the left arid right of the window describe keys that function in the same way as the buttons on either side of the console's display area.

The bottom area of the SPM screen simulates the 20 buttons in the center of the console and are identified on the screen as 01, 02, etc. The outside columns to the left and right of the "line buttons" describe the keys that function in the same way as pressing each line button. For example, pressing the Shift and F1 keys simultaneously is the same as pressing the lower left button on the console (see Figure E-1).

The labels on the top right side of the SPM screen (Drop, Trans, Hold) correspond to the buttons on the lower left side of the telephone.
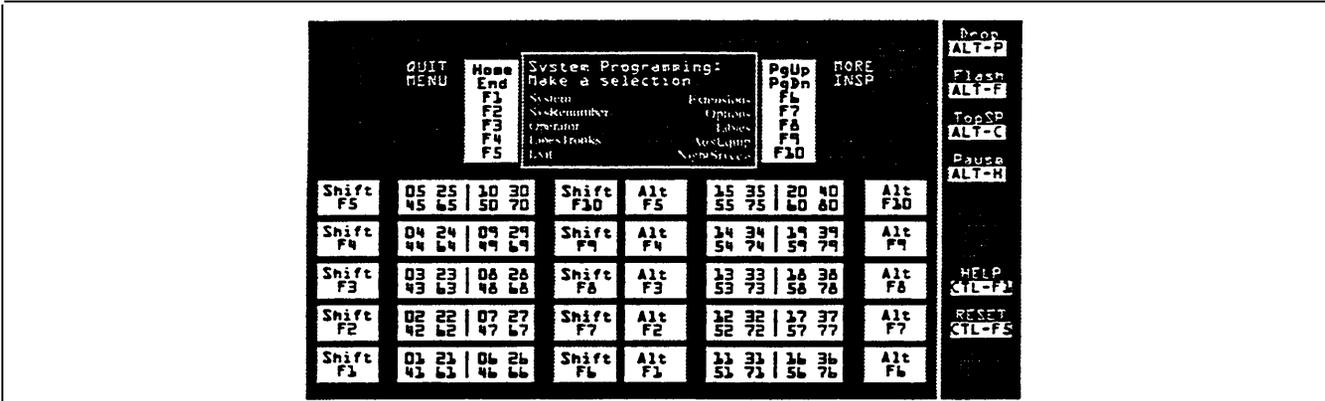
Figure E-2   SPM Screen
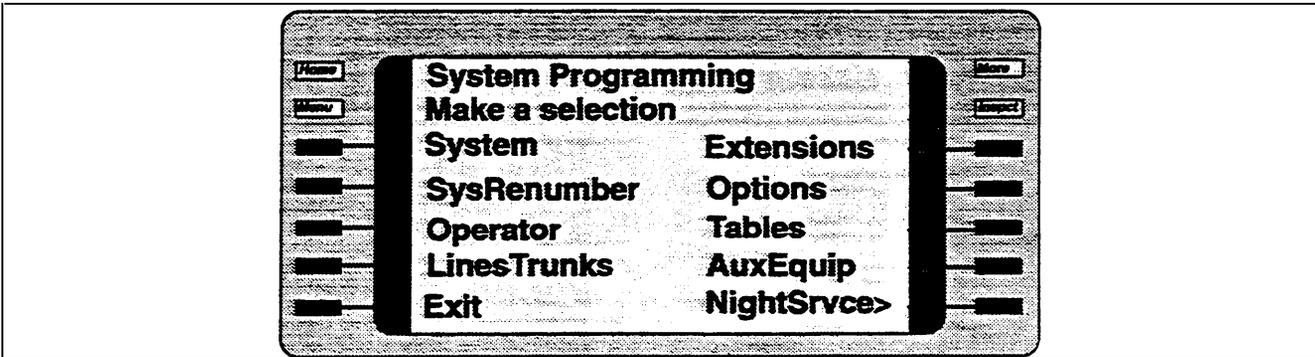
Figure E-3   System Programming Console Screen

System Programming Reports

F

This appendix describes the contents and shows examples of system programming reports. The reports can be generated by selecting the Print choice from the System Programming menu. If a PC with SPM is being used, the reports must be directed to the PC port by selecting "Print-Opts" from the SPM main menu then selecting "PC port" from the Printer Options screen. When reports are directed to the PC port, they can be printed on a printer connected to the PC (hard copy) or as a print file on either a hard disk or floppy disk. To view a print file, SPM must be exited and DOS commands must be used. If programming is being done from a remote location, exiting SPM also causes a disconnect from the control unit modem.

Note: System Programming and Maintenance reports should not be printed while the system is handling more than 100 calls per hour.

Table F-1   System Information

Report Name	Print Menu Choice	Description/Sample Report
System Information	SysSet-up	System-wide information such as return intervals, system mode, system programming port, slot assignments, Remote Access barrier codes and restrictions, etc.

Sample Report:

SYSTEM INFORMATION

```
Current Date:          11/26/90
Current Time:          09:45:10

System:   Mode        AutoMaintBusy    AutoBusyTie
     :    Hybrid/PBX   Enable           Enable

Direct Line Operators    : 20   24
Queued Call Operators    : 10   14
SysProg Port             : 13   Password :   COLT

Transfer:  Type     Audible         OneTouch (Complete)   ReturnTimer
       :   Ring     MusicOnHold     Transfer (Auto)       4 rings

Paging System Lines      : 809
Music on Hold Line       : 810
Camp On Time             : 90 sec
Call Park Return Time     : 180 sec
Delay Rings              : 2
Auto Callback Rings      : 3
Extension Status (ESS)    : Group Call / CMS
ESS Operators            : 20  24
SMDR:     Min.Call Time  CallReport      Format
     :         20 sec   In/Out          Basic

Intercom Dial Tone       : Inside
Reminder Service Cancel  : 18:00

Behind Switch Code:      Drop  Transfer   Conference
                    :

Recall timer             : 450 msec
Rotary Line Cut Through   : Delay
Unassigned Extension     : 10

Slot #      1:  008 MLX
Slot #      2:  408 GS/LS
.
.
.
Slot #      17:  Not Used
```

Table F-2 Dial Plan

Report Name	Print Menu Choice	Description/Sample Report
Dial Plan	Dial Plan	Extensions assigned to Pools, paging zones, Calling Groups, lines or trunks, and stations. Labels for lines/trunks, and stations.

Sample Report:

DIAL PLAN FOR POOLS
POOL # 1:   70

.
.
POOL # 11: 899

DIAL PLAN FOR TELEPHONE PAGING ZONES
TPZ # 1:   793

.
.
TPZ # 7:   799

DIAL PLAN FOR DIRECT GROUP CALLING GROUPS
DGCG # 1: 770   SALES

.
.
DGCG # 32: 7929

SYSTEM DIAL PLAN

DIAL PLAN FOR LINES/TRUNKS

LINE # 1:	801	CO	LINE # 2:	802	CO
LINE # 3:	803	WATS	LINE # 4:	804	WATS

(Information is included for all available line/trunk jacks in control unit.)

DIAL PLAN FOR STATIONS

STN # 1:	10	WAYNE	STN # 2:	11	MIKE
STN # 4	12	CONF	STN # 5:	13	MARY

(Information is included for all available station jacks in control unit.)

Table F-3   Label Information

Report Name	Print Menu Choice	Description/Sample Report
Label Information	Labels	Labels assigned to stations Posted Messages, and names and telephone numbers included in MLX-20L user's Personal Directory.

Sample Report:

LABEL INFORMATION

EXECUTIVE TELEPHONE # 10: Personal Directory

Name	Number	Display
TRAVEL AGENCY	555-1212	YES
HOME	555-1611	NO

EXECUTIVE TELEPHONE # 15: Personal Directory Not Used
      (shown if all entries in directory are empty)

(Information is included for all MLX-20L telephones connected to the system.)

MSG #	POSTED MESSAGE
1	DO NOT DISTURB
2	OUT TO LUNCH
3	AT HOME
.	
.	
20	CUSTOM MSG20

Table F-4 Trunk Information

Report Name	Print Menu Choice	Description/Sample Report
Trunk Information	Trunk Info	Options (e.g., type, signal, etc.) assigned to the lines, DS1 facilities, and other outside lines or trunks.

Sample Report:

TIE TRUNK INFORMATION

```
TRUNK  820 Slot/Port      : 3/ 2          TIE-PBX
Direction : 2 Way   E&M Signal  : Type 1S Dialtone   : Local
InType   : Immed  InMode       : Rotary  AnsSupvr  : 300 ms
OutType : Immed  Outmode      : Rotary  Disconnect : 200 ms
```

(Information is included for all tie trunk jacks in the control unit.)

DID TRUNK INFORMATION

```
Trk    SS/PP  Blk    DiscTime    Type ExpDig DelDig AddDig  Signal    InvDest
805    5/ 1   1      500ms       Wink  3      0              Rotary    BkupExt
806    5/ 2   1      500ms       Wink  3      0              Rotary    BkupExt
```

(Information is included for all DID trunk jacks in the control unit.)

GS/LS TRUNK INFORMATION

```
Trk    SS/PP  Type  Outmode     RelDisc  ChannelUnit
814    3/ 1   Ground TouchTone   N/A      ForeignExchange
815    3/ 2   Ground TouchTone   N/A      Foreign Exchange
```

(Information is included for all LS/GS line/trunk jacks in the control unit.)

GENERAL TRUNK INFORMATION

```
Trk    SS/PP  RemAccess    Pool  TlPrfx HldDsc PrncipalQCC PrtyQCC Oper
801    3/ 1   No Remote    770   No     Long   25          4       10
802    3/ 2   No Remote    770   No     Long   20          4       10
```

(Information is included for all line/trunk jacks in the control unit.)

Table F-5   DS1 Information

Report Name	Print Menu Choice	Description/Sample Report
DS1 Information	T1 Info	Options (e.g., line, signal, etc.) assigned to T1 trunks or lines.

Sample Report:

DS1 SLOT ATTRIBUTES

Slot	Type	Format	Supp	Signal	LineComp	Clksync	Src	Active
3	T1	D4	B8ZS	Rob_Bit	3	Prim	Loop	Yes

Table F-6   PRI Information

Report Name	Print Menu Choice	Description/Sample Report
PRI Information	PRI Info	PRI trunks/lines assigned to B-channel groups.
		Note: B-channel group numbers are from 1–69 and each may have up to 23 channel IDs. Empty B-channel groups are not printed.
		Sample Report:
		PRI INFORMATION
		BchnlGrp # 1 Slot: 2 TestTelNum : 5055551212 NtwkSvc:MegacomWATS
		Channel ID: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
		Line PhoneNumber NumberToSend 807 5055551122 5055551122

Table F-7 Remote Access

Report Name	Print Menu Choice	Description/Sample Report
Remote Access	RmoteAccess	Remote access dial code, class of restriction, barrier code information.

Sample Report:

REMOTE ACCESS (DISA) INFORMATION

GENERAL OPTIONS: ACCESS CODE : 889
Barrier Code required for Non-TIE DISA Lines : Yes
Barrier Code required for TIE DISA lines. : No
Automatic Queuing enabled for DISA lines : No

SYSTEM DEFAULT CLASS OF RESTRICTIONS (NON-TIE)
Restriction : OUTWARD RESTRICTED
ARS Restriction Level : 3
Allowed Lists : 1 2
Disallowed Lists : 1 2

SYSTEM DEFAULT CLASS OF RESTRICTIONS (TIE)
Restriction : UNRESTRICTED
ARS Restriction Level : 4
Allowed Lists : 1 2
Disallowed Lists : 1 2

BARRIER CODE ADMINISTRATION
Barrier Code Number : 1
Barrier Digits : 1234
Restriction : UNRESTRICTED
ARS Restriction Level : 4
Allowed Lists : 1 2
Disallowed Lists : 1 2

(Information for unassigned barrier codes is not printed.)

Table F-8   Operator Information

Report Name	Print Menu Choice	Description/Sample Report
Operator Information	Oper Info	For each system operator position, the logical ID, extension number, label, type (DLC or QCC) and all general system operator options such as back-up positions, etc.

Sample Report:

OPERATOR INFORMATION

OPERATOR POSITIONS

```
PORT                          CALL ALERT
ADDR.     EXT #  LABEL  TYPE  (QCC ONLY)
=====     =====  =====  ====  ===========
3/ 5      10     MIRIAM QCC   YES
```

GENERAL OPTIONS
    Length of hold reminder timer   : 20 sec
    DLC Automatic hold enabled   : YES

DIRECT STATION SELECTOR (DSS) OPTIONS:

```
BUTTON        FIRST
NUMBER        DIAL CODE
======        ==========
  1           0
  2           50
  3           100
```

    Operator Call Park codes: 881 882 883 884 885 886 887 888

QCC OPERATOR OPTIONS:

GENERAL OPTIONS:
Listed Directory Number for queue   : 800
Held calls return to queue   : YES
Automatic hold enabled   : YES
Calls-in-queue alarm threshold   : 10
Time until priorities are elevated : 6 sec
Message Center Operators   : 15
One Touch Extend   : AUTOMATIC
Rings before extended calls return : 4
Backup operator station   : 770

QCC CALL TYPES:

CALL TYPE	PRIORITY	OPERATORS
Dial 0 Operator	4	10 14 20 24
Follow Forward	4	N/A
Unassigned DID	4	10 14
Listed Directory Number	4	10 14
Operator's Extension	4	N/A
Returning	4	10 14 20 24
Group Coverage		
Group 1	4	10 14 20 24
Group 2	4	10 14 20 24
.		
.		
Group 30	4	

Table F-9   Allowed Lists

Report Name	Print Menu Choice	Description/Sample Report
Allowed Lists	AllowList	Telephone numbers included in Allowed Lists. Lists are numbered 0–7 and entries are numbered 0–9.

Sample Report:

ALLOWED LISTS

List: 0

Entry 0:	505555
Entry 1:	303555
Entry 2:	602555

.
.
.

| Entry 9: | —— |

.
.

List: 7

Entry 0:	——
Entry 1:	——
Entry 2:	——

.
.

| Entry 9: | —— |

(All lists including those with no entries are shown.)

Table F-10   Access to Allowed Lists

Report Name	Print Menu Choice	Description/Sample Report
Access to Allowed Lists	AllowListTo	Lists are numbered from 0–7. If the Allowed List is assigned to Remote Access users and barrier codes are used, the barrier codes are numbered from 0–16. If no barrier codes are used, 17 means the Allowed List is assigned to tie-trunk users and 18 means the Allowed List is assigned to non-tie-trunk users.

Sample Report:

ACCESS TO ALLOWED LISTS

FOR REMOTE ACCESS 17 & 18 MEAN TIE AND NON-TIE RESTRICTIONS

List 0   STNS   15 16 17 18 19 20 21

                 RACC   0 2 3 4 5 17 18

(Empty lists and empty entries on lists are not printed.)

Table F-11   Disallowed Lists

Report Name	Print Menu Choice	Description/Sample Report
Disallowed Lists	DisallowList	Telephone numbers included in Disallowed Lists. Lists are numbered 0–7 and entries are numbered 0–9. **Sample Report** DISALLOWED LISTS List: 0 Entry 0: 5055551611 Entry 1: PPP976 Entry 2: 6025551234 . . Entry 9: —— . . List: 7 Entry 0: —— Entry 1: —— Entry 2: —— . . Entry 9: —— *(All lists including those with no entries are shown.)*

Table F-12   Access to Disallowed Lists

Report Name	Print Menu Choice	Description/Sample Report
Disallowed List To	DisallowTo	Telephones to which Disallowed lists are assigned. Lists are numbered from 0–7. If the Disallowed List is assigned to Remote Access users and barrier codes are used, the barrier codes are numbered from 0–16. If no barrier codes are used for Remote Access, 17 means the Disallowed List is assigned to tie-trunk users and 18 means the Disallowed List is assigned to non-tie-trunk users. **Sample Report:** ACCESS TO DISALLOWED LISTS FOR REMOTE ACCESS 17 & 18 MEAN TIE AND NON-TIE RESTRICTIONS List 0 STNS 15 16 17 18 19 20 21 RACC 0 2 3 4 5 17 18 *(Empty lists and empty entries on lists are not printed.)*

Table F-13 ARS

Report Name	Print Menu Choice	Description/Sample Report
ARS	ARS	Table type, area codes and exchanges, subpattern A and subpattern B routes, FRL, absorb digit, delete digit and Dial 0 and N11 tables.

Sample Report:

AUTOMATIC ROUTE SELECTION

ARS IS: ACTIVE   ACCESS CODE: 9
TABLE 1: Area Code

01)303 02)505 03)602 03)619

Pool Absorb	Other Digits	FRL	Start	Pattern
1)70 2	12345	3	08:00	A
2)890		3	08:00	A

Pool Absorb	Other Digits	FRL	Start	Pattern
1)891	12345	3	17:00	B
2)70		3	17:00	B

(Above tables are numbered from 1-16. Empty tables, lines, and entries are not printed.)

TABLE 17: Default Toll Output Table

Pool Absorb	Other Digits	FRL	Start	Pattern
1)70 2	12345	3	08:00	A
2)893		3	08:00	A

Pool Absorb	Other Digits	FRL	Start	Pattern
1)891	12345	3	17:00	B
2)70		3	17:00	B

TABLE 18: Default Local Output Table

Pool Absorb	Other Digits	FRL	Start	Pattern
1)70 2	12345	3	08:00	A
2)894		3	08:00	A

Pool Absorb	Other Digits	FRL	Start	Pattern
1)895	12345	3	17:00	B
2)70		3	17:00	B

(Default tables 17 and 18 are also printed when ARS is not active.)

TABLE 19: Dial 0 Output Table

Pool Absorb	Other Digits	FRL	Start	Pattern
1)70 2	12345	3		
2)894		3		

(Default Table 19 is also printed when ARS is not active. The "Start" and "Pattern" columns are not used in this table.)

TABLE 20: N11 Table
01)411 02)611 03)811 04)911

Pool Absorb	Other Digits	FRL	Start	Pattern
1)70	12345	3		

(Default Table 20 is also printed when ARS is not active. The "Absorb," "Start," and "Pattern" columns are not used in this table. The entry in the "Pool" column is always the dial-out code of the main pool.)

Table F-14 Extension Directory

Report Name	Print Menu Choice	Description/Sample Report
Extension Directory	Ext Info	Slot/port, extensions, telephone type, button contents, features assigned, labels and restrictions, etc. included in Extension Directory. The column headings are printed on the first page only and are not carried over to subsequent pages.

Sample Report:

EXTENSION DIRECTORY

```
Port    Ext #    Label    F H R  M V R A  Port       Ext # Label  F H R  M V R A
Addr                      A B C  I S S R  Addr                    A B C  I S S R
                          C I F  C I T S                          C I F  C I T S
                          E S W  D G R R                          E S W  D G R R

3/ 5    15       WAYNE    N Y Y  N 1 U 3  3/ 6       16    ANN    N Y Y  N 1 U 3
```

*(The column headings
for these columns are
read from top to bottom.)*

(Information is included for all available station jacks in the control unit.)

Table F-15   System Directory

Report Name	Print Menu Choice	Description/Sample Report
System Directory	PblicDirect	System Speed Dial number, telephone number and label included in System Directory.

Sample Report:

SYSTEM DIRECTORY

Code	Name	Number	Display
600	Western Sup	15055551611	YES
601	Xanadu Inc.	15055552299	NO

(Speed Dial codes without names and telephone numbers are not printed.)

Table F-16   Group Paging

Report Name	Print Menu Choice	Description/Sample Report
Group Paging	Group Page	Extension number for each group and the extension number for each telephone assigned to the group. **Sample Report:** GROUP PAGING Group # 793 STNS: 10 15 18 19 22 *(Paging groups without members are not printed.)*

Table F-17   Extension Information

Report Name	Print Menu Choice	Description/Sample Report
Extension InformationExt Info		Type of equipment connected, features assigned to station, and features assigned to each button on the station.

Sample Report

EXTENSION INFORMATION

```
Extn      SS/PP    Type
          3/ 1     NT2 Enh

Pool Access  :  70  890  891
Auto Callback         : ON
Call Waiting          : OFF
Coverage Inside       : ON
Abbreviated Ring      : ON
Line Preference       : ON
Shared SA Ring        : OFF
Receive Voice Calls : ON

    Button 34    *21    Blank
    Button 33    *21    Blank
    Button 32    *21    Blank
    Button 30    *21    Blank
    Button 29    *21    Blank
    Button 28    *21    Blank
    Button 27    *21    Blank
    Button 26    *21    Blank
    Button 25    *21    Blank
    Button 24    *21    Blank
    Button 23    *21    Blank
    Button 22    *21    Blank
    Button 21    *21    Blank
    Button 20    *21    Blank
    Button 19    *21    Blank
    Button 18    *21    Blank
    Button 17    *21    Blank
    Button 16    *21    Blank
    Button 15    *21    9,1,5052471611
    Button 14
    Button 13
    Button 12    *40    15 -N
    Button 11
    Button 10
    Button 9
    Button 8
    Button 7
    Button 6
    Button 5
    Button 4           Line 802 -D
    Button 3           Line 801 -I
    Button 2    *16    Ext Voice -I
    Button 1    *16    Ext Ring -I
```

Table F-18   Group Coverage

Report Name	Print Menu Choice	Description/Sample Report
Group Coverage	GrpCoverage	Extension number for each group and the extension number for each telephone assigned to the group. Information is printed only for calling groups with members and/or lines/trunks assigned.

Sample Report:

GROUP COVERAGE INFORMATION

GROUP #: 1 SENDERS: 15 16 17 18 19 20 21

(Coverage groups with no senders are not printed.)

Table F-19   Group Calling

Report Name	Print Menu Choice	Description/Sample Report
Group Calling	Grp Calling	Group calling options (e.g., hunt, type, message waiting, station, etc.), the extension number for each telephone assigned to the group, and the lines or trunks assigned to the group.

Sample Report:

DIRECT GROUP CALLING INFORMATION

```
GROUP NO :              770 Group Type      :  AutoLogin
Call Distribution Type    : CIRCULAR
Delay Announcement Ext # : 35
Message Waiting Station   : 26
Calls_in_queue Threshold  : 5
External Alert ext #      :
Overflow Threshold        : 20
Overflow to DGC group #   : LDN
Group Coverage:  1  2  3

No.   EXT #LABEL
1     23    WAYNE
2     27    CAROL
.
.
.
20


LINES:     807  808  809  810
```

(Calling groups without members are not printed.)

Table F-20 Night Service

Report Name	Print Menu Choice	Description/Sample Report
Night Service	NightServce	The password required, time-of-day and Emergency Allowed list extension numbers.

Sample Report

NIGHT SERVICE INFORMATION

OPERATOR 10 STNS: 10 15 16 27 33 34 35 37

OPERATOR 14 STNS: 14 42 43 45

(Night Service groups without extensions assigned are not printed.)

Password: 3456

Current Day: Monday

	Turn off at:	Turn on at:
Sunday	:	:
Monday	08:00	17:00
Tuesday	08:00	17:00
Wednesday	08:00	17:00
Thursday	08:00	17:00
Friday	08:00	17:00
Saturday	:	:

(Time does not print if Night Service with time set is not programmed.)

Emergency Allowed List:
0)   911
1)   2471611
2)   0
.
.
.
9)

NS Excluded STNS :
12 13 14 15 16 17 22 23 25

Table F-21   Call Pickup

Report Name	Print Menu Choice	Description/Sample Report
Call Pickup	Call Pickup	Extension numbers for telephones assigned to each group. Pickup groups are numbered 1–30.

Sample Reports:

GROUP CALL PICKUP

Group # 1 STNS: 14 15 17 19 23 25 27

(Pickup groups without members assigned are not printed.)

The System Programming Menu Hierarchy

G

The system programming menu hierarchy is the sequence of menu screens that appear when the system Programming options are selected. The choice of an option on the first menu screen leads to either a second menu screen or a data-entry screen. A secondary menu screen may lead to still another menu screen, and soon up to six screens, as shown in the following pages.

The Inspect feature can be used during system programming to display the telephone or line/trunk numbers that are programmed with a specific feature. Inspect is helpful when a feature must be assigned to many lines/trunks or extensions and a Direct Station Selector (DSS) is not attached to the system programming console, or when a PC with SPM is being used for programming.

Inspect can be used for the menu options which have an asterisk (*) next to them. To use Inspect in system programming, **Inspct** or **PgDn** is pressed after the eligible menu option is selected.

System
Programming — | System — | Restart
                        SysProgPort
                        Mode — | Key
                                 Hybrid/PBX
                                 Behnd Swtch

                        Board Renum
                        MaintenBusy — | Enable — AutBsyTieTr — | Enable
                                        Disable   Disable
                        Date
                        Time

         SysRenumber — | Default — | 2-Digit
                          Numbering   3-Digit
                                      SetUp Space

                        Single — | Lines*
                                   Extensions*
                                   Pools*
                                   Group Page*
                                   Grp Calling*
                                   Adjuncts*
                                   Park*
                                   ARS DialOut
                                   RemoteAccs
                                   DSS Buttons*
                                   ListDirctNo

                        Block — | Lines
                                  Extensions
                                  Adjuncts

         Operator — | Positions — | Direct Line*
                                     Queued Call*

                      Queued Call — | Hold Rtm — | RtmToQue
                      Hold Timer   RmainOnHld

                                     HoldRelease — | Auto Hold
                                     Threshold   Auto Release
                                     ElvatePrior
                                     InQue Alert* — | InQueAlrtEn
                                                      InQueAltDis

                                     Call Types — | Dial 0 — | Priority
                                     Msg Center   Follow/Frwd   Operator*
                                                    UnassignDID —
                                                    ListedNumbr —
                                                    QCC Ext
                                                    Returning —
                                                    GrpCoverage —

                                     ExtndCompIt — | AutoCompIt
                                     Return Ring   ManualCmpl
                                     QCC Backup

                      DLC Hold — | Auto Hold Enable
                                   Auto Hold Disable

* The Inspect feature can be used with this menu option. Press **Inspct** or **PgDn**

G-2 The System Programming Menu Hierarchy

```
LinesTrunks  — | LS/GS/DS1  — | DS1        — | Type         — | T1            — | GroundStart
             |              |              |                |  PRI            |  Loop Start
             |              |              |                |                 |  TIE           — | TIE - PBX
             |              |              |                |                 |  Unequipped      |  Toll
             |              |              |                |                 |  All Ground
             |              |              |                |                 |  All Loop
             |              |              |                |                 |  All TIE       — | TIE - PBX
             |              |              |                |                 |  All Unequip     |  Toll
             |              |              |                |
             |              |              |  FrameFormat  — | D4 Compatible
             |              |              |                |  Extended Super Frame
             |              |              |                |
             |              |              |  Suppression  — | AMI-ZCS
             |              |              |                |  B8ZS
             |              |              |                |
             |              |              |  Signaling    — | Robbed Bit
             |              |              |                |  Common Channel
             |              |              |  Line Comp
             |              |              |  ClockSync    — | Priority      — | Primary
             |              |              |                |                 |  Secondary
             |              |              |                |                 |  Tertiary
             |              |              |                |                 |  None
             |              |              |                |
             |              |              |                |  Source       — | Loop
             |              |              |                |                 |  Local
             |              |              |                |
             |              |              |                |  Activation   — | Active
             |              |              |                |                 |  Not Active
             |              |              |  ChannelUnit  — | Foreign Exchange
             |              |                               |  Special Access
             |              |
             |              |  4xx GS/LS  — | GroundStart*
             |              |  8xx GS/LS  — | Loop Start*
             |              |               |  All Ground
             |              |               |  All Loop
             |
             |  TIE Lines  — | Direction   — | Two Way
             |              |               |  OutGoing
             |              |               |  Incoming
             |              |
             |              |  Intype     — | Wink
             |              |  Outtype    — | Delay
             |              |               |  Immed
             |              |               |  Auto
             |              |
             |              |  E&M Signal — | Type1S
             |              |  Inmode       |  Type1C
             |              |  Outmode      |  Type5
             |              |  Dialtone
             |              |  AnsSupvr
             |              |  Disconnect
             |
             |  TT/LS Disc — | OutMode
             |              |  LS Disconn
             |
             |  DID        — | Block
             |               |  Type        — | Immed
             |               |  Disconnect    |  Wink
             |               |  ExpectDigit
             |               |  DeleteDigit
             |               |  Add Digits
             |               |  Signaling   — | Rotary
             |               |                |  TouchTone
             |               |
             |               |  InvalDstn   — | SndToBkupEx
(Continued)                  |                |  RetrnFstBsy
```

*   The Inspect feature can be used with this menu option. Press **Inspct** or **PgDn.**

```
LinesTrunks  — | PRI        — | PhoneNumber
(Continued)                   | B-ChannlGrp  — | B-Channels*
                              | NmbrToSend     | Lines
                              | Test TelNum    | NetworkServ  — | MegacomWATS
                                                                | Megacom 800
                                                                | ACCUNET SDS
                                                                | Soft Def Netw
                                                                | Other

                                                | Copy Number  — | Copy
                                                                 | DoNotCopy

                              | Protocol     — | Timers  — | T200 Timer
                                               | TEI       | T203 Timer
               | Copy       — | Single                    | N200 Counter
                              | Block                      | N201 Counter
                                                           | K Counter
                                                           | T303 Timer
                                                           | T305 Timer
                                                           | T308 Timer
                                                           | T309 Timer
                                                           | T310 Timer
                                                           | T313 Timer
                                                           | T316 Timer

               | RemoteAccss — | LinesTrunks  — | Dedicated*
               | Pools                          | Shared*
               | Toll Type                      | No Remote
               | HoldDiscnct
               | PrincipalUsr   | Non-TIE     — | BarrierCode  — | Required
               | QCC Prior      | TIE Lines   —                 | NotRequired
               | QCC Oper
                                                | Restriction  — | Unrestrictd
                                                | ARS Restrict   | Outward Restrict
                                                | Allow List*    | Toll Restrict
                                                | DisallowLst*

                                | BarrierCode — | SProg/Maint
                                                | Codes
                                                | Restriction  — | Unrestricted
                                                | ARS Restrict   | Outward Restrict
                                                | Allow List*    | Toll Restrct
                                                | DisallowLst*

                                | Auto Queuing — | Enable
                                                 | Disable

Extensions   — | LinesTrunks
               | Line Copy   — | Single
               | Dial OutCd    | Block

               | Restriction — | Unrestrictd
                               | Outward Restrict
                               | Toll Restrict

               | RestrctCopy — | Single
               | Account*      | Block
               | BIS/HFAI*
               | Call Pickup*
               | VoiceSignl*
               | Ext Status*
               | Group Page*
               | Group Cover*
               | Grp Calling — | Hunt Type     — | Circular
               | ARS Restrct   | DelayAnnce       | Linear
               | Mic Disable*  | GrpCoverage
               | Remote Frwd*  | Message
                               | Queue Alarm
                               | Xtnl Alert
                               | Overflow
                               | Members*
                               | Line/Pool*
                               | Group Type    — | Auto Login
                                                 | Auto Logout
                                                 | Integ VMI
                                                 | Generic VMI
```

* The Inspect feature can be used with this menu option. Press **Inspct** or **PgDn.**

```
Options      —  Transfer       —  Return Time
                CampOn            One Touch     —  Transfer      —  Manual
                                                   Hold            Automatic
                CallParkRtn
                Delay Ring
                Callback          Audible       —  Music-On-Hold
                                                   Ringback

                                  Type          —  VoiceAnnce
                                                   Ring
                Ext Status     —  Hotel
                                  GrpCall/CMS

                SMDR           —  Format        —  Basic SMDR
                                  Call Length      ISDN SMDR

                                  Call Report   —  In/Out
                                  New Page         Out Only

                InsideDial     —  Inside
                Remind Svc        Outside

                Unassigned     —  QCC Queue
                                  Extension
                                  Grp Calling

                BehndSwitch    —  Transfer
                                  Conference
                                  Drop

                RecallTimer    —  350 ms
                                  450 ms
                                  650 ms
                                  1 sec

                Rotary         —  Delay
                                  No Delay

                Cover Delay

Tables       —  AllowList
                AllowTo
                Disallow
                DisallowTo
                ARS            —  ARS 1+7Dial   —  WthnAreaCod
                                                   NotWthnArCo

                                  ARS Input     —  6-Digit
                                  Sub A Pools      Area Code
                                  Sub A FRL        Exchange
                                  SubA Absorb      1+7
                                  Sub A Digit
                                  Sub B Start
                                  Sub B Stop
                                  Sub B Pool
                                  Sub B FRL
                                  SubB Absorb
                                  Sub B Digit
                                  SpeclNumber   —  ARS FRL
                                                   ARS Digits

                                  Dial 0        —  ARS Pool
                                                   ARS FRL
                                                   ARS Digits
```

```
AuxEquip      —  MusicOnHold
                 Ldspkr Pg*
                 Fax                 —  Port*
                 MaintAlarms            Msg Waiting*
                                        Threshold

                 VMS/AA              —  Transfer Rtn
                                        TT Duration
                                        TT Interval

NightSrvce    —  GroupAssign
                 OutRestrict
                 Emergency
                 ExcludeList*
                 Start
                 Stop
                 Day of Week

Labeling      —  Directory           —  System
                 LinesTrunks            Extension
                 PostMessage            Personal
                 Grp Calling

Data          —  Voice/Data

Print         —  All
                 SysSet-up
                 Dial Plan
                 Labels
                 Trunk Info
                 T1 Info
                 PRI Info
                 RmoteAccess
                 Oper Info
                 AllowList
                 AllowListTo
                 DisallowLst
                 DisallowTo
                 ARS
                 Ext Direct
                 PblicDirect
                 Group Page
                 Ext Info
                 GrpCoverage         —  Delay
                 Grp Calling
                 NightServce
                 Call Pickup

Cntr-Prg
```

* The Inspect feature can be used with this menu option. Press **Inspct** or **PgDn.**

Unit Load Calculation Work Sheet

H

The following worksheet provides the steps for calculating unit load totals for each carrier in the control unit.

1. Number of modules in carrier (excluding power supply module and processor module)

   ■ If fewer than 5, auxiliary power is not required.

   ■ If 5 or 6, continue to step 2.

2. Key or Behind Switch mode only
   Indicate configuration of lines; then go to step 5

   ❏ Square
   ❏ Modified

3. Hybrid/PBX mode only:
   Do all modules in the carrier have MLX and/or analog multiline station jacks?

   ❏ Yes
   ❏ No

   ■ If no, auxiliary power is not required.

   ■ If yes, continue to step 4.

4. Hybrid/PBX mode only:
   Calculate the total number of MLX and analog multiline telephones:

   Number of MLX-20L telephones connected to modules in the carrier

   Number of MLX28D telephones connected to modules in the carrier

   Number of 34-button analog multiline telephones connected to modules in the carrier

   Total of MLX-20L, MLX-28D, and 34-button analog multiline telephones

   ■ If total is less than 45, auxiliary power is not required.

   ■ If total is 45 or more, continue to step 5.

5. Calculate the estimated unit loads:

Module	Qty	x Unit Load = Total	
008		12.0	
008 MLX		13.5	
008 OPT		8.0	
012		8.4	
100D		0.0	
400 GS/LS/TTR		0.0	
400 EM		8.0	
4 0 8		12.0	
408 GS/LS		12.0	
800 GS/LS		0.0	
800DID		8.0	
CPU/MEM		0.0	
Total Estimated Unit Load			

■ If total is less than 54, auxiliary power is not required.

■ If total is 54 or more, continue to step 6.

6. Calculate the actual carrier unit load:

Equipment	Qty x	Unit Load		= Total
		Hybrid PBX or Modified Key	Square Key	
Network Access Lines"				
DID		1.0	1.0	
DS1		0.0	0.0	
GS/LS		0.0	0.0	
Tie		1.4	1.4	
Telephone				
MLX-10		.9	12	
MLX-10D		.9	12	
MLX-28D		1.2	1.7	
MLX-20L		1.1	1.6	
BIS-10		0.9	1.1	
BIB-22		1.0	1.3	
BIS-22D		1.0	1.3	
BIS-34		1.1	1.5	
BIS-34D		1.1	1.5	
MLC-5		0.0	0.0	
10-Button Basic		0.9	1.1	
10-Button HFAI		1.0	1.2	
34-Button Basic		0.9	1.1	
34-Button DLX		12	1.7	
34-Button BIS		12	1.4	
34-Button BIS/DIS		1.2	1.4	
Single-tine Telephone		0.6	0.7	
Optional Equipment Direct Station Selector‡		0.7	0.9	
General Purpose Adapter		0.8	1.0	
Hands-Free Unit		0.8	1.0	
Headset Adapter		0.8	1.0	
	Total Actual Unit Load			

■ If the total actual unit load is less than or equal to 54, auxiliary power is not required.

■ If the total actual unit load is more than 54, continue to step 7.

• Unit loads are computed per trunk for trunk-type network access lines.

† The MFM has its own individual wall power unit located at the station and therefore is not added in the unit load calculation.

‡ Up to two DSSs (one DSSs per MLX-28D or MLX-20L) can be powered from each control unit carrier. For example, a three-carrier system can have six system operator positions, each with one DSS powered from the control unit.

7. Try to exchange modules between carriers to reduce the unit loads to 54. (Remember that the 100D, 400, 400 GS/LS, 800, and 800 GS/LS modules have unit loads of 0.0) Repeat steps 1-6 to recalculate unit loads for the new configuration.

Note: Empty slots are not permitted between modules.

■ If the exchange reduces the unit load to 54 or less, auxiliary power is not required.

■ If the exchange does not reduce the unit load to 54, auxiliary power is required. Continue to step 8.

8. Calculate the unit load for slots 5 and 6 of the carrier.

Equipment	Qty	x Unit Load		Total
		Modified	**Square**	
Network Access Lines•				
DS1		0.0	0.0	
GS/LS		0.0	0.0	
Tie		1.4	1.4	
Telephone				
MLX-10		.9	1.2	
MLX-10D		.9	1.2	
MLX-28D		12	1.7	
MLX-20L		1.1	1.6	
BIS-10		0.9	1.1	
BIS-22		1.0	1.3	
BIS-22D		1.0	1.3	
BIS-34		1.0	1.3	
BIS-34D		1.1	1.5	
MLC-5		1.1	1.5	
10-Button Basic		0.0	0.0	
10-Button HFAI		1.0	1.2	
34—Button Basic		0.9	1.1	
34-Button DLX		1.2	1.7	
W-Button BIS		1.2	1.4	
34-Button BIS/DIS		1..2	1.4	
Single-Line Telephone		0.6	0.7	
Optional Equipment				
Direct station Selector‡		0.7	0.9	
General Purpose Adapter		0.8	1.0	
Hands-Free Unit		0.8	1.0	
Headset Adapter		0.8	1.0	
Total Unit Load for Slots 5 and 6				

■ If the unit load for slots 5 and 6 is less than or equal to 27, auxiliary power is sufficient for the carrier.

■ If the unit load for slots 5 and 6 is more than 27, continue to step 9.

• Unit loads are computer per trunk for trunk-type network access lines.

† The MFM has its own individual wall power unit located at the station and therefore is not added in the unit load calculation.

‡ Up to two DSSs (one DSS per MLX-28D or MLX-20L) can be powered from each control unit carrier. For example, a three-carrier system can have six system operator positions, each with one DSS powered from the control unit.

9. Try to exchange modules between carriers to reduce the unit loads for slots 5 and 6 to 27. (Remember that the 100D, 400,400 GS/LS, 800, and 800 GS/LS modules have unit loads of 0.0.) Repeat steps 1-8 to recalculate unit loads for new configuration.

   Note: Empty slots are not permitted between modules.

   ■ If the exchange reduces the unit load for slots 5 and 6 to 27 or less, auxiliary power is sufficient.

   ■ If the exchange does not reduce the unit load for slots 5 and 6 to 27, install wall power units for the appropriate number of telephones to reduce the unit load to 27.

Abbreviations Glossary

A	ampere
AC	alternating current
ACD	automatic call distribution
ACW	After Call Work (CMS)
AMI	alternate mark inversion
amps	amperes
ANI	automatic number identification
ARS	Automatic Route Selection
ASCAP	American Society of Composers, Artists, and Producers
ASI	alternate space inversion
ASN	AT&T Switched Network Services
AUDIX	Audio Information Exchange
AVP	AUDIX Voice Power
B8ZS	bipolar 8 zero substitution
BIS	Built-in Speakerphone
BMI	Broadcast Music Incorporated
bps	bits per second
BRI	Basic Rate Interface
BTMI	basic telephone modem interface
BTU	British thermal unit
CAS	Call Accounting System for the MERLIN LEGEND™ Communications System
CAS-B	Call Accounting System — Business
CASH	Call Accounting System — Hospitality
CAT	Call Accounting Terminal
CAT-B	Call Accounting Terminal/Business
CAT-H	Call Accounting Terminal/Hospitality
CCITT	Comitee Consultatif Internationale Telephonique et Telegraphique
CCS	common channel signaling
CIB	customer information bulletin
CMS	Call Management System
ComCode	component code
CRC	cyclic redundancy check
CSC	Customer Service Center
CSU	channel service unit
dB	decibel
DC	direct current
DCE	data communications equipment
DCP	Digital Communications Protocol
DFT	direct facility termination
DHG	data hunt group
DID	direct inward dialing
DIP	dual in-line package
DISA	Direct Inward System Access
DLC	direct-line console
DNIS	Dialed Number Identification Service
DOS	Disk Operating System
DSO	Digital Signal 0
DS1	Digital Signal 1
DSE	digital-switch element
DSS	direct station selector

DTE	data terminal equipment
DTMF	dual-tone multifrequency
DXS	direct extension selector
E&M	ear and mouth (receive and transmit)
EIA	Electronic Industries Association
EMI	electromagnetic interference
EPROM	erasable and programmable read-only memory
ES	Extension Status
ESD	electrostatic discharge
ESF	extended superframe format
ESS	electronic switching system
ETN	electronic tandem network
ETU	emergency transfer unit
F	Farenheight
FACE	Forced Account Code Entry
FCC	Federal Communications Commission
FRL	Facility Restriction Level
FX	foreign exchange
GPA	General Purpose Adapter
GS	ground-start
HFAI	Hands Free Answer on Intercom
HFU	hands-free unit
Hz	hertz
ICOM	Intercom
I/O	input/output
IROB	in-range out-of-building
ISII	Integrated Solution II
ISDN	Integrated Services Digital Network
IVP	Integrated Voice Power
kbps	kilobits per second
KF	FCC Classification
LAN	local area network
LDN	listed directory number
LED	light-emitting diode
LS	loop-start
Mbps	megabits per second
MET	multibutton electronic telephone
MFM	Multi-Function Module
MIS	management information system
MLT	analog multiline telephone
MOH	Music-on-Hold
ms	millisecond
NSAC	National Service Assistance Center
OPT	off-premises telephone
OPX	off-premises extension
PAM	pulse amplitude modulation
PBX	private branch exchange
PC	personal computer
PCM	pulse code modulation
PEC	price element code
PFT	power failure transfer telephone
PRI	Primary Rate Interface
PSTN	public switched telephone network
QCC	queued call console
RAM	random access memory
RBS	robbed-bit signaling
ROM	read-only memory
SA	System Access
SAA	Supplemental Alert Adapter
SDN	Software Defined Network

SMDR	Station Message Detail Recording
SPC	system programming console
SPM	System Programming and Maintenance
SSN	Switched Services Network
TDM	time-division multiplexing
TEI	terminal equipment identifier
T/R	tip and ring
TSI	time-slot interchanger
TTR	touch-tone receiver
UDM	universal data module
UPAM	Universal Paging Access Module
UPS	uninterruptible power supply
V A	volt-ampere
VAC	volts AC
VAN	value-added network
VAU	voice announcement unit
VMI	voice messaging interface
V.T.	voice terminal
w	watts
WATS	wide area telecommunications service
ZCS	zero code suppression

Glossary

A

access line
A connection from the customer to the local telephone company that provides access to the public network. Also called local loop.

account code
A code used to associate incoming and outgoing calls with corresponding accounts, employees, projects, and clients.

Accunet
AT&T's switched digital service for 56-kbps, 64-kbps restricted, and 64-kbps clear circuit-switched data calls.

address
A coded representation of the destination of data or of the data's originating terminal, such as the dialed extension number assigned to the data terminal. Multiple terminals on one communications line, for example, must each have a unique address.

adjunct
Optional equipment used with the communications system such as an alerting device that connects to a multiline telephone or to a station jack.

administration port reassignment
Reassignment of the system programming position to any of the first five station jacks on the first 008 MLX module in the communications system control unit.

alternate mark inversion (AMI)
A line coding format in which a binary 1 is represented by a positive or negative pulse, a binary 0 is represented by no line signal, and subsequent binary 1's must alternate in polarity or there will be a bipolar violation. AMI is used in the DS1 interface.

analog transmission
A mode of transmission in which information is represented in continuously variable physical quantities such as amplitude, frequency, phase, or resistance. See also *digital transmission.*

application
Software and/or hardware that allows users to perform specific tasks. For example, the Call Management System (CMS) is a DOS-based application that simulates the actions of a system operator by answering calls and distributing them to individual telephones.

asynchronous data transmission
A method of transmitting a short bit stream of data such as printable characters represented by a 7- or 8-bit ASCII code. Each string of data bits is preceded by a start bit and followed by a stop bit, thus permitting data to be transmitted at irregular intervals. See also *synchronous transmission.*

AT&T Switched Network (ASN)
AT&T telecommunications services provided through an integrated Digital Services Network Primary Rate Interface (ISDN-PRI) line or trunk Accunet® switched digital service, Megacom® WATS, Megacom 800, Software Defined Network (SDN), MultiQUEST, and Shared Access for Switch Services (SASS).

Audix Voice Power (AVP)
A voice-processing application, part of Integrated Solution II, that provides automated attendant, call answering, voice-mail, message drop, and information services for use with the communications system.

automatic number identification (ANI)
The process of automatically identifying a caller's billing number and transmitting that number from the caller's local central office (CO) to another point on or off the public network. INFO-2 (INformation FOrwarding-2) is AT&T's ANI service.

automatic-ringdown tie trunk
See *automatic-start tie trunk.*

automatic-start tie trunk
> A tie trunk on which incoming calls are routed to an operator or other designated destination without a start signal. Also called automatic-ringdown tie trunk or auto-in tie trunk.

auxiliary power unit
> A device that provides additional power to the communications system.

B

B channel
> For an Integrated Services Digital Network (ISDN), a 64-kbps channel that carries a variety of digital information streams. such as voice at 64-kbps, data at up to 64 kpbs, wideband voice encoded at 64 kpbs, and voice at less than 64 kbps, alone or combined with other digital information streams. Also called bearer channel

bandwidth
> The difference, expressed in hertz, between the highest and lowest frequencies in a range of frequencies that determine channel capacity.

barrier code
> A password used to limit access to the Remote Access feature of the communication system.

basic carrier
> A piece of hardware that holds and connects the processor module; power supply module; and up to five line, trunk or station modules in the communications system. See also *expansion carrier.*

Basic Rate Interface (BRI)
> A standard Integrated Services Digital Network (ISDN) frame format that specifies the protocol used between the communications system and a terminal. BRI runs at 192 kbps and provides two 64-kbps voice or B channels and one 16-kbps signaling or D channel per port. The remaining 48 kbps are used for framing and D-channel contention.

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.*

Behind Switch
> A mode of operation in which the communications system control unit is connected to (is "behind') another communication system.

binary code
> An electrical representation of quantities or symbols expressed in the base-2 number system.

bipolar 8 zero substitution (B8ZS)
> A line-coding format that encodes a string of 8 zeros in a unique binary sequence using bipolar violation. See also *bipolar signal* and *bipolar violation.*

bipolar signal
> A digital signal in which pulses (1 's) alternate between positive and negative. See also *alternate mark inversion, alternate space inversion, bipolar* 8 *zero substitution,* and *bipolar violation.*

bipolar violation
> A condition that occurs when two positive or two negative pulses are received in succession. See also *alternate mark inversion, alternate space inversion, B8 zero substitution,* and *bipolar* signal.

bit (binary digit)
> One unit of information in binary notation, having two possible values: zero or one.

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.

bits per second (bps)
　The number of binary units of information that are transmitted or received per second. See also *baud* and *bit rate.*

blocking
　A condition in which end-to-end connections cannot be made on calls because of a full load on all possible services and facilities.

broadband
　A transmission path having a bandwidth greater than a voice-grade channel.

bus
　A multiconductor electrical path used to transfer information over a common connection from any of several sources to any of several destinations.

button
　A key on the face of a telephone or console that is used to access a line, activate a feature, or enter a code on a communications system.

byte
　A sequence of bits (usually eight) processed together. "Octet" is used instead of "byte" in CCITT (International Telegraph and Telephone Consultative Committee) documentation.

C

Call Accounting System (CAS)
　A vendor-supplied DOS or UNIX-based application that monitors and manages telecommunications costs.

Call Accounting Terminal (CAS)
　A vendor-supplied stand-alone unit with a built-in microprocessor and data buffer that provides simple call accounting at a low cost.

Callback queue
　The queue used to hold Callback callers who have requested a busy pool or extension.

calling group
　A team of agents who answer the same types of calls.

Call Management System (CMS)
　A DOS-based application that simulates the actions of a system operator by answering and distributing calls. CMS also produces management reports for call analysis.

campus cable
　Cable that runs between buildings connected to the same communications system.

central office (CO)
　The location of telephone switching equipment that provides local telephone service and access to toll facilities for long-distance calling.

central processor
　The part of a computer that interprets and executes instructions. Also called central processing unit.

Centrex
　A set of communications system features a user can subscribe to on telephone lines from the local telephone company.

Channel
A telecommunications transmission path for voice and/or data.

channel service unit (CSU)
Equipment used at a customer's premises to provide DS1 facility terminations and signaling compatibility.

checksum
The sum of ones in a sequence of ones and zeros to detect or correct errors in data transmission.

circuit-switched data call
A data call made via a connection exclusively established and maintained between data stations for the duration of the data call.

clock synchroniztion
The operation of digital facilities from a common clock.

coaxial cable
A cable consisting of one conductor, usually a small copper tube or wire, within and insulated from another conductor of large diameter, usually copper tubing or copper braid.

codec (Coder-decoder)
A device used to convert analog signals such as speech, music, or television to digital form for transmission over a digital medium and back to the original analog form.

CO line/trunk jack
A jack that connects an outside line/trunk to the communications system control unit.

common-channel signaling (CCS)
Signaling in which one channel of a group of channels carries signaling information for each of the remaining channels, permitting each of the remaining channels to be used to nearly full capacity. In the system's DS1 module, channel 24 can be designated as the signaling channel for channels 1-23 by selecting "common channel" for emulated service when programming the system. CCS must be used for ISDN-PRI service.

communications system
The software-controlled processor complex that interprets dialing pulses, tones, and/or keyboard characters and makes the proper interconnections both inside and outside the system. The communications system itself consists of a digital computer, software, a 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.

companding
The compression or expansion of the quantizing scale to reduce distortion. See also quantizing.

control unit
The housing, carriers, power supply module, processor module, and line/trunk and station modules of a communications system.

conversion resource
See *modem pool.*

cyclic redundancy check (CRC)
An error-detection code used on DS1 facilities with the extended superframe framing (ESF) format.

D

D channel
The 16-kbps or 64-kbps channel carrying signaling or data on an Integrated Services Digital Network Basic Rate Interface (ISDN-BRI) or 64-kbps channel carrying signaling or data on an ISDN Primary Rate Interface (ISDN-PRI).

D4 framing format
A framing format consisting of a sequence of individual frames of 24 eight-bit slots and 1 signal bit (193 bits) in a 12-frame superframe. See also *extended superfame format.*

data communications equipment (DCE)
Equipment such as modems or data modules used to establish, maintain, and terminate *a* connection between the communications system and data terminal equipment (DTE), such as printers, host computers, or workstations.

data hunt group (DHG)
A group of analog or digital data stations that share a common access code. Calls are connected in a round-robin fashion to the first available data station in the group.

data rate
See *bit rate.*

data terminal
An input/output (I/O) device that can be connected to the communications system control unit via an interface.

data terminal equipment (DTE)
The equipment that makes up the endpoints in a connection over a data circuit — for example. a data terminal, host computer, or printer.

dedicated feature buttons
The imprinted feature buttons on a telephone: Conf or Conference, Drop. HFAI (Hands Free Answer on Intercom), Hold, Mute or Microphone, Speaker or Speakerphone, Transfer, Message, and Recall.

delay-dial-start tie trunk
A type of tie trunk on which the originating end of the tie trunk transmits an off-hook signal to the receiving end and waits for the receiving end to send an off-hook signal followed by an on-hook signal. Also called a dial-repeating tie trunk.

dial access
See *feature code.*

Dialed,Number Identification Service (DNIS)
A service provided by the AT&T Switched Network that routes incoming 800 or 900 calls according to customer-selected parameters, such as area code, state, or time of call.

dial-out code
A code (usually a 9) dialed by single-line telephone users and multiline telephone users with System Access (SA) buttons to get an outside line.

DID (direct inward dialing) trunk
An incoming trunk that receives dialed digits from the local exchange, allowing the communications system to connect directly to a station without assistance from the system operator.

digital
The representation of information in discrete elements such as off and on or 0 and 1. See also *analog transmission.*

Digital communications Protocol (DCP)
An AT&T proprietary protocol to transmit both digitized voice and data over the same communications link. A DCP link is made up of two 64-kbps reformation (I) channels and one signaling (S) channel similar to the B and D channels used in an integrated Services Digital Network (ISDN).

digital switch element (DSE)
A device in each jack on each module in the communications system control unit that interfaces with the TDM (time-division multiplex) bus.

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. See also *analog transmission.*

DIP (dual in-line package) switch
A switch on a 400EM module used to select the signaling format for tie-line transmission. DIP switches are also used on other equipment for setting hardware options.

direct facility termination (DFT)
A central office (CO) line/trunk that terminates directly on one or more telephones; in PBX mode a DFT cannot be part of a trunk pool.

direct inward dialing (DID)
A Service that transmits the called station number to the communications system from the central office (CO) and routes incoming calls directly to the called station, calling group, or outgoing trunk pool, bypassing the system operator.

Direct Station Selector (DSS)
A 60-button adjunct that enhances the call-handling capabilities of an MLX-20L telephone or MLX-28D telephone when used as an operator console.

display buttons
The buttons on an MLX display telephone used to access the telephone's display.

door answering unit
A device that is connected to a basic telephone jack and used at an unattended station or front desk.

DSO (Digital Signal 0)
A single 84-kbps voice or data channel.

DS1 (Digital Signal 1)
A bit-oriented signaling (BOS) interface that multiplexes 24 64-kbps channels into a single 1.544-Mbps stream.

dual-tone multifrequency (DTMF) signaling
Touch-tone signaling from telephones using the voice transmission path. The code for DTMF signaling provides 12 distinct signals, each composed of two voice-band frequencies.

E

E and M signaling
Trunk supervisory signaling, used between two communications systems, in which signaling information is transferred through two-state voltage conditions (on the E and M leads) for analog applications and through two bits for digital applications. Used in tie trunks.

EIA (Electronic Industries Association)
A trade association of the electronics industry that establishes electrical and functional standards.

electronic switching system (ESS)
A class of modem switching central office (CO) systems developed by AT&T in which the control functions are performed principally by electronic data processors operating under the direction of a stored program.

endpoint
The final destination in the path of an electrical or telecommunications signal.

expansion carrier
A carrier added to the control unit when the basic carrier cannot house all the modules needed. An expansion carrier houses a power supply module and up to six additional line/trunk and station modules.

extended superframe format (ESF)
A framing format consisting of individual frames of 24 eight-bit slots and 1 signal bit (193 bits) in a 24-frame extended superframe. See also *D4 framing format.*

F

facility
The equipment constituting a telecommunications path between the communications system and the central office (CO).

factory setting
The default state of a device or feature if the user does not choose an optional setting.

fax (facsimile)
A process or the result of a process in which graphic material is scanned and the information converted into electrical signal waves to produce an exact likeness.

feature
A function or service provided by a hardware or software product.

feature code
A code entered on a dialpad to activate a feature. For example, a user might press the feature button or might dial #33.

Feature screen
A display screen on digital/ISDN display telephones that provides quick access to commonly used features.

foil shield
A copper foil sheet for power units on expansion carriers that is used to prevent excessive noise on the module immediately to the right of the power supply module in each expansion carrier.

frame
One of several segments of an analog or digital signal that has a repetitive characteristic. For example, a DS1 frame consists of a framing bit and 24 octets, which equals 193 bits.

frequency generator
A circuit pack added to the power unit module that generates a high-voltage, 20-30-Hz signal to ring a telephone. Also called a ring generator.

FX (foreign exchange)
A central office (CO) other than the one providing local access to the public network.

G

General Purpose Adapter (GPA)
A device that connects an analog multiline telephone to optional equipment such as an answering machine or a fax machine.

glare
The loud dual-tone multi-frequency (DTMF) signal an incoming caller hears when another caller tries to call out on a line/trunk at the same time the call is coming in on that line/trunk.

ground-start (GS) line/trunk
A line/trunk on which, after verifying that the line/trunk is idle (no ground on tip), the communications System transmits a request for service (puts ground on ring) to a distant central office (CO).

H

headset
An ultralight earpiece and microphone for hands-free telephone operation.

Home screen
The "home base" of the display screen on digital/ISDN telephones, which shows time, date, and call information, and when a feature is in use.

house cable
Cable that runs from the equipment room to a small, walk-in closet (called a satellite closet) elsewhere in the building.

Hybrid/PBX
A mode of operation in which the communications system uses trunk pools and Automatic Route Selection (ARS) in addition to personal lines-that is, direct facility terminations (DFTs) on line buttons. The Hybrid/PBX mode also provides a single interface to users for both internal and external calling.

I

immediate-start tie trunk
A tie trunk on which no start signal is necessary and dialing can begin immediately after the tie trunk is seized.

in-band signaling
See robbed-bit signaling.

inside dial tone
A tone the user hears when they are connected to an intercom line.

Inspect Screen
A display screen on digital/ISDN telephones that allows users to preview incoming calls and see a list of the features programmed on line buttons.

integrated access
The use by customers of voice, data, images, and fax simultaneously on an integrated Services Digital Network (ISDN).

Integrated Services Digital Network (ISDN)
A public or private network that provides end-to-end digital connectivity for all services to which users have access by a limited set of standard multipurpose user-network interfaces defined by the CCITT (International Telegraph and Telephone Consultative Committee). Through internationally accepted standard interfaces, ISDN provides digital circuit-switched or packet-switched connectivity within the network and links to other ISDNs to provide national and international digital connectivity.

Integrated Solution II (IS II)
One or more UNIX-based applications for improving voice and data communications and automating office operations.

Integrated Voice Power Automated Attendant
An IS II application that automatically answers incoming calls with a recorded announcement and directs callers to a department, an extension, or the system operator.

interface
Hardware, software, or both that links systems, programs, or devices.

I/O (input/output) device
Equipment that can be attached to a computer internally or externally for managing a computer system's input and output of information.

IROB (in-range out-f-building) protector
A surge protection device for off-premises telephones at a location within 1000 feet of cable distance from the communications system control unit.

ISDN 7500B Data Module
A data communications device that allows connection between RS-232 data terminal equipment (DTE) and the communications system control unit via MLX station jacks on the 008 MLX module. The ISDN 7500B Data Module is used together with a modem in a modem pool to change digital data signals to analog signals. and vice versa, which allows transmission between digital and analog data stations.

J

jack
A device, accessed by inserting a plug, that is used to terminate the permanent wiring of a circuit.

K

Key
A mode of operation in which the communications system uses direct facility terminations (DFTs) on line buttons with a separate path for internal calling.

L

LED (light-emitting diode)
A semiconductor device that produces light when voltage is applied. LEDs show the operational status of hardware components, the results of maintenance tests, the alarm status of circuit packs, and the activation of telephone features.

line and trunk assignment
The assignment of lines and trunks connected to the communications system control unit to specific buttons on each telephone.

line coding
The pattern data assumes as it is transmitted over a communications channel.

line compensation
An adjustment for the amount of cable loss in decibels (dBs), based on the length of cable between a DS1 module and a channel service unit (CSU) or other far-end connection point.

line/trunk and station module
A module on which the jacks for connecting central office (CO) lines/trunks and/or the jacks for connecting the stations are located.

local area network (LAN)
A networking arrangement designed for a limited geographical area.

local host computer access
A method for connecting a station jack to an on-site computer for data-only calls through a modem or data module.

logical ID
A numbering sequence used to identify station and line/trunk locations on the communications system control unit.

loop-start (LS) line/trunk
A line/trunk on which a closure between the tip and ring leads is used to originate or answer a call High-voltage 20-Hz AC ringing from the central office (CO) signals an incoming call.

M

Magic on Hold®
A customized Music-on-Hold (MOH) system enhancement that promotes the customer's products and services.

Megacom
AT&T's tariffed digital WATS (wide area telecommunications service} offering for outward calling.

Megacom 800
AT&T's tariffed digital 800 service for inward calling.

MERLIN LEGEND Attendant
An application with equipment that connects to one or more tip/ring station ports and automatically answers incoming calls with a recorded announcement. In response to touch-tone digits dialed by the caller, MERLIN LEGEND Attendant directs the caller to a department, an extension, or the system operator.

MERLIN MAIL® Voice Messaging System
An application that provides automated attendant, call answering, and Voice-mail services on the communications system.

MLX-10/MLX-10D telephone
A 10-button telephone offered with or without a 2-line by 24 character, menu-driven display.

MLX-20L telephone
A telephone with 20 programmable line or feature buttons and a 7-line by 24-character, menu-driven display.

MLX-28D telephone
A telephone with 28 programmable line or feature buttons and a 2-line by 24-character, menu-driven display.

modem
A device that converts digital data signals to analog signals for transmission over telephone lines. The analog signals are converted back to the original digital data signals by another modem at the other end of the line.

modem pool
A pair, or group of pairs, of modems and data modules with interconnected RS-232 interfaces that converts digital signals to analog, or analog signals to digital, thereby allowing users with Integrated Digital Services Network (ISDN) digital data stations to communicate with users who have analog stations.

Multi-Function Module (MFM)
An adapter that provides a tip/ring interface for the connection of optional equipment such as answering machines, external alerts, and fax machines to a digital/ISDN (MLX) telephone. The optional equipment and the MLX telephone operate simultaneously and independently. The MFM is installed inside the MLX telephone.

multiplexing
A process in which a transmission channel is divided into two or more channels, either by splitting the frequency band into a number of narrower bands or by dividing the channel into successive time slots.

Music-on-Hold (MOH)
Magic on Hold or a customer-provided music source connected to the communications system via a loop-start (LS) jack. Most MOH equipment is designed for LS operation.
Note: If you use equipment that rebroadcasts music or other copyrighted materials, you may be required to obtain a copyright license from and pay fees to a third party such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or you can purchase a Magic on Hold system, which does not require such a license, from AT&T or your authorized AT&T dealer.

N

network
> A configuration of communications devices and software connected for information interchange.

network interface
> Hardware, software, or both that links two systems in an interconnected group of systems, for example, between the local telephone company and a PBX.

O

off-premises telephone
> A telephone located in a building other than where the control unit is located.

ones density
> The requirement for channelized DSI service to the public network that eight consecutive zeros cannot be in a digital data stream.

outcalling
> A feature of the MERLIN MAIL Voice Messaging System application. When outcalling is activated, the user is automatically called by the system at a programmed number when a new message is received in his or her mailbox.

Out-of-band Signaling
> Signaling that uses the same path as voice-frequency transmission and in which the signaling is outside the band used for voice frequencies.

P

parity
> The addition of a bit to a bit string so that the total number of 1's is odd or even. Parity can be used to detect and correct transmission errors.

pass through
> A connection from an internal modem to a programming port on the communications system.

personal line
> A central office (CO) line that rings only at the use's telephone.

pool
> On a Hybrid/PBX system, a grouping of outside trunks that users can choose with multiple pool buttons or by dialing access codes on an SA (System Access) button on the telephone. Pools are also used by the Automatic Route Selection (ARS) feature to choose the cheapest method to route a call.

port
> A point of access into a communications system, computer, network, or other electronic device.

power supply module
> A device that directs electricity to modules and telephones on the communications system. One power supply module is needed for each carrier, and an auxiliary power unit is added if the module exceeds capacity.

Primary Rate Interface (PRI)
A standard Integrated Services Digital Network (ISDN) access interface that specifies the protocol used between two or more communications systems. PRI runs at 1.544 Mbps and, as used in North America, provides twenty-three 64-kbps B channels (voice or data) and one 64-kbps D channel (signaling). The D channel is the 24th channel of the interface and contains multiplexed signaling information for the other 23 channels.

prime line
An individual extension number assigned to a telephone in a Behind Switch system. Each telephone user has his or her own prime line and is automatically connected to that line when he or she lifts the handset.

processor module
The module in the second slot of the basic carrier that contains the software that runs the communications system.

protocol
A set of conventions governing the format and timing of message exchanges between devices, such as a multiline analog telephone and the communications system control unit.

public network
A network that is commonly accessible for local or long-distance calling. Also called public switched telephone network (PSTN) .

pulse amplitude modulation (PAM)
A modulation technique in which an analog signal, such as speech, modulates a carrier signal consisting of a series of precisely timed pulses of equal amplitude. See also *pulse code modulation.*

pulse code modulation (PCM)
An extension of pulse amplitude modulation (PAM) in which each PAM pulse is quantized and encoded into a 8-bit code to represent the amplitude of each PAM pulse. See also *pulse amplitude modulation.*

Q

quantizing
The process of converting a pulse amplitude modulation (PAM) sample into a discrete number of amplitude values.

R

RAM Random access memory)
Computer memory in which an individual byte or range of bytes can be addressed and read or changed without affecting other parts of the memory.

riser cable
Cable that runs between floors in a multistory building and connects wire closets.

robbed-bit signalling (RBS)
Signaling in which the least significant bit (LSB) of every sixth frame per channel is used for signaling in that channel.

ROM (read-only memory)
Computer memory that can be read but cannot be changed.

RS-232
A physical interface, specified by the EIA (Electronics Industries Association), that transmits and receives asynchronous data at speeds of up to 19.2 kbps over cable distances of 50 feet.

S

signaling
The sending of control and status information between devices to set up, maintain, or take down a connection.

simplex signaling
The transmission of signals in one direction only across a telecommunications channel.

single-line telephone
An industry-standard, touch-tone or rotary telephone that only handles one line/trunk and is connected to the communications system via a jack on a basic telephone module.

SMDR printer
A printer used for Station Message Detail Recording (SMDR) that is connected to the communications system via an RS-232 jack on the processor module.

Software Defined Network (SDN)
An AT&T private networking service created by specialized software within the public network.

special character
A pause, stop, or end-of-dialing signal in a programmed dialing sequence such as an Auto Dial or Personal Speed Dial number.

square Key
A way of configuring the communication system in Key mode so that all lines appear on all telephones.

station
The endpoint on the station side of the communications system. A station can be a telephone with or without an adjunct or can be a data terminal with a modem (analog) or an ISDN 7500B Data Module (digital) attached.

station jack
An analog, digital, or tip/ring (T/R) interface on the control unit module for connecting telephones and other equipment.

Supplemental Alert Adapter (SAA)
A device that permits alerting equipment to be connected to an analog multiline telephone jack so that people working in noisy or remote areas of a building can be alerted to incoming calls.

switched service network (SSN)
A network consisting of terminals, transmission lines, and at least one exchange on which a user can communicate with any other user at anytime.

switchhook flash
Operation of the telephone switchhook in which the on-hook period is in the range of 250-500 ms.

Synchronous
A method for transmitting a continuous digital data stream in which the transmission of each binary bit is synchronized with a master clock.

System acceptance test
A test of all trunks, telephones, data terminals, and features after installation to ensure they are working correctly.

system date
The date that appears on display telephones and Station Message Detail Recording (SMDR) reports.

System Programming & Maintenance (SPM)
A DOS-or UNIX-based application for programming and maintaining the communications system.

system renumbering
A process used to change the extension numbers assigned to stations, adjuncts, calling groups, paging groups, Call Park zones, and Remote Access.

system time
The time that appears on display telephones and is printed on Station Message Detail Recording (SMDR) reports.

T

T1
A digital transmission carrier path that in North America transmits at the DS1 rate of 1.544 Mbps.

telephone power supply unit
Equipment that provides power to an individual telephone.

tie trunk
A private line directly connecting two communications systems together.

time-division multiplexing (TDM)

A process where the transmission channel is divided.

timer
A built-in timing device in a display telephone.

time-slot interchanger
An element of a time-division switching network that separates and switches time-division multiplexed (TDM) signals.

tip-ring (T/R)
The contacts and associated conductors of a single-line telephone plug or jack

touch-tone gate
An operation used to determine if a call is from a touoh-tone or rotary telephone.

touch-tone receiver (TTR)
A device used to decode touch-tones dialed from single-line telephones or Remote Access telephones.

translation

The information used to identify a particular user with a particular telephone.

U

uninterruptible power supply (UPS)
A device that connects to the communications system to provide 117 VAC to the equipment when the commercial power source fails.

Unit load
A measure of the power load drain of a module, telephone, or adjunct.

V

voice-band channel
A transmission channel, generally the 300-3400-Hz frequency band.

voice-only
A station that is set up for making and receiving voice calls but not data calls.

voice Signal pair
A pair of leads on an analog multiline telephone station used for the Voice Announce to Busy feature.

W

WATS (wide area telecommunications service)
A service that allows calls to certain areas for a flat-rate charge based on expected usage.

wink-start tie trunk
A tie trunk on which the originating end transmits an off-hook signal and waits for the remote end to send back a signal (a wink) that it is ready for transmission.

Z

zero code suppression (ZCS)
A binary coding scheme that ensures a data stream contains at least a minimum number of information bits (1's) for receiver synchronization.

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