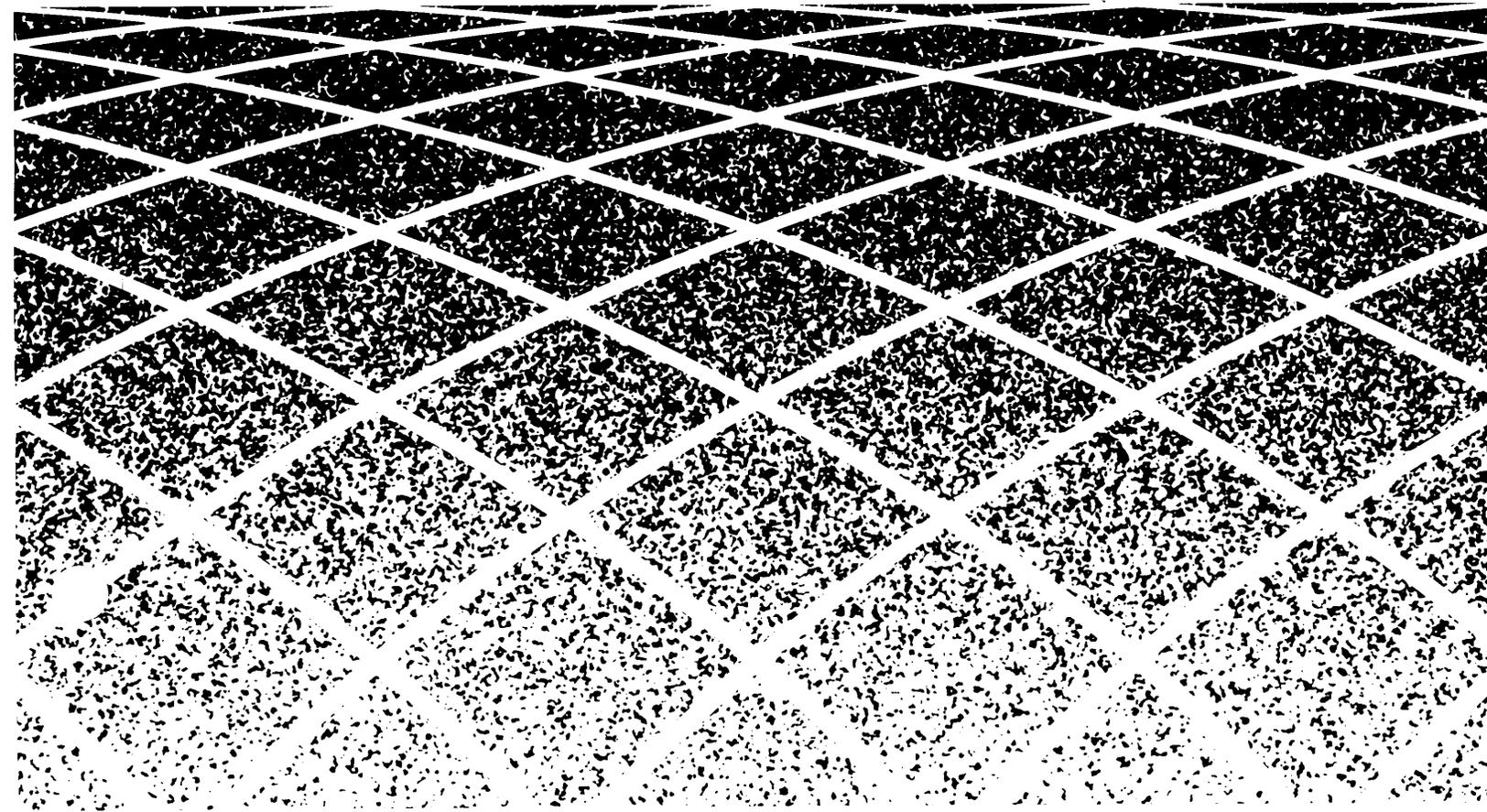




AT&T 555-620-112
Issue 1

MERLIN LEGEND™
Communications System
Release 2.0

System Planning



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Notice

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

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 les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Trademarks

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UNIX is a registered trademark of UNIX System Laboratories, Inc.

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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, always follow basic safety precautions to reduce the risk of fire, electrical 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 a telephone jack 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™ Communications System circuit modules, carrier assemblies, and power units in the MERLIN LEGEND Communications System (511A) control unit.
- Use only AT&T-recommended/approved MERLIN LEGEND Communications System accessories.
- If equipment connected to the analog station modules (008, 408, 408 GS/LS) or to the MLX telephone modules (008 MLX, 408 GS/LS-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 electrical shock.
- The MERLIN LEGEND Communications System is equipped with a three-wire grounding-type plug with a third (grounding) pin. This plug will 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 Communications 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 will 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 electrical shock. Never spill liquid of any kind on this product.
 - Unplug the product from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use cleaners or aerosol cleaners. Auxiliary equipment includes answering machines, alerts, modems, and fax machines. To connect one of these devices, you must first have a **Multi-Function Module (MFM)**.

 **WARNING:**

- *For your personal safety, DO NOT install an MFM yourself.*
- *ONLY an authorized technician or dealer representative shall install, set options, or repair an MFM.*
- *To eliminate the risk of personal injury due to electrical shock, DO NOT attempt to install or remove an MFM from your MLX telephone. Opening or removing the module cover of your telephone may expose you to dangerous voltages.*

SAVE THESE INSTRUCTIONS

Customer Support Information

Support Telephone Number

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

Outside the U. S. A., if you need assistance when installing, programming, or using your system, contact your authorized AT&T dealer.

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 les limites applicables aux appareils numériques de la class A prescrites dans le règlement sur le 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-Mbps digital facilities must be through a USOC RJ48C or RJ48X. Connection to DID requires a USOC 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), which can be found on the back or bottom of the control unit, as follows:
 - If this equipment is to be used as Key System, report the number AS593M-72914-KF-E.
 - If the system provides both manual and automatic selection of incoming/outgoing access to the network, report the number AS593M-72682-MF-E.
 - If there are no directly terminated trunks, or if the only directly terminated facilities are personal lines, report the number AS5USA-65646-PF-E.
 - The REN for all three systems is 1.5A.
 - For tie line connection, the facility interface code (FIC) is TL31M and the service order code (SOC) is 9.0F.
 - For connection to off-premises stations, the FIC is OL13C and the SOC is 9.0F.
 - For equipment to be connected to 1.544-Mbps digital service, the FIC is 04DU9-B for D4 framing format or 04DU9-C for extended framing format, and the SOC is 6.0P.
 - For equipment 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, the sequence in which lines are to be connected: the line types, the FIC, and the 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 number of devices that may be connected to the telephone line. Excessive RENs on the line may result in the devices not ringing in response to an incoming call. In most, but not all, areas the sum of the RENs 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 RENs, contact the telephone company 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 manufacturers, their authorized agents, or others who may be authorized by the FCC. In the event repairs are needed on this equipment, contact your authorized AT&T dealer or, **in the U.S.A. only**, contact the National Service Assistance Center (NSAC) at 1-800-628-2888.

■ **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 advance 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 company 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.
- Perform such activities in off-peak hours, such as early morning or late evening.

■ **Direct Inward Dialing (DID).**

a. This equipment returns answer supervision signals to the Public Switched Telephone Network when:

- (1) answered by the called station
- (2) answered by the attendant
- (3) routed to a recorded announcement that can be administered by the customer premises equipment user
- (4) routed to a dial prompt

b. This equipment returns answer supervision on all DID calls forwarded back to the Public Switched Telephone Network.

Permissible exceptions are when:

- (1) a call is unanswered
- (2) a busy tone is received
- (3) a reorder tone is received

Allowing this equipment to be operated in such a manner as not to provide proper answer supervision signaling is in violation of Part 68 rules.

DOC Notification and Repair Information

NOTICE: The Canadian Department of Communications (DOC) label identifies 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 connect it 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 electrical 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 conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le Ministère n'assure toutefois pas que 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

matériel doit également être installé en suivant une méthode acceptée de raccordement. Dans certains cas, les fils intérieurs de l'entreprise utilisés pour un service individuel à ligne unique peuvent être prolongés au moyen d'un dispositif homologué de raccordement (cordon prolongateur téléphonique interne). L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans 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 désigné 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 particulièrement importante dans les régions rurales.

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

L'indite de charge (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordée à un circuit téléphonique bouclé utilisé par ce dispositif. La terminaison du circuit bouclé peut être constituée de n'importe quelle combinaison de dispositifs, pourvu que 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'indite de charge: 6

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

**Ministère des Communications
du Canada emplacement de
l'étiquette**

MERLIN LEGEND

AT&T

Model 511A Control Unit



LISTED
538E



TELEPHONE
EQUIPMENT

LR 56260

MADE IN U.S.A.

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. See the System Reference Manual for proper FCC Classification.
FCC Reg. Nos. MF: AS593M-72682-MF-E
KF: AS593M-72914-KF-E
PF: AS5USA-65646-PF-E
REN: 1.5A

CANADA

DR ID

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 présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère 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'équipement est utilisé pour des applications extérieures, l'installation d'un protecteur secondaire est requise. Voir le manuel d'installation.

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 else'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 use 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 properly 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 minimize 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

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. 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.

This 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&T will not be responsible under the limited warranty for damages resulting from

- failure to follow AT&T's installation, operation, or maintenance instructions
- unauthorized 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 ABOVE, AT&T, ITS AFFILIATES, SUPPLIERS, AND AUTHORIZED RESELLERS MAKE NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIM ANY WARRANTIES OF MERCHANTABILITY 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 OTHERWISE EXPRESSLY ASSUMED IN A WRITTEN AGREEMENT SIGNED BY AT&T, THE LIABILITY 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.

Voice Mail Systems

Your Voice Mail system permits callers to leave verbal messages for system users or gain access to the back-up position in an emergency as well as create and distribute voice messages among system users.

The Voice Mail system, through proper administration, can help you reduce the risk of unauthorized persons gaining access to the network. However, phone numbers and authorization codes can be compromised when overheard in a public location, are lost through theft of a wallet or purse containing access information, or through carelessness (writing codes on a piece of paper and improperly discarding them). Additionally, hackers may use a computer to dial an access code and then publish the information to other hackers. Substantial charges can accumulate quickly. It is your responsibility to take appropriate steps to implement the features properly, evaluate and administer the various restriction levels, protect and carefully distribute access codes.

Under applicable tariffs, you will be responsible for payment of toll charges. AT&T cannot be responsible for such charges and will not make any allowance or give any credit resulting from unauthorized access.

To reduce the risk of unauthorized access through your Voice Mail system, please observe the following procedures:

- Employees who have voice mailboxes should be required to use the passwords to protect their mailboxes.
 - Have them use random sequence passwords.
 - Impress upon them the importance of keeping their passwords a secret.
 - Encourage them to change their passwords regularly.
- The administrator should remove any unneeded voice mailboxes from the system immediately.

- AUDIX Voice Power™ has the ability to limit transfers to subscribers only. You are strongly urged to limit transfers in this manner.
- Use the PBX or Key system administration capability 10 do the following:
 - Block direct access to outgoing lines and force the use of account codes/authorization codes.
 - Disallow trunk-to-trunk transfer unless required.
 - Assign toll restriction levels to all AUDIX Voice Power ports. If you do not need to use the Outcalling feature, completely restrict the outward calling capability of the AUDIX Voice Power ports.
- Monitor SMDR reports or Call Accounting System reports for outgoing calls that might be originated by AUDIX Voice Power ports.

Remote Administration and Maintenance

The Remote Administration and Maintenance feature of your telecommunications system, if you choose to use it, permits users to change the system features and capabilities from a remote location.

The Remote Administration and Maintenance feature, through proper administration, can help you reduce the risk of unauthorized persons gaining access to the network. However, telephone numbers and authorization codes can be compromised when overheard in a public location are lost through theft of a wallet or purse containing access information, or through carelessness (writing codes on a piece of paper and improperly discarding them) Additionally, hackers may use a computer to dial an access code and then publish the information to other hackers. Substantial charges can accumulate quickly. It is your responsibility to take appropriate steps to implement the features properly, evaluate and administer the various restriction levels, and protect and carefully distribute access codes.

Under applicable tariffs, you will be responsible for payment of toll charges. AT&T cannot be responsible for such charges and will not make any allowance or give any credit resulting from unauthorized access.

To reduce the risk of unauthorized access through Remote Administration and Maintenance, please observe the following procedures:

- The System Administration and Maintenance capability of a PBX or Key system is protected by a password.
 - Change the default password immediately.
 - Continue to change the password regularly.
 - Only give the password to people who need it and Impress upon them the need to keep it secret.
 - If anyone who knows the password leaves the company, change the password immediately.

- If you have a special telephone line connected to your PBX or Key system for Remote Administration and Maintenance, you should do one of the following:
 - Unplug the line when it is not being used.
 - Install a switch in the line to turn it off when it is not being used
 - Keep the Remote Administration and Maintenance telephone number secret. Only give it to people who need to know it, and impress upon them the need to keep it a secret. Do not write the telephone number on the PBX or Key system, the connecting equipment, or anywhere else in the system room.
- If your Remote Administration and Maintenance feature requires that someone in your office transfer the caller to the Remote Administration and Maintenance extension, you should impress upon your employees the importance of only transferring authorized individuals to that extension.

About This Book

When a MERLIN LEGEND™ Communications System, Release 2.0, is installed and set up, it must be programmed to function according to the features and options selected by the customer. To facilitate the programming process, planning forms are used to record all of the parameters that must be set. This book contains instructions on how to fill out these forms.

If the system you are planning for has AUDIX Voice Power™/FAX Attendant System™, the programming of information common to those systems and this communications system can be entered just once by using the Integrated Administration feature. To plan for those common entries, complete the forms in this book in conjunction with the planning forms for AUDIX Voice Power/FAX Attendant System. Instructions for completing the AUDIX Voice Power planning forms are contained in the documentation for that product.

Intended Audience

This book is intended for those persons who work with customers and plan, coordinate, and implement the system. It is assumed that readers are familiar with the system, including hardware components and features.

Product Enhancements

Several enhancements have been implemented for Release 1.1 and Release 2.0 of the system. Enhancements that need to be planned for have been incorporated into the forms and into the procedures in this book for completing the forms. This section briefly describes those enhancements that require planning. Detailed information about these and other enhancements is contained in *Feature Reference* and *Equipment and Operations Reference*.

Release 1.1 Enhancements

Release 1.1 includes all Release 1.0 functionality plus the following enhancements that must be planned for:

- **Language selection—allows** the system to be programmed for prompts, menus, and messages on MLX display telephones to appear in English, French, or Spanish. Each of the following can also be programmed for any of these languages, independently of the system language:
 - Individual extensions with MLX telephones
 - SPM (System Programming and Maintenance)
 - System programming reports
 - SMDR report headers

- **8102 and 8110 analog voice telephones**

Release 2.0 Enhancements

Release 2.0 includes all Release 1.1 functionality plus the following enhancements that must be planned for:

- **Programming Enhancements**
 - **Extension Copy feature** - reduces programming time by allowing the use of any extension as a template for programming another extension or block of extensions through centralized programming
 - **Integrated Administration** - provides a single interface through Integrated Solution III (IS-III) for programming entries common to the system and AUDIX Voice Power/FAX Attendant System.

- **System Operational Enhancements**
 - **Coverage VMS feature** - prevents incoming external calls from going to voice mail. The feature is programmed extension-by-extension, either through extension programming or through centralized programming

- **Calling Group as Night Service Group Assignment** - allows a Night Service group to be programmed to include a Calling Group as a member.

Direct Inward Dialing (DID) trunk emulation on TI facility - provides 24 DID channels on a single DS1 trunk interface, instead of requiring 24 separate physical trunks.

- **408 GS/LS-MLX module** - combines four ports for ground-start or loop-start trunks and eight ports for MLX telephones on a single module in the control unit.
- **Primary Rate Interface (PRI) enhancements** - provide the following:
 - Connectivity to the 5ESS® Generic 6
 - multiple incoming calls to directory number
 - Call-by-Call Service
 - Station ID (SID) as Calling Party Number for Automatic Number ID (ANI)
- **Call type for Automatic Route Selection (ARS) subpatterns** - voice, data, or both

How to Use This Book

This book has been designed to provide optimal assistance to you in completing the planning forms, for example:

1. Since some chapters and/or sections apply only to one or another of the configurations (Key or Behind Switch, Hybrid/PBX, or data communications), these sections are clearly marked, for example, "Hybrid/PBX Mode Only." Also, "guideposts" throughout the book will alert you to proceed or skip chapters or sections that don't apply to one system or another. Proceed through the book as appropriate.
2. A list of the forms or information that will be needed for particular procedures appears at the beginning of each chapter and section.
3. Section titles in the book correspond to headings on forms wherever possible.
4. Where appropriate, examples of completed forms are included so you can confirm what you have done.

Since this book assumes that you are familiar with the system, detailed information about equipment and features is not included. Therefore, it is recommended that you have the *Equipment and Operations Reference* and the *Feature Reference* available as you complete the forms.

About the Planning Forms

The planning forms are separated into two major groups:

- System Forms
- Data Forms

Within each section, the forms are grouped by topic and numbered accordingly, for example, Form 1, Form 2a, 2b, etc. Some forms have multiple sheets. The front and back of each form sheet have a page number. For example, Form 4a is one sheet with a front (Page 1) and a back (Page 2). Page numbers are sometimes referenced in procedures.

These forms are contained in Appendixes A and B of this book. The “T1/PRI Planner” for National Technical Marketing (NTM) review of PRI information is separate from these two major groups and is contained in Appendix C.

The forms are also available as a separate package (including the “T1/PRI Planner”). It is recommended that, if no packages of blank forms are available at your site, you make copies of the forms in Appendixes A and B (and Appendixes C and D if the system has DS1 connectivity), and use the copies, retaining the originals for future use.

Changes have been made to the forms reflecting Release 2.0 enhancements and as a result of feedback from those in the field who use the forms. Some new forms have been added, some forms have been combined (thus allowing the deletion of some forms and the renumbering of the remaining forms), and some information within forms has been corrected for ease of use or to better match the system. In addition, several forms now have information and instructions relating to AUDIX Voice Power/FAX Attendant System.

The most significant changes made to the forms are the following:

- Since the Key and PBX forms have been combined, information specific to systems operating in Hybrid/PBX mode is shaded to alert you to mode differences.
- Form 1, System Planning, includes lines for calculating trunk and station capacity for the new 408 GS/LS—MLX module on page 1. Page 2 includes a section to select a language for the system, SMDR, and report printers, as well as a box for system console information.
- Form 2a, System Numbering—Station Jacks, combines the previous Forms 2a and 2e, Technician’s Run sheet, and now includes a column to note extensions that have AUDIX Voice Power such that Integrated Administration may be used to enter some of their information.

NOTE:

- Since Forms 2a and 2c now include label information formerly recorded on Forms 8b and 8a, respectively, the latter have been deleted from the forms package.
 - Form 2c, System Numbering—Trunk Jacks, now includes pool information previously entered on a separate form (which has been deleted from the package).
 - Form 3b, Incoming Trunks—DSI Connectivity (100D Module), has been redesigned to include T1 trunk information, and new pages to record information about Release 2.0 PRI enhancements.
 - Form 4a, Extension Copy—Analog Multiline Telephone Template, and Form 4c, Extension Copy—MLX Telephone Template, enable you to record information for the new Extension Copy feature.
 - Individual telephone forms (Forms 4b, 4d, 4f, 5a, and 5b, have enlarged button diagrams providing additional space to write button information, for example, personal line number or ringing options. Also, additional items have been added to better reflect the contents of the Extensions Report, as well as for AUDIX Voice Power.
 - Form 6e, Group Calling, now includes an item for "Coverage Group Receiver" under the heading of "Calling Group Options."
 - Form 6i, Call Restriction Assignments and Lists, is new and is designed as a summary sheet and an aid in programming the system.
 - Form 7a, Night Service—Group Assignment, includes Calling Group No. as part of the assignment option for Release 2.0.
 - Form 8b, System Speed Dial, now includes shading on every fourth line as a visual aid.
- Form 9b, Automatic Route Selection Tables, now includes a Call Type (Voice/Data) column for subpatterns.

Instructions for completing the forms have been rewritten to accommodate these changes.

Terms and Conventions Used

In this document, the terms in the following list are used in preference to other, equally acceptable terms for describing communications systems.

- telephone (instead of voice terminal)
- extension (instead of station)
- control unit (instead of switch)

Also, although the terms “line” and “trunk” technically refer to different facilities, the differentiation is not as clear as it once was and the terms are usually treated as if they were interchangeable. Since the industry trend is toward using “trunk” to refer to either facility, this standard is used in this book.

Typographical conventions are used in this book to distinguish certain kinds of information. The conventions are as follows:

- Bold type is used for emphasis:

This feature does **not** apply to tie trunks.

- A special bold type is used for information that you write on the forms:

Write **fax**, **ans. mach.** , or **headset**.

Product Safety Labels

Throughout these documents, hazardous situations are indicated by an exclamation point inside a triangle and 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 could cause minor personal injury or property damage if the hazard is not avoided.

Security

Certain features of the system can be protected by passwords to prevent unauthorized users from abusing the system. It is strongly suggested that you assign passwords wherever you can and that you limit knowledge of such passwords to three or fewer people.

Non-displaying access codes and telephone numbers provide another layer of security. For more information, see the "Customer Support Information" earlier in this book.

Related Documents

In addition to this book, the documents listed below are part of the documentation set. Within the continental United States, these documents can be ordered from the AT&T Customer Information Center by calling 1-800-432-6600.

Document No.	Title
System Documents	
555-620-114	<i>System Overview</i>
555-620-110	<i>Feature Reference</i>
555-620-115	<i>Equipment and Operations Reference</i>
555-620-116	<i>Pocket Reference</i>
555-620-111	<i>System Programming</i>
555-620-112	<i>System Planning</i>
555-620-113	<i>System Planning Forms</i>
Telephone User Support	
555-620-122	<i>MLX-10D, MLX-28D, and MLX-20L Display Telephones User's Guide</i>
555-620-123	<i>MLX-10D, MLX-28D, and MLX-20L Display Telephones Quick Reference</i>
555-620-150	<i>MLX-10D Telephone Tray Cards (6 cards)</i>
555-620-152	<i>MLX-28D and MLX-20L Telephone Tray Cards (5 cards)</i>
555-620-124	<i>MLX-10 Non-Display Telephone User's Guide</i>
555-620-125	<i>MLX-10 Non-Display Telephone Quick Reference</i>
555-620-151	<i>MLX-10 (non-display) Telephone Tray Cards (6 cards)</i>
555-620-120	<i>Analog Multiline Telephones User's Guide</i>
555-620-121	<i>Analog Multiline Telephones Quick Reference</i>
555-620-128	<i>ML C-5 Cordless Telephone Quick Reference</i>
555-620-126	<i>Single-Line Telephones User's Guide</i>
555-620-127	<i>Single-Line Telephones Quick Reference</i>

<u>Document No.</u>	<u>Title</u>
	System Operator Support
555-620-134	<i>MLX Direct-Line Consoles Operator's Guide</i>
555-620-135	<i>MLX Direct-Line Consoles Quick Reference</i>
555-620-132	<i>Analog Direct-Line Consoles Operator's Guide</i>
555-620-133	<i>Analog Direct-Line Consoles Quick Reference</i>
555-620-136	<i>MLX Queued Call Console Operator's Guide</i>
555-620-137	<i>MLX Queued Call Console Quick Reference</i>
	Miscellaneous User Support
555-620-130	<i>Calling Group Supervisor's Guide</i>
555-620-131	<i>Calling Group Supervisor's Quick Reference</i>
555-620-129	<i>Data User's Guide</i>
	Documentation for Qualified Technicians
555-620-140	<i>Installation, Programming, & Maintenance (IP&M) Binder</i> (consists of 555-620-141, 555-620-142, 555-620-143, and 555-620-144)
555-620-141	<i>Installation</i>
555-620-142	<i>System Programming & Maintenance (SPM)</i>
555-620-143	<i>Maintenance and Troubleshooting</i>
555-620-144	<i>Programming Summary</i>

How to Comment on This Document

We welcome your comments, both good and bad. Please use the feedback form on the next page to let us know how we can continue to serve you. If the feedback form is missing, write directly to:

A. Sherwood
AT&T
99 Jefferson Road
Room 2A25
Parsippany, NJ 07054.

Several tasks should be performed before you begin filling out the planning forms for the system:

1. Review the system's hardware, features, and operation as defined at time of purchase.
2. Obtain required information from the local telephone company
3. Confirm the location of the control unit.
4. Obtain information about telephone users and their needs.
5. Obtain or develop a floor plan of the customer's site.

Each of these pre-planning tasks is described in this chapter

Reviewing System Components

To tailor the system to the customer's business, you must know the number and types of telephones, outside trunks, and adjuncts that were ordered. You will also need to know how the equipment will be used—for example, which employees will get what telephones, which consoles operators will be using, and where adjuncts will be located.

Review the list of equipment ordered and, if you did not participate in the ordering process, you may want to confer with the customer representative at your site who did. You also may want to conduct a premise check to determine if any additional equipment is required.

Obtaining Telephone Company Information

To fill out many of the forms, especially forms involving incoming trunks, you will need to obtain information from the local telephone company. This information includes the following:

- the type(s) of incoming trunks (Loop-Start, Ground-Start, etc.)
- which incoming trunk is connected to each jack on each DID or Tie-Trunk module
- which incoming trunk is connected to each channel on each 100D module, and the order in which the trunks are assigned
- the telephone number for each incoming trunk
- if the disconnect signals for Loop-Start trunks are reliable or unreliable, and what the length of the Hold Disconnect interval is
- which trunks, if any, are rotary dial trunks
- which trunks, if any, require a toll prefix
- the number of digits sent on DID trunks

Confirming the Location of the Control Unit

Before installation, a room, closet, or other area must be designated where the system control unit can be mounted on the wall. The area must meet the environmental requirements in Table 1-1.

Table 1-1. Environmental Requirements

Distances	<ul style="list-style-type: none"> ■ Within 25 cable feet (7.6 m) of the network interface (cannot be installed outdoors) ■ Within 1000 cable feet (304.8 m) of telephones ■ Within 5 cable feet (1.5 m) of a dedicated AC power outlet (1 outlet per carrier)
Heat Dissipation	<ul style="list-style-type: none"> ■ Fully loaded basic carrier: 500 Btu/hr (35 cal/see) ■ Fully loaded 2-carrier: 1000 Btu/hr (70 cal/see) ■ Fully loaded 3-carrier: 1500 Btu/hr (105 cal/see)
Power Requirements	<ul style="list-style-type: none"> ■ Basic carrier: 117 VAC 60 Hz ± 5% 160 W 3 amps ■ 2-carrier: 117 VAC 60 Hz ± 5% 320 W 6 amps ■ 3-carrier: 117 VAC 60 Hz ± 5% 480 W 9 amps ■ 1 properly grounded outlet needed per carrier ■ Additional outlets may be needed if installing printers and PCs.
Temperature Humidity	<ul style="list-style-type: none"> ■ 40°-104°F; 4°-40°C (optimum temperature 60°F; 16°C) ■ 20%-80% relative humidity
Ventilation	<ul style="list-style-type: none"> ■ Allow at least 1 inch (2.5 cm) of space on the right and left sides of the control unit and 12 inches (30.5 cm) above and below the control unit to prevent overheating.

 **CAUTION:**

- *The AC outlet for the control unit should not be switch controlled.*
- *Plugging the control unit into an outlet that can be turned on and off by a switch can cause accidental disconnection of the system.*
- *The AC outlet **must be properly grounded** via an AC receptacle for a 3-prong plug.*
- *Do not install the control unit outdoors.*
- *Do not place the control unit near extreme heat (furnaces, heaters, attics, or direct sunlight).*
- *Do not expose the control unit to devices that generate electrical interference (such as arc welders or motors).*
- *Each auxiliary power unit requires one outlet.*
- *Do not expose the control unit to moisture, corrosive gases, dust, chemicals, spray paint, or similar material.*
- *Do not place anything on top of the carriers.*
- *Do not install under any device that may drip fluid, such as an air conditioner.*

In addition, a 3/4-inch plywood backboard is needed to mount the system on the wall. The dimensions depend on the number of carriers, as shown in Table 1-2. In some areas, fire or electrical codes require a flame retardant backboard. Check with the appropriate authorities to ensure that the proper material is provided.

Table 1-2. Control Unit Space Requirements

Basic carrier	14" w x 23" h x 12" d (35.6 cm x 58.4 cm x 30.5 cm)
Basic carrier + 1 expansion carrier	25" w x 23" h x 12" d (63.5 cm x 58.4 cm x 30.5 cm)
Basic carrier + 2 expansion carriers	37" w x 23" h x 12" d (94 cm x 58.4 cm x 30.5 cm)
Backboard	
Without SYSTIMAX™	6' w x 3' h x 3/4" d (182.9 cm x 91.4 cm x 1.9 cm)
With SYSTIMAX	7' w x 4' h x 3/4" d (213.4 cm x 121.9 cm x 1.9 cm)

It is important that the location selected for the control unit meets all of these specifications and that the backboard is in place before installation. If the location has already been selected and changes are needed, arrange for these changes as soon as possible before installation.

Information about optional backup power and batteries is contained in *Equipment and Operations Reference*.

Grounding Requirements

Proper grounding of the installation site is essential for correct and safe functioning of the system. Grounding protects the system against:

- lightning
- power surges
- power crosses on outside trunks
- electrostatic discharge (ESD)

The telephone company is responsible for providing protection of outside 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 trunk protector ground and the power company ground



CAUTION:

Improper ground can result in equipment failures and service outages. Verify that the AC power uses an approved ground for its primary ground and that all voltage-limiting devices are grounded to an approved ground. Approved grounds are listed 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.

Electrical Noise/Radio-Frequency Interference (RFI)

In most cases, electrical noise is introduced to the system through trunk or telephone cables. However, electromagnetic fields near the control unit may also induce noise in the system. Therefore, the control unit and cable runs should not be placed in areas where a high electromagnetic field strength exists. Radio transmitters (AM or FM), television stations, induction heaters, motors (with commutators) of 0.25 horsepower (200 watts) or greater, and similar equipment are leading causes of interference. Small tools with universal motors are generally not a problem when they operate on separate power lines. Motors without commutators generally do not cause interference.

Field strengths below 1.0 volt per meter are unlikely to cause interference. The field strength produced by radio transmitters can be estimated by dividing the square root of the emitted power in kilowatts by the distance from the antenna in kilometers. This yields the approximate field strength in volts per meter and is relatively accurate for distances greater than about half a wavelength (492 feet, or 150 meters, for a frequency of 1000 kHz).

Obtaining User Information

The features and calling privileges you assign to each employee's telephone ensure that employees get the most benefit from the system.

If you were not involved in the planning and equipment ordering for the system, you should discuss the design with the customer representative from your organization who did.

To determine calling privileges, you need answers to the following questions:

- Does management want to allow both local and toll calls to be made from every telephone?
- If any telephones are restricted, are there any numbers the users should be allowed to call?
- Are there any specific numbers (such as 900) that you want to restrict users from calling?
- Who, if anyone, will be given personal lines?
- Will access to central office trunks (outside lines) be restricted to certain employees?
- Do any departments receive frequent special calls (such as sales and service) so that calls should come to them directly, bypassing a system operator?

You may want to use the Employee Communication Survey form to determine each employee's telecommunications needs. A copy of this form is in Appendix A and is included with the forms package. Since a survey form should be completed for each user, make as many copies of the form as needed. If it is not feasible to have each employee fill out a form, get the information you need from a knowledgeable person in each department, section, or work group. This person should have sufficient information and authority to make decisions about calling features and coverage assignments for others in the department.

Use the information in Table 1-3 to interpret and analyze the results of the Employee Communication Survey.

Table 1-3. Employee Communication—Sample Analysis

1. Types of trunks (outside lines) used	Indicates toll calling habits. In most cases, assigning a button for each trunk is not necessary; the use of Automatic Route Selection (ARS; Hybrid/PBX mode only) ensures that the preferred trunk is selected.
2. Calls covered by someone else (sender)	Suggests that this employee should be assigned as a sender in either Individual or Group Coverage arrangement, particularly if calls are covered by someone other than the operator.
3. Sharing lines/telephone numbers	Identifies Shared System Access buttons and/or common personal line appearances.
4. Cover someone else's calls (receiver)	Suggests assignment as a receiver in someone else's Individual or Group Coverage arrangements.
5. Share incoming calls	Identifies calling group needs.
6. Frequency of use	Identifies heavy and light telephone users. Heavy users may benefit from additional System Access buttons use and/or an additional System Access Originate Only button.
7. Data needs	Identifies existing and potential need data terminal and personal computer users.
8. Use of account codes	Identifies current account codes used for charge-back of calls if there is an account code button on the telephone and if the system includes Call Accounting System (CAS).
9. Frequently dialed numbers	Identifies useful numbers for the System Speed Dial list.
10. Picking up calls	Identifies need for a pickup group.

Obtaining a Floor Plan

You may want to use a floor plan to make planning more manageable and to ensure that the correct telephone equipment is assigned to each employee.

If the customer does not already have a floor plan showing the location of system equipment, you should create one as follows:

1. Use a large sheet of paper and sketch the office layout. The location of office walls and other partitions is important when features are assigned to telephones that must be within hearing range of each other. For example, pickup group members must be able to hear each others' telephones ringing.
2. Indicate the location of each employee's telephone, other locations where there will be a telephone (such as in a conference room), and the locations of data terminals, PCs, and host computers. Use the symbols shown in Figure 1-1
3. Indicate the type of telephone at each location, using an abbreviation that includes the number of programmable buttons. For example, write **MLX-10** at 10-button MLX telephones, **MLX-20L** at 20-button MLX display telephones, **BIS-34** at 34-button analog multiline telephones, and so forth
4. Indicate the type of adjunct at each location. For example, write **FAX** **ans. mach.** (answering machine), **headset**, or other type of adjunct beneath the symbol
5. Indicate any additional equipment, for example, SMDR printer, Call Accounting System device, equipment required for off-premise telephones, etc.
6. Indicate locations at which AC power is available and/or required, for example, for MFMs, a console with two DSSs, or an ISDN 7500B Data Module.

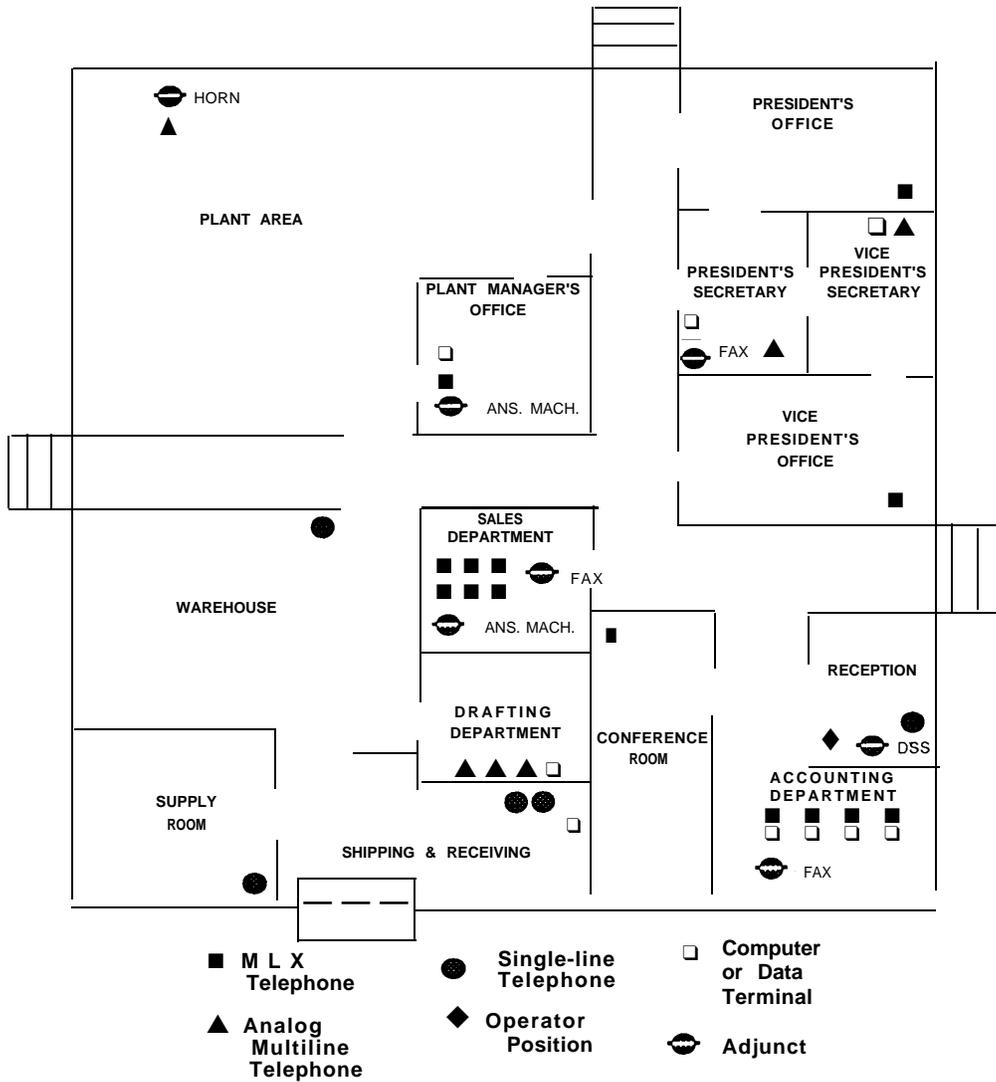


Figure 1-1. Floor Plan

The floor plan does not need to be elaborate or to scale. Keep the floor plan. You will refer to it during planning and complete it (by filling in extension numbers) when you get to “System Numbering” in Chapter 2.

After you have completed the pre-planning tasks described in this chapter, proceed to Chapter 2, “Control Unit Configuration.”

After you have completed the pre-planning tasks described in Chapter 1, you can begin to complete the system planning forms by planning the control unit configuration. Planning the control unit configuration consists of the following tasks:

1. **Planning module placement** - calculating the system's trunk and station capacity according to the number of module types, and then mapping out placement of the modules on the Control Unit Diagram.
2. **Recording system operating conditions** - noting the system's type of programming equipment, mode, and language choice, as well as enabling or disabling the Automatic Maintenance Busy feature.
3. **Numbering the system** - deciding in what order to connect the telephones and other equipment to the control unit, and if the system-assigned extension numbers are appropriate or need to be renumbered.

This chapter contains instructions for completing each of these tasks.

NOTE:

Although the terms "line" and "trunk" technically refer to different facilities, the differentiation is not as clear as it once was and the terms are usually treated as if they were interchangeable. Since the industry trend is toward using "trunk" to refer to either facility, this standard is used in this book.

Forms and Information Needed:

- **Equipment List** (if available)
- **Customer site floor plan**
- **Form 1, System Planning**
- **Form 2a, System Numbering—Station Jacks**
- **Form 2b, System Numbering—Digital Adjuncts**

Planning Module Placement

In addition to the processor module and power supply module, the system supports 14 types of trunk and extension module. Deciding how to place the modules in the basic and extension carriers consists of three tasks:

1. Calculating the system's trunk capacity according to the number of module types.
2. Calculating the system's station capacity according to the number of module types.
3. Mapping out module placement on the Control Unit Diagram according to specific guidelines.

This section contains instructions for each of these tasks.

For information about calculating unit load requirements, see Appendix E.

For detailed information about module types and their specifications (including trunk and station capacity), see the descriptions of hardware components in *Equipment and Operations Reference*.

Forms Needed

- **EquipmentList** (if available)
- **System Form 1, System Planning**

Capacity for Trunks

Trunk capacity is the number of trunks that can be connected to the control unit. This section contains instructions for calculating the system's capacity for trunks according to the system's module types.

Planning Form Instructions

1. In the table under “Trunks” in the “Capacity” section of Form 1, System Planning (page 1), fill in the number of each type of trunk module on the appropriate line of the “Number of Modules” column.
2. Add the column and record the result at the bottom of the column, on the “System Totals” line.
3. For each module type noted, multiply the “Number of Modules” by the number of “Trunks Supported by Module”; write the results on the appropriate line in the “Total Trunks by Module Type” column.
4. Add the column and record the total trunk capacity of the system at the bottom of the column, on the “System Totals” line.

Capacity for Stations

Station capacity is the number of extensions that can be connected to the control unit. In most cases, the number of physical jacks on the modules indicates capacity. The exception is the 100D module, with one physical jack which, because of the system’s software capabilities, supports 24 trunks.

One extension number is automatically assigned to each station jack, whether or not equipment is connected to it, except for the 008 MLX, 408 GS/LS-MLX, and 008 OPT modules:

- **008 MLX and 408 GS/LS-MLX modules** have two extension numbers assigned to each physical jack, the first for a MLX telephone, and the second for any equipment connected to the telephone through and MFM or 7500B Data Module.
- **008 OPT module** has eight physical jacks, which the system reads as 12 jacks; an extension number is assigned to each.

This section contains instructions for calculating the system’s station capacity according to the number of certain module types.

Planning Form Instructions

1. In the table under “Stations” in the “Capacity” section of Form 1, fill in the number of each type of extension module on the appropriate line of the “Number of Modules” column.
2. Add the column and record the result at the bottom of the column, on the “System Totals” line.
3. For each module, multiply the “Number of Modules” by the number of “Physical Jacks per Module” and record the results on the appropriate line in the “Physical Jacks by Module Type” column.
4. Add the column and record the results at the bottom of the column, on the “System Totals” line.

5. To determine the number of extensions assigned for each module type, multiply the number of “Physical Jacks by Module Type” by the number of “Extensions Assigned” and write the results in the appropriate line in the “Total Extensions Assigned” column.

NOTE:

Since the system assigns an additional four extensions to each 008 OPT module, you must first calculate the “Extensions Assigned” by multiplying the number of 008 OPT modules (noted in the “Number of Modules” column) by 4 and then add this subtotal to the number noted in the “Physical Jacks by Module Type” column.

6. Add the column and record the result at the bottom of the column, on the “System Totals” line

Control Unit Diagram—Module Placement

This section describes how to use the “Control Unit Diagram” on Form 1 (page 2) to map out placement of the modules according to certain guidelines.

In addition, this section describes how to identify each jack on each module with respect to type (trunk or extension) and its associated logical ID. Each physical jack on the control unit is numbered sequentially from bottom to top and left to right with logical IDs:

- Extension jacks are numbered from 1 to 144.
- Trunk jacks are numbered from 1 to 80.

This sequence of logical IDs is the basis for how you connect components to the control unit, as well as how the system assigns extension numbers and trunk numbers.

Planning Form Instructions

NOTE:

The “Unit Load” blocks above the diagram are reserved for occasions when equipment changes or maintenance require the technician to compute the values manually.

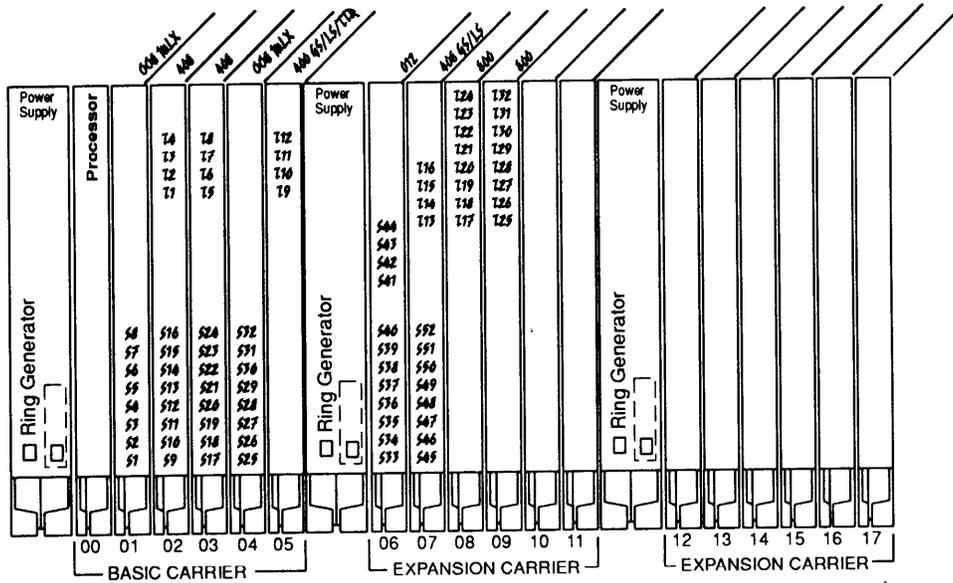
1. On the “Control Unit Diagram” of Form 1 (page 2), record the type of module to be installed in each slot by writing the module name (for example, 008 MLX, 408, etc.) on the slanted lines at the top of each slot using the following guidelines:
 - Put the power supply module in the far left slot of each carrier.
 - Put the processor module in slot 00 of the basic carrier.

- Put trunk and extension modules in any order in slots 01 through 17, with the following conditions:
 - Put the modules in each carrier from left to right with no empty slots between modules. (The system does not recognize modules in slots that follow an empty slot; slots to the right of the last module can be left empty.)
 - (Hybrid/PBX mode only) If the system includes a queued call console (QCC), make its 408 GS/LS-MLX or 008 MLX module the first extension module.
 - (Hybrid/pBX mode only) Put all 012 and 008 OPT modules in the same carrier whenever possible since these modules use a frequency generator.
 - Group all 800 DID, 100D, and 400EM modules together according to type, whenever possible, to save time in system programming.
- 2. If a ring generator is required (for an 012 module or an 008 OPT module) check "Ring Generator" within the illustration of the appropriate Power supply.
- 3. For each trunk and extension jack on each module, write the type of jack (X = extension; and T = trunk) and the associated logical ID, keeping in mind the following:
 - Each 100D module is assigned 24 logical IDs even though the module has only one physical trunk jack.
 - The 008 OPT module is assigned 12 logical IDs even though the module has only eight physical extension jacks.
 - Power Failure Transfer (PFT) jacks are not assigned logical IDs.

NOTE:

If the system will have one or more PFT telephones (maximum of 20), you may want to indicate on the Control Unit Diagram which modules will have a power failure telephone connected to its PFT jack by, for example, writing **PFT** in the appropriate module. A power failure telephone can be connected to a PFT jack on a 400, 400 GS/LS/TTR, 800, 800 GS/LS, 408, 408 GS/LS, or 408 GS/LS-MLX module. Touch-tone PFT telephones must be connected to jacks with touch-tone trunks; rotary-dial PFT telephones must be connected to jacks with rotary-dial trunks.

Figure 2-1 shows a completed "Control Unit Diagram" for a system with 32 trunks and 52 extensions.



Recording System Operating Conditions

This section contains instructions for recording the following system operating conditions:

- programming equipment that will be used and its extension jack assignment
- mode of operation
- language choice
- whether Automatic Maintenance Busy is enabled
- a reminder to set the system time and date

Forms Needed:

System Form 1, System Planning

Programming Equipment

Two types of equipment can be used for system programming:

- an MLX-20L™ telephone identified as a system programming console. The telephone is the first (lowest) extension jack on the first MLX module and is factory-set for system programming.
- a personal computer (PC) with System Programming and Maintenance (SPM) software. The PC is connected to the lower jack on the processor module.

Planning Form Instructions

1. Under the “Programming Equipment” heading in the “System Operating Conditions” section on Form 1 (page 2), do *one* of the following:
 - If using a system programming console, check “System Programming Console.” Proceed to Step 2.
 - If using a PC with SPM software to program the system, check “PC with SPM Software” and skip to the next section, “System Mode.”
2. To change the factory-set system programming jack, write in the new logical ID using the information from the “Control Unit Diagram.”

NOTE:

In addition to being factory-set for system programming, the first (lowest) extension jack on the first MLX module is also factory-set as the primary operator position. Since the primary operator position cannot be reassigned to another extension jack, you may want to change the system programming assignment to ensure that future programming sessions do not interfere with the operator's work.

If you want the system programming jack to be different from that of a system operator, change the programming assignment to any one of extension jacks 2 through 5 on the first MLX module in the control unit.

You will fill in the extension number of the jack later.

System Mode

The mode of operation determines how outside trunks are provided to users, the types of operator consoles allowed, and the features available and how they work.

Each system is registered with the FCC to operate as a Private Branch Exchange (PBX), Hybrid, or Key system. However, you can program the system to operate in any of the following three modes:

- Hybrid/PBX
- Key (the factory setting)
- Behind Switch

For detailed descriptions of each of these modes, see *Equipment and Operations Reference*.

Planning Form Instructions

Under the "System Mode" heading in the "System Operating Conditions" section of Form 1 (page 2), check *one* of the following:

- If the system will operate in Key mode, check "Key." (This is the default.)
- If the system will operate in Hybrid/PBX mode, check "Hybrid/PBX."
- If the system will be connected behind a larger system or a Centrex System, check "Behind Switch" and record the host's dial codes for the Transfer, Conference, and Drop features.

Language Selection

For Releases 1.1 and later of the system, language-specific operation is available in English, French, and Spanish. The language selection affects prompts and displays on user telephones, SPM system administration displays, and Station Message Detail Recording (SMDR) and printed reports.

This feature is implemented as follows:

- The MLX-10D™, MLX-20L, and MLX-28D™ display telephones and the MLX-10™ non-display telephones are available in three separate versions, each with the factory-imprinted buttons in the language of choice.
- The system can be programmed to operate in one of the languages on a system-wide basis, but an individual user with the appropriate MLX telephone can override the system language by selecting any one of the three languages for their own telephone.

This section describes how to record which language will be selected for the system and, if desired, to set a different language for SMDR and printers.

NOTE:

To select a different language for an individual telephone, record the language selection on the form for that telephone (Form 4b, 4d, 4f, 5a, 5b, 5d) as described in Chapter 4.

Planning Form Instructions

Under the "Language Selection" heading in the "System Operating Conditions" section of Form 1 (page 2):

1. To select a system-wide language, check *one* of the following:
 - English (the default)
 - French
 - Spanish
2. To set a different language for SMDR, check *one* of the following:
 - English (the default)
 - French
 - Spanish
3. To set a different language for printed reports, check *one* of the following:
 - English (the default)
 - French
 - Spanish

Automatic Maintenance Busy

The factory setting for Automatic Maintenance Busy is “disabled,” which means that faulty trunks are **not** automatically put in a maintenance-busy state.

In Key and Behind Switch modes, Automatic Maintenance Busy is usually disabled. If you plan to group trunks into pools in Hybrid/PBX mode, it is recommended that you enable Automatic Maintenance Busy for optimum system performance.

For a detailed description of this feature (including considerations and feature interactions), see *Feature Reference*.

Planning Form Instructions

Under the “Automatic Maintenance Busy” heading in the “System Operating Conditions” section of Form 1 (page 2), do *one* of the following:

- To keep the factory setting (no maintenance busy state), check “Disable.”
- To enable the Automatic Maintenance Busy feature, check “Enable.”

Set System Date and System Time

The system date and time is the month, day, year, and time shown on display telephones and SMDR reports. (For information on SMDR, see “System Features” in Chapter 4.) The system date and time is also shown on error reports used by authorized technicians for maintenance.

These sections are included on the planning form as a reminder to set the system date and time when the initial programming for the system is performed.

Planning Form Instructions

Check “Yes” under the “Set System Date” and “Set System Time” headings on Form 1 as a reminder to set the current date and time.

System Consoles

As an aid for programming, use this section to summarize information about the consoles in the system.

Planning Form Instructions

Under the “System Consoles” heading, check the type(s) of consoles (QCC or DLC) and enter the extension numbers (if known).

Applications

Several call handling and management applications can be used with the system, including voice mail and messaging, call accounting and reporting, and call management, distribution, and reporting. This section contains instructions for noting those applications that will be used with this system.



CAUTION:

*General information about these applications is contained in Equipment and Operations. However, to ensure proper service, you **must** review the documentation provided with the application itself*

Planning Form Instructions

On Form 1, Pages 3 and 4:

1. Check each application that will be connected to the system.
2. For each application you check, you may wish to include pertinent information in the "Notes" section, for example, if you want to associate extension or port numbers with a MERLIN PFC™ telephone, or to note the version of the application installed at the customer's site.

Numbering the System

This section describes the assignment of numbers to extensions.

NOTE:

Assigning numbers to calling groups, paging groups, park zones, and remote access is described later in this book.

The process of numbering extensions involves three tasks:

1. **Identifying Extension Jacks** - Using the placement of modules in the control unit as a guide (see "Control Unit Diagram" on Form 1), determine in what order to connect telephones and other equipment to the control unit. To do this, you identify the extension jack types available by module and then match system components (for example, operator positions or telephone types) with the jacks that support them.
2. **Renumbering (if necessary)** - Changing the system-assigned extension numbers for all or selected extensions if they are not appropriate for the customer's business. The system offers two predetermined numbering plans (2-digit and 3-digit numbers), as well as the option of creating a unique numbering plan with extensions of one to four digits. Each of these three plans allows renumbering of all or selected extensions.
3. **Updating Planning Information** - Adding information on Form 1 and the Floor Plan as appropriate.

This section contains instructions for completing each of these tasks.

Detailed information about system numbering and the three numbering plans is contained in *Feature Reference*.

Forms Needed:

- **Floor Plan**
- **Equipment List** (if available)
- **System Form 1, System Planning**
- **System Form 2a, System Numbering—Station Jacks**
- **System Form 2b, System Numbering—Digital Adjuncts**

Identifying Extension Jacks

Identifying extension jacks consists of two tasks:

1. Determining which extension jack types are available according to the types of modules in the control unit

2. Matching the telephones and other equipment to the jacks that support them in the following order:

- primary operator position
- additional operator positions
- extension jack pairs (for Voice Announce to Busy and/or Simultaneous Voice and Data features) — Analog Multiline telephones only
- MLX telephones
- analog multiline telephones
- tip/ring equipment and applications

This section contains instructions for completing both of these tasks.

Planning Form Instructions

Before you begin completing the forms as described in this section, review the Floor Plan and Equipment List (if available) to identify the equipment and the number of each kind of connection that are needed, as well as to obtain other information you will need to fill in on the forms:

- Number, type(s), user name and/or location of operator consoles
- Number, user name and/or location of analog multiline telephones that will use the Voice Announce to Busy or Simultaneous Voice and Data features.
- Number of non-operator MLX telephones, and user names and/or locations
- Number, and user name and/or location of analog multiline telephones
- Number, and user name and/or location of tip/ring equipment
- Names of optional applications

Module Types and Extension Jack Types

Extension jack type is determined by the module type. For example, the 012 module has 12 basic jacks. The extension jack types and the equipment that can be connected to these jacks are listed in Table 2-1.

Table 2-1. Extension Jack Types

Module Type	Extension Jack Type	Number of Jacks	Used to Connect
008 ATL 408 LS ATL 408 ATL GS/LS	Analog	8 8 8	Analog multiline telephones Call Management System (CMS)
008 MLX 408 GS/LS-MLX	Digital	8 8	MLX telephones Digital data devices, such as ISDN* 7500B Data Modules
012	Basic Telephone	12	Tip/ring equipment: Single-line telephone Adjuncts, such as answering or fax machines Optional applications: MERLIN MAIL™ Voice Messaging System AUDIX Voice Power—IS II or III integrated Voice Power Automated Attendant — IS II or III
008 OPT		8 **	Tip/ring equipment in another building or off-premise

*ISDN (Integrated Services Digital Network) is a series of recommended communications standards issued by the International Telegraph and Telephone Consultative Committee (CCITT).

** The system reserves 12 logical IDs for an 008 OPT module even though only eight are used. Do not use an 008 OPT module for applications such as AUDIX Voice Power, MERLIN Mail, or MERLIN Attendant.

Forms Needed:

- **System Form 1, System Planning**
- **System Form 2a, System Numbering—Station Jacks**

Planning Form Instructions

Use the completed “Control Unit Diagram” (Form 1) and Table 2-1 for reference to mark the extension jack types on Form 2a:

1. For each extension module noted in the “Control Unit Diagram” (beginning with slot 01), write in the type of module in the “Mod. Type” column of Form 2a and, after the appropriate logical ID (“Log. ID”) number, draw a line to indicate the end of that module.

For example, if the first module in the control unit is an 008 MLX module which has 8 jacks, write **008 MLX** in the “Mod. Type” column, and draw a line after logical ID “8.”

NOTE:

If your list includes an 008 OPT module, draw a line after the twelfth logical ID but cross off the last four logical IDs since they cannot be used to physically connect telephone equipment. However, the extension numbers of these logical IDs may be used for applications requiring phantom extensions.

2. In the “Jack Type” column of Form 2a, do *one* of the following to indicate the type of each extension jack next to its logical ID:
 - If the jack is analog, check “A”.
 - If the jack is digital, check “D”.
 - If the jack is basic telephone, check “B”.

You are now ready to match the system telephones and other equipment to these available jacks. Begin with the next section, “Jacks for Primary Operator Position,” and proceed through the subsequent sections as appropriate for the system.

Jacks for Primary Operator Position

The factory setting for the primary operator position is the lowest extension jack on the first 008 MLX module. If the system doesn’t have an MLX module, it’s the lowest extension jack on the first module with analog extension jacks. The factory setting for the primary operator position cannot be changed.

Two types of operator consoles can be used in the primary operator position:

- **Direct-Line Console (DLC)** - can be assigned to either a digital or analog extension jack.
- **Queued Call Console (QCC)** - can be assigned only to digital extension jacks, and the MLX-20L is the only telephone that can be used as a QCC.

If the system includes QCCs, the primary operator position must be a QCC.

Planning Form Instructions

Mark jack assignments on Form 2a:

1. Do *one* of the following
 - If the system uses a system programming console, proceed to Step 2.
 - If the system does not use a system programming console, skip to Step 5.

2. Obtain the logical ID of the extension jack for the system programming console by referring to the "System Operating Conditions" section on the back of Form 1.
3. Identify the logical ID for the system programming console by writing `spc` beside the appropriate logical ID in the "Log. ID" column of Form 2a.
4. Write the name of the person who will be programming the system or the location of the system programming console in the "Person, Location, or Function" column.
5. Do *one* of the following:
 - If the system has one or more QCCS, proceed to Step 6.
 - If the system has one or more DLCS, skip to Step 7.
6. To indicate the primary QCC operator position:
 - a. Locate the first extension jack showing a "D" (digital) type, and write `qcc` beside the preprinted logical ID number.
 - b. Write the name or location of the primary QCC operator in the "Person, Location, or Function" column.
 - c. On Form 1, page 2, write the extension of the QCC under "System Consoles."
7. To indicate the primary DLC operator position
 - a. Locate the first extension jack showing a "D" (digital) or "A" (analog) type, and write `dlc` beside the preprinted logical ID number.
 - b. Write the name or location of the primary DLC operator in the "Person, Location, or Function" column.
 - c. On Form 1, page 2, write the extension of the DLC under "System Consoles."

Proceed to the next section, "Jacks for Additional Operator Positions."

Jacks for Additional Operator Positions

Use these instructions only if the system has more than one operator position. Otherwise, skip to the next section, "Extension Jack Pairs."

The maximum numbers of both types of operator positions are shown in Table 2-2.

Table 2-2. Maximum Number of Operator Positions

Position Type	Telephone Type	Maximum Positions
QCC	MLX-20L	4
DLC	MLX-20L MLX-28D	8
DLC	Analog multiline telephones	8

Any combination of operator positions can be assigned as long as no more than four are QCCs and the total combined number is no more than eight. For example, a system can have a combination that consists of four QCCs, two MLX DLCs, and two analog DLCs. The CMS equipment is connected to analog extension jacks that are assigned as DLC positions. You must assign two DLC positions for each CMS (a maximum of two) connected to the system on analog multiline modules.

Planning Form Instructions

1. On the “Control Unit Diagram” on Form 1, determine which extension jacks can be used as operator positions by circling the first and fifth extension jacks on digital or analog modules until you have reached the maximum number of eight positions.
2. On Form 2a, mark the extension jacks to be used as additional operator positions.
3. Do *one* of the following:
 - If the system has additional QCCs, proceed to Step 4.
 - If the system has additional DLCs, skip to Step 5.
4. For each additional QCC:
 - a. Write **qcc** next to the preprinted logical ID for each additional QCC position. Be sure to assign QCCs to only the first and fifth extension jacks on each digital module.
 - b. Write the name or location of each additional QCC operator in the “Person, Location, or Function” column.
 - c. On Form 1, page 2, write the extension number of each additional QCC under “System Consoles.”

5. For each additional DLC:

- a. Write **DLC** next to the preprinted logical ID for each additional DLC position (including DLC positions used for calling group supervisors and for the optional CMS. Be sure to assign DLCs to only the first and fifth extension jacks on each digital or analog module.

NOTE:

For each CMS (a maximum of two) connected to the system, you must assign two DLC positions.

- b. Write the name or location of each additional DLC operator in the "Person, Location, or Function" column.
- c. On Form 1, page 2, write the extension number of each additional DLC under "System Consoles."

6. If the system includes any Call Management Systems, write **CMS** in the "(Person, Location, or Function" column next to the logical ID for the two DLC positions assigned for each CMS.

NOTE:

These two DLCs do *not* need to have the default extension numbers but do need to be on the same module.

Proceed to the next section, "Extension Jack Pairs."

Extension Jack Pairs

Use these instructions only if the system has analog multiline telephones. Otherwise, skip to the next section, "Jacks for MLX Telephones."

Two of the optional features for analog multiline telephones require an additional extension jack:

- Voice Announce to Busy
- Simultaneous Voice and Data

NOTE:

MLX telephones can use these features without requiring a second extension jack.

The jacks are an odd-numbered analog extension jack and the next higher (even-numbered) analog extension jack. The system assigns individual extension numbers to each of the jacks. The extension number associated with the first (odd-numbered) extension jack in the pair is the telephone's extension number. Calls cannot be placed to the extension number associated with the even-numbered extension jack. (For information about how the jacks are numbered, see "System Renumbering" later in this chapter.)

You can assign either of these features to any of the analog multiline telephones in the system, but you cannot assign both to the same telephone.

Planning Form Instructions

On Form 2a, mark the pairs of jacks for analog multiline telephones that have the Voice Announce to Busy or Simultaneous Voice and Data feature:

1. In the “Logical ID” column, draw a box around the pair of extension jack numbers that you plan to assign to each analog multiline extension with either feature.
2. In the “Person, Location, or Function” column, next to the first (odd) number of each boxed pair, identify the extension by person or location.
3. In the “Person, Location, or Function” column, next to the second (even) number of each boxed pair, do *one* of the following:
 - For the Voice Announce to Busy feature, write `voice/voice`.
 - For the Simultaneous Voice and Data feature, write `voice/data`.

Proceed to the next section, “Jacks for MLX Telephones”

Jacks for MLX Telephones

Use these instructions only if the system has non-operator MLX telephones to assign to digital extension jacks on 008 MLX modules. Otherwise, skip to the next section, “Jacks for Analog Multiline Telephones.”

NOTE:

To plan connections for digital data equipment, see Chapter 6.

Although only one logical ID is assigned to each digital extension jack, the system assigns two extension numbers. The extension number on Form 2a is the extension number automatically assigned to an MLX telephone connected to the digital extension jack. The second extension number is reserved for an adjunct such as an answering machine that may be connected to the MLX telephone via a Multi-Function Module (MFM) or for an ISDN 7500B Data Module used to connect a data terminal. (For information about how jacks are numbered, see “System Renumbering” later in this chapter.)

The system automatically assigns both extension numbers whether or not the extension includes an MFM or data module. Calls can be placed to both extension numbers independently.

The MFM can operate as either a Supplemental Alert Adapter (SAA) or as a tip/ring interface. The SAA setting on the MFM is used when the MFM connects an external alert such as a bell or horn. The tip/ring setting is used when the MFM connects a tip/ring device such as an answering machine or modem.

Planning Form Instructions

Use the Floor Plan and Equipment List (if available) to verify that you have located all remaining MLX telephones and adjuncts connected to them:

1. On Form 2a, mark the extension jack assignments for the remaining MLX telephones:
 - a. In the “Jack Type” column, make sure there is a “D” checked next to the logical ID for each digital extension jack.
 - b. In the “Person, Location, or Function” column, identify each MLX telephone by person, location, or function.
2. Using the information from Form 2a, mark the digital extension adjuncts on Form 2b, System Numbering—Digital Adjuncts:
 - a. In the “Log. ID” column, write the logical ID of each digital extension jack (that is, each “D” jack type).

NOTE:

You will fill in the “Factory-Set Extension No. ” column later in this chapter.

- b. Do *one* of the following:
 - If the jack does not have an adjunct connected, write **None** across the “MFM” and “7500B” columns and skip to Step 3.
 - If an adjunct is connected to the MLX telephone, proceed to Step c.
- c. If an adjunct is connected to the MLX telephone, do *one* of the following:
 - Check “SAA” or “T/R” in the “MFM” column to show how the MFM connects the adjunct.
 - Check the “7500B” column if the extension includes the data module.

3. In the last column, identify each adjunct or data module by type and by person, location, or function and record the equipment type.

Proceed to the next section, “Jacks for Analog Multiline Telephones.”

Jacks for Analog Multiline Telephones

Use these instructions only if the system includes 408 LS/ATL, 408 GS/LS ATL, or 008 ATL modules. Otherwise, skip to the next section, “Jacks for Tip/Ring Equipment and Applications.”

Assign analog extension jacks for all remaining non-operator analog multiline telephones in the system.

Planning Form Instructions

On Form 2a, mark the extension assignments for the remaining analog multiline telephones:

1. In the “Jack Type” column, make sure there is an “A” checked next to the logical ID for each analog extension jack.
2. In the “Person, Location, or Function” column, identify each analog multiline telephone by person, location, or function.

Jacks for Tip/Ring Equipment and Applications

Use these instructions only if the system includes 012 or 008 OPT modules. Otherwise, skip to the next section, “Labels.”

Assign the basic telephone jacks on the 012 or 008 OPT modules to any tip/ring equipment such as single-line telephones, fax machines, or answering machines.

Several optional applications, if used with the system, require a basic jack on a 012 module: MERLIN MAIL Voice Messaging System, MERLIN Attendant, AUDIX Voice Power—Integrated Solution II (IS-II) or III (IS-III), and Integrated Voice Power Automated Attendant—IS-II or IS-III.

NOTE:

If the system has AUDIX Voice Power, the Integrated Administration feature provides a single interface through Integrated Solution III (IS-III) for programming entries common to the system and to the AUDIX Voice Power system. These common entries are noted on the planning forms and instructions for planning the system in conjunction with planning for the AUDIX Voice Power system are included in the procedures throughout this book. For more information on this and other applications, see *Equipment and Operations Reference*.

Generally, up to four application ports (for example, for AUDIX Voice Power) can be connected to the system using the same 012 module. **If there are four application ports, the module must be used exclusively for this equipment.** If you have fewer than four application ports connected to a 012 module, some tip/ring devices can also be connected. If possible, the module should be used only for the application equipment. These limitations are due to the number of TTRs in the system and the Ring Generator’s ability to ring ports (only four ports can ring at a time). Table 2-3 shows, by application, the number of ports used, the number of TTRs required, and the number of additional single-line telephones that can be added to the modules. Use this table as a guideline.

Table 2-3. Application Ports

Application	Ports	TTRs	Telephones
MERLIN Mail	2	1	3 + 1 for the modem
	4	2	2 + 1 for the modem
MERLIN Attendant	1	1	3 + 1 for administration
	2	1	3 + 1 for administration
	3	2	3 + 1 for administration
	4	2	2 + 1 for administration
AUDIX Voice Power	2	1	3
	4	2	2
	6	3	1
	8	4	0
	12	6	0

NOTE:

The applications discussed here do not work properly with 012 modules manufactured for older MERLIN® II systems. These applications must be connected to 012 modules with the code 517C13 or 517D13 or later on the label on the top of the module. Modules with the code 517A13 or 517B13 can be used to connect only single-line telephones and do not provide the disconnect signal required by answering machines and applications. Do not use the 008 OPT module for applications such as AUDIX Voice Power, MERLIN Mail, or MERLIN Attendant.

Planning Form Instructions

On Form 2a, mark the extension jack assignments on the 012 and 008 OPT modules:

1. In the "Jack Type" column, make sure there is a "B" checked next to the logical ID for each basic telephone jack.
2. In the "Person, Location, or Function" column, identify each tip/ring device by person or location and by type, such as single-line telephone, fax, or answering machine.
3. If the system includes optional applications, indicate the type of application on the appropriate line in the "Person, Location, or Function" column:

- To indicate MERLIN MAIL Voice Messaging System, write **Mail**.
- To indicate MERLIN Attendant, write **MERLLIN A**.
- To indicate AUDIX Voice Power—IS II or IS III, write **AVP**.
- To indicate Integrated Voice Power Automated Attendant-IS II, write **IVP-AA**.

4. If the system has AUDIX Voice Power, put a checkmark on the appropriate line(s) in the “AUDIX Voice Power” column for subscribers, or write **port** in the same column for any logical IDs that are being used for fax ports.

Proceed to the next section, “Labels.”

Labels

This section contains instructions to associate alphanumeric labels with extension numbers so that both the name of the caller and the extension number are displayed on display telephones.

Planning Form Instructions

On Form 2a, write the label (maximum: 7 characters) to be displayed for each telephone on the appropriate line in the “Label” column.

Proceed to the next section, “System Renumbering.”

System Renumbering

The selection of a numbering plan depends on the customer’s needs. Each of the system’s three numbering plans allows you to renumber-all or selected extensions.

Figures 2-2 through 2-4 list the extension numbers according to the three numbering plans: 2-digit, 3-digit, and Set Up Space. The numbers are arranged in blocks according to the first digit. The type of equipment or feature to which they are assigned is shown in the block. The shaded areas of the table indicate extension numbers automatically assigned by the system. The unshaded areas indicate the extension numbers available for reassignment.

For detailed information about the numbering plans (including considerations and constraints, and feature interactions that may impact selection), see *Feature Reference*.

Use the appropriate plan-specific instructions that follow to mark Forms 2a and 2b with extension number assignments. If you don’t need to renumber extensions, skip to the last section in this chapter, “Updating Planning Information.”

NOTE:

If the system includes the Call Management System (CMS), it assigns extension numbers to agent splits. The CMS agent extension numbers must be 2 digits. Therefore, the 2-digit numbering plan should be used for CMS. For more information, see the CMS documentation.

0	Operator Console (not flexible)				
	0				
1	Stations 1 0 - - - 1 9				
2	Stations 2 0 - - - 2 9				
3	Stations 3 0 - - - 3 9				
4	Stations 4 0 - - - 4 9				
5	Stations 5 0 - - - 5 9				
6	Stations 6 0 - - - 6 7		Extra Stations 6880---6885	6886- 6889	Extra Adjuncts 6986- 6999
7	Main Pool 7 0	MFMs/7500Bs 710---767	768, 769	Calling Group 770---791, 7920---7929	
8	800*	Trunks 801---880	Park 881---888	889**	Pools 890---899
9	ARS Access (Hybrid/PBX Mode) / Idle Line Access 9				

* Listed Directory Number (QCC Queue).

** Remote Access

Figure 2-2. 2-Digit Numbering Plan

0	Operator Console (not flexible) 0			
1	Stations 100---199			
2	Stations 200---243	244-299		
3	MFMs/7500Bs 300---399			
4	MFMs/7500Bs 400---443	444-499		
5	500-599			
6	600-699			
7	Main Pool 70	71-76	Calling Group 770---791, 7920---7929	Page 793---799
8	800*	Trunks 801---880	Park 881---888	889** Pools 890---899
9	ARS Access (Hybrid/PBX Mode)/Idle Line Access 9			

*Listed Directory Number (QCC Queue)

**Remote Access

Figure 2-3. 3-Digit Numbering Plan

0	Operator Console (not flexible)						
1	100-199						
2	200-299						
3	300-399						
4	400-499						
5	500-599						
6	600-699						
7	Main Pool 7 0	Stations 7100---7243	7243- 7299	MFMs/7500Bs 7 3 0 0 --- 7 4 4 3	7444- 7 6 9 9	Calling Group 770---791, 7920---7929	Page 793---799
8	800*	Trunks 8 0 1 - 8 8 0			Park 881---888	889*	Pools 890---899
9	ARS Access (Hybrid/PBX Mode) Idle Line Access						

* Listed Directory Number (QCC Queue).
 ** Remote Access

Figure 2-4. Set Up Space Numbering Plan

Planning Form Instructions

Use Figures 2-2 through 2-4 as you record extension number information:

1. If the system includes digital extension adjuncts, then do *one* of the following on Form 2b, System Numbering—Digital Adjuncts:
 - For a 2-digit numbering plan, write the 3-digit adjunct extension number—the extension number from Form 2a with a “7” preceding it—in the “Factory-Set Extension No. ” column of Form 2b.
 - For a 3-digit numbering plan, write the 3-digit extension number—the extension number from Form 2a increased by 200 (within the range 300 through 443)—in the “Factory-Set Extension No.” column of Form 2b.
 - For a Set Up Space numbering plan, write the 4-digit extension number—the extension number from Form 2a increased by 200 (within the range 7300 through 7443)—in the “Factory-Set Extension No.” column of Form 2b.

2. Do *one* of the following:

- If you do **not** need to renumber any of the factory-set extension numbers:
 - a. Depending on the numbering plan you're using, check "2-Digit," "3-Digit," or "Set Up Space" box under the "Renumber System" heading on Form 2a.
 - b. Skip to the next section, "Updating Planning Information."
- If you want to renumber only a few of the extensions (and, for 2- and 3-digit numbering plans, there are enough numbers available):
 - a. Depending on the numbering plan you're using, check "2-Digit," "3-Digit," or "Set Up Space" and check "Selected Extension Numbers" under the "Renumber System" heading on Form 2a.
 - b. Write the new extension number(s) in the "Renumber To" column on Form 2a and Form 2b.

NOTE:

If you renumber the system after programming phantom stations, you will lose them.

Proceed to the next section, "Updating Planning Information."

Updating Planning Information

On the Floor Plan, add the extension number beneath the description of each telephone and adjunct.

On Form 1, System Planning, in the "System Operating Conditions" section, if you are using a system programming console, add the new extension number of the console in the space next to "Ext. No."

NOTE:

The remaining columns on Form 2a ("Eqpt.," "Label," "Old Ext. No.," and "Wire No.") will be completed by the technician during installation.

To complete the forms for trunks, proceed to Chapter 3.

Planning for trunks consists of the following tasks:

1. **Identifying Trunk Jacks** - Using the placement of modules in the control unit as a guide (see “Control Unit Diagram” on Form 1), determine in what order to connect trunks to the control unit. To do this, you identify the trunk jack types available by module and then match trunks and auxiliary equipment with the jacks that support them.
2. **Selecting Trunk Options** - Choosing from available options for the incoming trunks connected to the system depending on the requirements of the system.
3. **Assigning Trunks to User Extension** - Assigning trunks to telephones, DLCs, and QCCs.
4. **Assigning Telephone Buttons** - Assigning buttons to PBX and Key mode telephones and to DLCs.

This chapter contains instructions for completing each of these tasks. Detailed information about trunks is contained in *Equipment and Operations Reference*. It is recommended that you be familiar with trunk types and options, as well as the requirements of this system before you attempt to perform the procedures in this chapter. It is also critical that you understand what services the local telephone company can provide.

Forms and Information Needed:

- Floor Plan
- System Form 1, System Planning
- System Form 2c, System Numbering—Trunk Jacks

- **System Form 2d, System Numbering—Special Renumbers**
- **System Form 3a, Incoming Trunks—Remote Access**
- **System Form 3b, Incoming Trunks—DS1 Connectivity (100D Module)**
- **System Form 3c, Incoming Trunks—Tie**
- **System Form 3d, Incoming Trunks—DID**
- **System Form 4b, Analog Multiline Telephone**
- **System Form 4d, MLX Telephone**
- **System Form 5b, Direct-Line Console (DLC)—Digital**

In addition, you will need trunk information from the local telephone company.

Identifying Trunk Jacks

Identifying trunk jacks consists of three tasks:

1. Determining which trunk jack types are available according to the types of modules in the control unit.
2. Matching incoming trunks to the jacks that support them.
3. Designating jacks for auxiliary equipment (if any).

This section contains instructions for completing all of these tasks.

Forms/Information Needed:

- **Form 1, System Planning**
- **Form 2c, System Numbering—Trunk Jacks**
- Local telephone company trunk information

Module Types and Trunk Jack Types

The trunk jack type is determined by the type of module. Table 3-1 lists the trunk jack types and the incoming trunk or auxiliary equipment that can be connected to these jacks.

Table 3-1. Trunk Jack Types

Module Type	Trunk Jack Type	Number of Jacks	Used to Connect
400 LS/TTR 800 LS 408 LS ATL	Loop-start (LS)	4 8 4	Trunk Types: <ul style="list-style-type: none"> ■ Basic ■ Special Purpose (FX, WATS) Auxiliary Equipment: <ul style="list-style-type: none"> ■ Music-on-Hold ■ Loudspeaker Paging System ■ Maintenance Alarm
400 GS/LS/TTR 800 GS/LS 408 ATL GS/LS 408 GS/LS-MLX	Ground-start/Loop-start (GS/LS)	4 8 4 4	Trunk Types: <ul style="list-style-type: none"> ■ Basic ■ Special Purpose (FX, WATS) Auxiliary Equipment: <ul style="list-style-type: none"> ■ Music-on-Hold ■ Loudspeaker Paging System ■ Maintenance Alarm
800 DID (Hybrid/PBX mode only)	DID	8	DID
400EM	Tie	4	Tie
100D	DS1	1 (24 channels)	T1 PRI

For detailed information about the module types and their specifications, see the hardware descriptions in *Equipment and Operations Reference*. For detailed information about trunk types (including DS1 facilities and the 100D module), see the functional description of the system in the same book.

NOTE:

You cannot mix T1 and PRI types of service on the same 100D module. Any of the following AT&T Switched Network (ASN) Services can be provided through a T1 or PRI trunk: Megacom® WATS, Megacom 800, Software Defined Network (SDN), and MultiQuest®. However, T1 supports Megacom 800 and MultiQuest with or without Dialed Number Identification Service (DNIS), and also supports Shared Access for Switched Services (SASS). PRI supports Megacom 800 and MultiQuest only without DNIS, supports Megacom WATS and Megacom 900 only on a call-by-call basis, and provides ACCUNET® switched digital service for certain data calls.

Planning Form Instructions

Use the completed “Control Unit Diagram” on Form 1 for reference to mark trunk jack types on Form 2c:

1. For each module with trunk jacks noted in the “Control Unit Diagram” (beginning with slot 01), write in the type of module and its slot number in the “Module Type and Slot No.” column of Form 2c and, after the appropriate “Log. ID” number, draw a line to indicate the logical IDs (and therefore, the trunk jacks) that correspond to that module.

NOTE:

If the system has 100D (DS1) modules, keep in mind that even though there is only one physical jack on the module, the 100D module supports up to 24 endpoints or ports. Therefore, 24 logical IDs and associated trunk numbers are assigned to each module.

2. In the “Jack Type” column of Form 2c, for all modules except any 100D modules, write the jack type for each logical ID using the codes shown in Table 3-2.

Table 3-2. Codes for Trunk Type

Jack Type Code	Trunk Type
LS	Loop-Start
GS/LS	Ground-Start/Loop-Start
DID	DID
Tie	Tie
T1-GS	DS1 connectivity used to emulate GS
T1-LS	DS1 connectivity used to emulate LS
T1-Tie	DS1 connectivity used to emulate tie or for digital service
PRI	DS1 connectivity used for PRI service

3. For systems that include a 10OD module, do *one* of the following in the “Jack Type” column:

- If the module is used to emulate trunks, do *one* of the following:

- For the channels that are being used, write the jack type codes (see Table 3-2) for those trunks.

- For the channels not being used at this time, write **T1**,

- If the module is used to connect services (for example, Megacom, Megacom 800, etc.), write **PRI** for all 24 logical IDs of PRI-type modules.

You are now ready to match incoming trunks to these available jacks as described in the next section.

Incoming Trunk Type

Use the procedure in this section to match incoming trunks to the continuous sequence of trunk jacks on the control unit, beginning with the first trunk jack (logical ID 1).

NOTE:

(Key Mode Only) If the system is registered with the FCC registration number of AS59CM-7914-KF-E, only loop-start trunks can be connected to the GS/LS type trunk jacks if the processor module has been modified for Key only. With the KF registration number, ground-start trunks are allowed only when the system includes DS1 connectivity dedicated as a T1 type and the channels are used to emulate ground-start trunks,

Also included in this procedure are instructions for assigning a label to identify the trunk being used.

Planning Form Instructions

1. In the “Incoming Trunk Type” column of Form 2c, write the type of trunk you plan to connect to each trunk jack or T1 channel—Main No., Personal line, FX (Foreign Exchange), WATS (include band), DID, Tie. (Refer to the local telephone company trunk information.) Use the following guidelines:
 - Group trunks together according to type: basic loop-start trunks, basic ground-start trunks, special-purpose loop-start or ground-start trunks. (DID, PRI, T1, and tie trunks are automatically grouped according to type since they require specific types of modules. The local telephone company supplies the information you need to identify the specific trunks connected to each trunk jack on each DID and tie-trunk module and each channel on each 100D module.)
 - Use trunk jacks at the beginning of the sequence for basic ground-start and/or basic loop-start trunks. Use jacks later in the sequence for special-purpose trunks such as WATS or FX.
 - If a trunk such as WATS is only inbound or outbound (not two-way), include that information along with the trunk type.
2. If the jack type shown in the “Jack Type” column is GS/LS, then next to the trunk type, write either **GS** or **LS** to indicate the trunk type. For a T1 trunk not used at this time, write **unequipped**.

NOTE:

For other T1 or PRI trunks, the kind of service connected (such as Megacom 800) will be filled in later.

3. In the “Telephone Number or Equipment” column, write the telephone number for each incoming trunk (as supplied by the local telephone company) on the line with the logical ID for its trunk jack. If you don’t yet know the telephone number, leave the column blank and enter the information later.

NOTE:

Be sure the trunk type associated with each telephone number matches the jack type. Also, if you have dedicated 100D module channels to emulate loop-start, ground-start, and/or tie trunks, the local telephone company will supply the telephone number associated with each of the channels on the DS1 service.

4. In the “Label” column, write the label for each trunk on the appropriate line. The labels can contain up to 7 characters, including capital letters, numbers, ampersand (&), dash (—) space, colon (:), asterisk (*) and pound sign (#).

The remaining entries on this form are covered in "Selecting Trunk Options" later in this chapter.

An example of a partially completed Form 2c is shown in Figure 3-1.

Module Type and Slot No.	Log. ID	Jack Type (LS, GS, DID, Tie, etc.)	Trunk No.	Pool Dial-Out Code†	Re-number To	Incoming Trunk Type (Main No., Personal Line, WATS, FX, etc.)	Telephone Number or Equipment	Label
008 MLX 01	1	GS	801			Basic GS	555-1200	1 LOCAL
	2	GS	802			Basic GS	555-1201	2 LOCAL
	3	GS	803			Basic GS	555-1202	3 LOCAL
	4	GS	804			Basic GS	555-1203	4 LOCAL
	5	GS	805			Basic GS	555-1204	5 LOCAL
	6	GS	806			Basic GS	555-1205	6 LOCAL
	7	GS	807			Basic GS	555-1206	7
	8	GS	808			Basic GS	555-1207	
008 MLX 02	9	GS	809			Basic GS	555-1208	
	10	GS	810			Basic GS	555-12	
	11	GS	811			Basic GS	555	
	12	GS	812			Basic GS		
	13	GS	813			Basic		
	14	GS	814					
	15	GS	815					
	16	GS	816					

Figure 3-1. Partially Completed Form 2c, System Numbering—Trunk Jacks

If the system has auxiliary equipment (for example, Music-on-Hold or Loudspeaker Page), continue to the next section. Otherwise, skip to the following section, "Selecting Trunk Options."

Jacks for Auxiliary Equipment

Use these instructions only if the system has auxiliary equipment: Music-on-Hold, Loudspeaker Paging, or Maintenance Alarm. Otherwise, skip to the next section, “Function information.”

Auxiliary equipment can be connected only on loop-start (LS) or ground-start/loop-start (GS/LS) jack types. You cannot use a trunk jack on an 800 DID, 100D, or 400EM module for auxiliary equipment.

To make it easier to add incoming trunks in the future, use the last trunk jack(s) on the right-most module with either LS or GS/LS trunk jacks to connect auxiliary equipment.

Planning Form Instructions

1. Review the Floor Plan and Equipment List (if available) to confirm the auxiliary equipment to be connected.
2. At the top of Form 2c, fill in the trunk numbers for each type of auxiliary equipment planned:
 - Next to “Music-on-Hold,” write the trunk number of the trunk jack designated for this equipment, and identify the music source (tape player, radio, stereo system, or Music-on-Hold) on the line provided.

NOTE:

If the system uses equipment that rebroadcasts music or other copyrighted materials, the customer 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 they can purchase a Magic On Hold® system, which does not require such a license, from their AT&T sales representative or an authorized dealer.

- Next to “Loudspeaker Page,” write the trunk numbers—maximum of 3—of the trunk jack(s) designated for the paging equipment.
- Next to “Maintenance Alarm,” write the trunk number of the trunk jack designated for the Maintenance Alarm external alert.

NOTE:

The last item, “Loop-Start Reliable Disconnect,” refers to a trunk option and will be completed later in this chapter.

Function Information

If the system has AUDIX Voice Power/FAX Attendant System, you can use the “Function” column to indicate which service will be available for those jacks. You can also use this column to indicate if a jack has a personal line and, therefore, an owner.

Planning Form Instructions

In the “Function” column of Form 2c, do *one* of the following:

- If a jack is used for a special purpose, note the purpose. For example, if the system has AUDIX Voice Power/FAX Attendant System, indicate the service by writing *one* of the following for the appropriate jack:
 - For Automated Attendant, write **AA**.
 - For Call Answer, write **CA**.
 - For Information Service, write **IS**.
 - For Message Drop, write **MD**.
 - For Voice Mail, write **VM**.
 - For Fax Response, write **FR**.

- If a jack is used for a personal line, write the extension number of the telephone.

Proceed to the next section, “Selecting Trunk Options.”

Selecting Trunk Options

The following options can be selected for the incoming trunks connected to the system:

- Loop-Start Reliable Disconnect
- Outmode Signaling
- Toll Prefix Dialing Requirements (Toll Type)
- Hold Disconnect Interval
- QCC Operator to Receive Calls (Hybrid/PBX mode only)
- QCC Queue Priority (Hybrid/PBX mode only)
- Pools
- Remote Access
- DS1 Connectivity
- Tie Trunks
- DID trunks

The first seven options (up to and including Pools) are recorded on Form 2c. The options from Remote Access to the end of the list each have their own form.

This section also includes instructions for compensating for slow dial tone from the local telephone company that may occur in systems outside of the U.S.

Forms Needed:

- **System Form 2c, System Numbering—Trunk Jacks**
- **System Form 3a, Incoming Trunks—Remote Access**
- **System Form 3b, Incoming Trunks—DSI Connectivity (100D Module)**
- **System Form 3c, Incoming Trunks—Tie**
- **System Form 3d, Incoming Trunks—DID**

Loop-Start Reliable Disconnect

Disconnect signals on incoming calls on loop-start trunks are classified as one of the following:

- **reliable**— a disconnect signal is sent to the system by the local telephone company shortly after a caller hangs up. Loop-start trunks must be reliable for trunk-to-trunk transfer. Also, reliable disconnect allows some features to function better—for example, Remote Call Forward, remote call transfers, and voice messaging systems such as MERLIN MAIL Voice Messaging System.

NOTE:

If the local telephone company uses a short Hold Disconnect interval, do **not** specify a reliable disconnect signal. Also, to ensure proper operation of AUDIX Voice Power, the system must have Ground-Start trunks or Loop-Start trunks with reliable disconnect.

- **unreliable**— a disconnect signal is *not* sent by the local telephone company on every call.

Since the disconnect signal on most loop-start trunks is unreliable, the factory setting for the disconnect signal is “unreliable.”

Before you change the setting, check with the telephone company to determine whether the disconnect signals for the loop-start trunks are reliable and to obtain the length of the Hold Disconnect interval.

If “reliable “ is selected, the interval after which the trunk is released can be set as described in “Hold Disconnect Interval” later in this section.

Planning Form Instructions

At the top of Form 2c, under the "Loop-Start Reliable Disconnect" heading, choose one of the following:

- If the loop-start trunks have an unreliable disconnect signal, check "No" (the default).
- If the loop-start trunks have a reliable disconnect signal, check "Yes."

NOTE:

If the system has AUDIX Voice Power/FAX Attendant System, Integrated Administration will automatically set Loop-Start Reliable Disconnect to "Yes."

Outmode Signaling

The system is factory set to generate touch-tone signals when users dial outside calls. Identify any rotary dial trunks that are connected to the system so that rotary dial signals can be used for these trunks.

NOTE:

Touch-tone, single-line telephone users cannot make calls using rotary dial trunks.

Check with the local or long-distance telephone company to determine which, if any, trunks connected to the system are rotary dial trunks.

Planning Form Instructions

In the "Outmode Signaling" column on Form 2c, do *one* of the following:

- For touch-tone trunks (factory setting), put a check in the "TT" column.
- For rotary dial trunks, put a check in the "R" column,

Toll Type Prefix Required

Toll Type allows the system to classify calls as either local or toll, based on the number dialed by the user. Normally, people have to dial a toll prefix (1 or 0) before dialing the area code and telephone number for a toll call. In some areas this is not necessary; dialing a prefix depends on local telephone company requirements and the type of trunk used.

Find out from the local telephone company which trunks require a toll prefix. This information is used by the system when a toll call is placed by a telephone or data terminal on ground-start or loop-start trunks.

NOTE:

Setting this option correctly does **not** allow reliable toll restriction on telephone company trunks that do not require 1 or 0 for toll calls. Also, the Toll Type feature does **not** apply to tie trunks.

Planning Form Instructions

In the “Toll Type Prefix Required for LD” column on Form 2c, check “Yes” next to any trunks on which people do not need to dial a prefix when placing toll calls.

Hold Disconnect Interval

This option allows you to set the number of milliseconds (mns) before the trunk is released when a caller on hold hangs up and abandons the call. Local telephone companies use either a long (450 ms) or short (50 ms) interval. The factory setting for the system is the long interval since it is the interval used by most telephone companies.

Check with the local telephone company for the disconnect interval used.

If the local telephone company uses the short interval, you must change the factory setting. If you don't change the setting, when a caller waiting on hold hangs up, the trunk is not released.

Planning Form Instructions

In the “Hold Disconnect Interval” column on Form 2c, do *one* of the following:

- To change to a short Hold Disconnect interval (50ms), put a check in the “Short” column.
- To keep the factory setting of a long Hold Disconnect interval (450ms), put a check in the “Long” column.

NOTE:

If the local telephone company uses a short Hold Disconnect interval, be sure you have checked “No” for “Loop-Start Reliable Disconnect” (as described earlier in this section).

QCC Operator to Receive Calls (Hybrid/PBX Mode Only)

Use these instructions only if the system has one or more QCCs. Otherwise, skip to “Remote Access.”

Assigning the QCC operator to receive calls on a trunk determines 1) if incoming calls on the trunk ring into the QCC queue and 2) which QCC operator position answers the calls.

NOTE:

If an operator presses the Backup On button on the console, any incoming calls are directed to other operator positions (regardless of whether they normally receive such calls) or to the programmed backup extension number. For more information, see “Position Busy Backup” in the “Queued Call Console” section of Chapter 4.

Planning Form Instructions

For each ground- start, loop-start, and automatic-in tie trunk on Form 2c, write *one* of the following in the “QCC Operator to Receive Calls” column:

- If you do not want the calls received on the trunk to ring into the QCC queue, write **No** (factory setting).
- If you want all QCC operators to receive incoming calls on a trunk, write **All**.
- If you want to specify one or more QCC operators to receive incoming calls on a trunk, write any combination of the extension numbers for up to four operator positions.

If you wrote **All** or specified extension numbers in this procedure, then proceed to the next section, “QCC Queue Priority Level.” Otherwise, skip to the following section, “Pools”.

QCC Queue Priority Level

Use these instructions only if you assigned one or more trunks to ring into the QCC queue, that is, you entered “All” or a specific operator extension numbers for a trunk in the previous procedure. Otherwise, skip to the next section, “Pools.”

The QCC queue priority determines the order in which calls on each trunk are sent to QCC operator positions. You set the priority for each individual trunk.

Considerations to be used in deciding the priority level are discussed in the description of Queued Call Console in *Feature Reference*.

NOTE:

Since incoming calls on DID and non-automatic dial-in tie trunks route to specific extension numbers, you cannot assign a QCC queue priority for these types of trunks.

Planning Form Instructions

On Form 2c, for each trunk with “All” or an extension number in the “QCC Operator to Receive Calls” column, write the priority level (1 to 7) in the “QCC Queue Priority Level” column for each trunk used for incoming calls, (A value of 1 indicates the highest priority; a value of 7 indicates the lowest. The factory-set priority for calls received on all trunks programmed to ring in the queue is 4.)

Pools (Hybrid/PBX Mode Only)

The system can have up to 11 pools with factory-set pool dial-out codes of 70 and 890 through 899. When the system is set up, the pool assignments are made automatically (see *Feature Reference*). If you want any of these types grouped in a pool, you must manually assign each trunk to the pool of your choice using the instructions in this section.

Decide whether to change the pool dial-out codes. The same considerations apply as those used for reassigning station extension numbers.

Forms Needed:

- **System Form 2c, System Numbering—Trunk Jacks**
- **System Form 2d, System Numbering—Special Renumbers**

Planning Form Instructions

1. Determine which trunks to group into pools using the following guidelines:
 - Each pool should contain trunks of the same type (basic, WATS, FX, tie). Ground-start and loop-start trunks of the same type (for example, WATS or FX) can be mixed in the same pool.
 - Do not mix different bands of WATS or FX trunks to different cities or include both inbound-only or outbound-only trunks within a pool. DID trunks and/or trunks used for auxiliary equipment cannot be grouped in pools. If you plan to assign Pool buttons on telephones, do not group dial-in-only tie trunks in pools.
 - In typical pooled systems, all the trunks are grouped in pools except those mentioned previously, single special-purpose trunks, and any basic trunks that are needed as personal lines assigned to a button on a telephone.

- Group the trunks for the main pool first. This should be the trunks used most often (usually the basic trunks). (If your system includes ground-start basic trunks, reassign them from the dial 890 extension pool to the main pool.) Once these trunks are assigned to the main pool, decide how to arrange the rest of the trunks in the remaining pools.
2. Indicate the pool dial-out code in the “Pool Dial-Out Code” column by doing *one* of the following:
 - To keep the factory set pool dial-out code, write the code.
 - To change the factory-set pool dial-out code:
 - a. Write the new number in the “Renumber To” column.
 - b. On Form 2d, System Numbering—Special Renumbers, write the new number in the “Renumber To” column of the “Pools” section of the form.
 3. On Form 2c, use the “Function” column to identify different bands (calling area) of WATS trunks and different destinations for FX trunks.
- Proceed to the next section, “Remote Access.”

Remote Access



CAUTION:

The Remote Access feature of your system, if you choose to use 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 properly 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 minimize 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.*

Use these instructions only if remote users need access to the system. Otherwise, skip to the next section, "DS1 Connectivity."

Remote Access allows people to use the system from a remote location. It also allows remote system programming and maintenance by a qualified technician.

You can assign Remote Access to any incoming trunk connected to the system except DID and dial-in tie trunks. (For DID and dial-in tie trunks, Remote Access is achieved by dialing the factory-set Remote Access code, 889.)

NOTE:

If you want to allow Remote Access on DID trunks, one of the telephone numbers assigned by the telephone company must match the Remote Access code, 889.

This section contains instructions for designating trunks for Remote Access, changing access numbers, whether the access is to be shared or dedicated, assigning barrier codes and class of restriction for security, access to the Automatic Callback feature, and renumbering the Remote Access code from the factory setting. For detailed information about these options, see *Feature Reference*.

You may want to begin by assigning Remote Access to only a few trunks and increasing the number later if more are needed.

NOTE:

See “System Numbering” in Chapter 2. Review the numbers available in the numbering plan you have selected.

Forms Needed:

- **System Form 1, System Planning**
- **System Form 2d, System Numbering—Special Renumbers**
- **System Form 3a, Incoming Trunks—Remote Access**

Planning Form Instructions

1. Check the Control Unit Diagram on Form 1 to verify that one or more of the following types of modules are present before you begin planning Remote Access: 400, 400 GS/LS/TTR, 008 OPT, 800 DID (Hybrid/PBX mode only), or 012 modules.
2. Under the “DID and Tie Trunks” heading at the top of Form 3a, Incoming Trunks—Remote Access, do *one* of the following:
 - To keep the factory-set access code, check “Remote Access Code: 889” and proceed to Step 3.
 - To change the factory-set access code:
 - a. Check “Renumber To” and write the new number on the line provided.
 - b. On Form 2d, System Numbering—Special Renumbers, write the new number in the “Renumber To” column of the “Remote Access Code” section at the bottom of the form. Proceed to Step 3.
3. Under the heading “Automatic Callback” at the top of Form 3a, check *one* of the following:
 - If you do not want remote callers to use the Automatic Callback feature, check “Disable” (factory setting).
 - To allow remote callers to use this feature, check “Enable.”

4. Under the heading “Barrier Codes for DID or Tie Trunks,” check *one* of the following:
 - If you plan to assign barrier codes to these trunks, check “Yes.”
 - If no barrier codes are planned for these trunks, check “No.”
5. Under the heading “Barrier Codes for Non-Tie Trunks,” check *one* of the following:
 - If you plan to assign barrier codes, check “Yes.”
 - If no barrier codes are planned for these trunks, check “No.”
6. For all trunks to which you are assigning Remote Access:

NOTE:

Remote Access should **not** be assigned to trunks and tie trunks that are used for incoming customer calls.

- a. Transfer the information from Form 2c, System Numbering—Trunk Jacks to Form 3a:
 1. Write the logical ID and trunk number in the applicable columns.
 2. Check either the “DID or Tie Trunk” or “Non-Tie Trunk” column.
 3. Complete the “Trunk Type and Description” column. Include the different bands (calling areas) of WATS trunks and different destinations for FX trunks.
 - b. For each trunk, check the “Dedicated” column (to indicate dedicated access, that is, always used for Remote Access) or the “Shared” column (to indicate shared access, that is, used for Remote Access when the system is in “Night” mode)
7. For “Class of Restriction without Barrier Codes” on page 3 of Form 3a, complete the “DID and Tie Trunks” and “Non-Tie Trunks” sections as follows:
 - a. For “Restriction,” check *one* of the following: “Unrestricted,” “Outward Restrict” (to keep the factory setting), or “Toll Restrict.”
 - b. Under the “Allowed List Access” and “Disallowed List Access” headings, check the boxes if you plan to assign these lists.

NOTE:

The ARS Restriction Level and Allowed and Disallowed List numbers will be filled in later.

8. For “Class of Restriction with Barrier Codes” on page 4 of Form 3a, do the following for each barrier code:

NOTE:

Page 4 of Form 3a holds programming information for four barrier codes. If more barrier codes are planned, make the appropriate number of copies of Form 3a. A maximum of 16 barrier codes is allowed.

- a. Write the barrier code number in the space provided, numbering them sequentially beginning with 1.
- b. Write the 4-digit barrier code in the “Digits” space.

NOTE:

For the sake of security, you may want to consider not recording the code.

- c. For “Restriction,” check *one* of the following: “Unrestricted,” “Outward Restrict” (to keep the factory setting), or “Toll Restrict.”
- d. Under the “Allowed List Access” and “Disallowed List Access” headings, check the boxes if you plan to assign these lists.

NOTE:

The ARS Restriction Level and Allowed and Disallowed List numbers will be filled in later.

Proceed to the next section, “DS1 Connectivity (100D Module).”

DS1 Connectivity (100D Module)

Use these instructions only if the system has a 100D module. Otherwise, skip to “Tie Trunks.”

DS1 connectivity involves the transmission of digital signals in the DS1 format. The interface that enables the system to allow DS1 connections is the 100D module. The system can have up to three 100D modules. Each 100D module supports up to 24 logical endpoints (IDs) or ports (one for each channel), even though the module has only one jack.

The 100D module can be configured to operate with either of the following types of service:

- **T1** (the factory setting)—to transmit and receive voice and analog data
- **PRI** —to transmit and receive voice, analog, and digital data

To ensure that both ends of the DS1 connection “speak the same language,” the following options should be set for both types of service:

- Type of Service
- Frame Format
- Suppression (Line Code)
- Signaling Mode
- Line Compensation
- Clock Synchronization
- Channel Service Unit (CSU) setting

Additional settings must be entered for both services, especially for PRI. Appropriate settings are determined by the transmission facility to which the module is connected and/or is supplied by the service provider.

This section contains instructions for both T1 and PRI services.

Because of the complexity of DS1 connectivity planning, it is strongly recommended that you review the information in *Equipment and Operations Reference* before you begin this section and as you work through these instructions.

Forms Needed:

- **System Form 1, System Planning**
- **System Form 2c, System Numbering—Trunk Jacks**
- **System Form 3b, Incoming Trunks—DS1 Connectivity (100D Module)**

Planning Form Instructions

On Form 2c, System Numbering—Trunk Jacks:

1. For all trunks listed as “PRI” in the “Jack Type” column:
 - a. Write the kind of service to be connected to each channel in the “Incoming Trunk Type” column.

NOTE:

You **cannot** use the 24th channel for services.

b. Write **unequipped** in the “Incoming Trunk Type” column for any channel not used at this time.

2. For all trunks listed as “T1-Tie” that do not show “unequipped” in the “Incoming Trunk Type” column, write the kind of service connected to each channel in the “Incoming Trunk Type” column.

NOTE:

If the signaling type is common-channel, you cannot use the 24th channel and program the module for tie-trunk emulation. PRI is always common channel signaling.

3. Do *one* of the following:

- To select settings for T1, continue to the next section, “T1 Service.”
- To select settings for PRI, skip to “PRI Service.”

T1 Service

Use these instructions only if one or more of the 100D modules in the system will be set up for T1. If the 100D module(s) will be set up for PRI, skip to the next section, “PRI Service.”

T1 service allows the emulation of different analog lines. You can also order services, for example, Megacom 800, over the channels. The capacity, however, is limited to voice calls and analog data calls via a modem.

Planning Form Instructions

On page 1 of Form 3b, Incoming Trunks—DS1 Connectivity (100D Module), for each 100D module in the system:

1. Next to “Slot No.,” write the number of the control unit slot that contains the module. (Refer to the “Control Unit Diagram” on Form 1.)

NOTE:

If more than one 100D module is used, complete the first box, “Module 1,” to show the options assigned to the 100D module in the lowest number control unit slot. Use the second box for the second lowest number slot, and the last box for the highest number slot.

2. Under “Type of Service,” check “T1” (the factory-setting).

NOTE:

When programming, the default of "T1" is **not** automatically selected if nothing is entered. It must be manually entered and subsequent information entered on additional screens.

3. In the table under the "T1 Trunks" heading, write the channel number(s) for each trunk type and/or, for TIE or All TIE, check "TIE-PBX" or "Toll."
4. Under the "Frame Format" heading, do *one* of the following:
 - To retain the factory setting, check "D4 Compatible."
 - To change the factory setting, check "Extended Super Frame (ESF)."
5. Under the "Suppression (Line Code)" heading, do *one* of the following:
 - To retain the factory setting, check "AMI-ZCS."
 - To change the factory setting, check "B8ZS."
6. Under the "Signaling Mode" heading, for all boxes that describe T1 modules, do *one* of the following:
 - To retain the factory setting of robbed-bit signaling, check "Robbed Bit Signaling (RBS)."
 - To change the factory setting to common-channel signaling, check "Common Channel Signaling (CCS)."
7. Under the "Line Compensation" heading:
 - a. Fill in the approximate distance (number of cable feet) between the 100D module and its CSU or other far-end connection next to "Cable Feet."
 - b. Use Table 3-3 to select the line compensation setting needed. (The factory setting is a value of 1.)

Table 3-3. Line Compensation Settings (Based on 22-Gauge Cable)

<u>Setting</u>	<u>dB LOSS</u>	<u>Cable Feet</u>
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

* Factory Setting

8. Under "Priority" in the "Clock Synchronization" section, do *one* of the following:
 - If installing only one 100D module:
 - To keep the factory setting, check "Primary." (This module provides synchronization for the system.)
 - If the synchronization source is other than through the 100D module, check "None." Proceed to Step 9.
 - If installing more than one 100D module, decide which module, if any, provides the primary synchronization:
 - If Module 1 provides clock synchronization, check "Primary" in the first box (the factory setting).
 - If Module 2 (or Module 3) provides clock synchronization, check "Primary" in the box that describes that 100D module.
 - If the synchronization source is other than through a 100D module, check "None."
 9. If assigning backup synchronization:
 - a. Check "Secondary" in the box that describes the 100D module providing secondary synchronization.
 - b. Check "Tertiary" in the box that describes the 100D module providing tertiary backup.
 10. Under the "Source" subheading in each box, do *one* of the following:
 - To retain the factory setting, check "Loop." (The system uses the clock of the far-end connection.)
 - To change the setting, check "Local. " (The clock is free-running.)
 11. Under the "Activation" subheading in each box, do *one* of the following:
 - If loop clock synchronization is taking place, check "Active." (factory setting)
 - If the clock is free-running, check "Not Active."
- NOTE:**
Normally, the primary synchronization source is set to "Active" and other modules are set to "Not Active."
12. If the 100D module type of service is T1 and Incoming Ground Start or Loop Start trunks are to be emulated, then record the CSU setting under the "Channel Service Unit" heading by doing *one* of the following in all columns that describe T1 modules used for trunk emulation:

- To retain the factory setting, check “Foreign Exchange.”
- To change the factory setting, check “Special Access.”

To set up a 100D module for PRI service, proceed to the next section, “PRI Service.”

PRI Service

Use these instructions only if the type of service on the 100D module will be is PRI. Otherwise, skip to the next section, “Tie Trunks.”

PRI is a standard access arrangement for ISDN service that may be used to connect the system to another switch over a T1 trunk.

This section contains instructions for recording decisions about the following options for each PRI facility:

- B-channel groups
- PRI services (incoming and outgoing) according to B-channel group
- Line Appearance Routing (incoming services)
- Dial Plan Routing (incoming services; Hybrid/PBX mode only)
- Outgoing Tables (Network Selection Table, Special Services Table, and Call-by-Call Service Table)
- Telephone Number to Send (SID-ANI information)
- Test Telephone Number
- Timers and Counters
- Terminal Equipment Identifier

NOTE:

Before entering PRI information during system programming, the “PRI” type of service must have been selected already as described in the procedure in this section.

For detailed information, see *Equipment and Operations Reference*.

Because of the complexity of the timer, counter, and terminal equipment identifier information, the factory settings for them should rarely be changed. Incorrect settings can have an adverse affect on the operation of PRI facilities.

Forms Needed:

■ System Form 3b, Incoming Trunks—DSI Connectivity (100D Module)

NOTE:

If there is more than one 100D module setup for PRI service or you have more than eight B-channel groups assigned to a module, make copies of page 4 of the form as necessary.

■ Form 2c, System Numbering—Trunk Jacks

Planning Form Instructions

On page 1 of Form 3b, Incoming Trunks—DSI Connectivity (100D Module), for each 100D module with PRI service:

1. Next to “Slot No.,” write the number of the control unit slot that contains the module. (Refer to the “Control Unit Diagram” on Form 1.)

NOTE:

If more than one 100D module is used, complete the first box, “Module 1,” to show the options assigned to the 100D module in the lowest number control unit slot, Use the second box for the second lowest number slot, and the last box for the highest number slot.

2. Under “Type of Service,” check “PRI.”

NOTE:

During programming, PRI must be selected here **before** the PRI options information is entered. When it is selected, the system will restart.

3. Under the “Frame Format” heading, change the factory setting by checking “Extended Super Frame (ESF).”
4. Under the “Suppression (Line Code)” heading, change the factory setting by checking “B8ZS.”
5. Under the “Signaling Mode” heading, check Common Channel Signaling (CCS).

NOTE:

The signaling mode setting does not apply to PRI, Common Channel Signaling (CCS) is automatically assigned when PRI is selected. Also, the 24th channel cannot be used for voice or data transmissions.

6. Under the “Line Compensation” heading:
 - a. Fill in the approximate distance (number of cable feet) between the 100D module and its CSU or other far-end connection next to “Cable Feet.”
 - b. Use Table 3-4 to select the line compensation setting needed. (The factory setting is a value of 1.)

Table 3-4. Line Compensation Settings (Based on 22-Gauge Cable)

Setting	dB Loss	Cable Feet
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

* Factory Setting

7. Under “Priority” in the “Clock Synchronization” section, do *one* of the following:
 - If installing only one 100D module:
 - To keep the factory setting, check “Primary.” (This module provides synchronization for the system.)
 - If the synchronization source is other than through the 100D module, check “None.” Proceed to Step 8.
 - If installing more than one 100D module, decide which module, if any, provides the primary synchronization:
 - If Module 1 provides clock synchronization, check “Primary” in the first box (the factory setting).
 - If Module 2 (or Module 3) provides clock synchronization, check “Primary” in the box that describes that 100D module.
 - If the synchronization source is other than through a 100D module, check “None.”
8. If assigning backup synchronization:
 - a. Check “Secondary” in the box that describes the 100D module providing secondary synchronization.
 - b. Check “Tertiary” in the box that describes the 100D module providing tertiary backup.

9. Under the "Source" subheading in each column, do *one* of the following:
 - To retain the factory setting (the system uses the clock of the far-end connection), check "Loop."
 - To change the setting (the clock is free-running), check "Local."
10. Under the "Activation" subheading in each box, do *one* of the following:
 - If loop clock synchronization is taking place, check "Active." (factory setting)
 - If the clock is free-running, check "Not Active."

NOTE:

Normally, the primary synchronization source is set to "Active" and other modules are set to "Not Active."

11. Under the "Channel Service Unit" heading, check "Foreign Exchange."
12. To assign B channels to groups, determine which channels to group and then record each group on Form 3b, page 3, under the "B-Channel Groups" heading:

NOTE:

All channels assigned to a group must be on the same 100D module. Also, the order of the B-channel groups is not important. However, it is recommended that the order in which channels are assigned within a group should be the exact opposite of the order in which the telephone company's switch hunts through for a channel. Consult with the service provider to determine what the correct order should be.

- a. Write the group number (1-80) under the "B-Channel Group No. " heading (start with 1 and number sequentially),
- b. Write the slot and port number of each B channel assigned to the group. (Refer to Form 2c, System Numbering—Trunk Jacks.)

When programmed for PRI, the single DS1 jack on the 100D module supports 23 channels, or ports. (The 24th channel transmits signaling mode information.) To determine the port number, assume that port 1 is at the bottom of the module to which you are assigning B channels.

- c. For all channels you plan to associate with the group, write the trunk number, (Refer to Form 2c, System Numbering—Trunk Jacks).

13. To assign services to each B-channel group, complete page 4:

NOTE:

If there is more than one 100D module setup for PRI service or you have more than eight B-channel groups assigned to a module, make copies of page 4 as necessary.

- a. Under the "B-Channel Group No." heading, copy the B-channel group numbers from page 3.
- b. Write the services to be Associated with each group under the "Outgoing Services" and "Incoming Services" headings. Select from the following services:
 - n AT&T Toll: Megacom WATS, Megacom 800, ACCUNET SDS, Software Defined Network (SDN), MultiQuest, Long Distance.
 - n Local: Out WATS, 56/64 Digital, Virtual Private Network, INWATS.
 - n Other: Call-by Call, Other.

NOTE:

A B-channel group may have outgoing services only, incoming services only, or both. Also, if the B-channel group is Call-by-Call, then the incoming service can be any one of the subscribed services for the B-channel group.

- c. If the group has incoming services assigned, do *one* of the following:
 - If the routing will be by Dial Plan Routing (Hybrid/PBX mode only), check "Dial Plan Routing."
 - If the routing will be by line appearance, check "Line Appearance Routing."

14. For all B-channel groups which are administered to route calls by line appearance, you need to assign "a telephone number to each line in the B-channel group to allow the system to route calls by line appearance. Record information on page 5:

- a. Write the B-Channel Group No. and the trunk no(s). from page 3.
- b. Write the unique inbound routing telephone number (the "directory number" of up to 12 digits) furnished by the PRI service provider in the "Telephone Number" column.

NOTE:

The factory setting is that no telephone number is assigned. The telephone you assign should be the number sent to the system by the network. The number should also be unique within the same B-channel group and must be different from the associated test telephone number. (Test telephone numbers are assigned later in this procedure.)

15. For all B-channel groups you plan to assign routing by Dial Plan Routing, you must administer the Dial Plan Routing table to direct the system to properly route calls to dialplan endpoints. Record table entries (maximum: 16 entries) on page 6:

- a. For "Service," write *one* of the following:

- AT&T Toll: Megacom WATS, Megacom 800, ACCUNET SDS, SDN, MultiQuest, Long Distance.
- Local: Out WATS, 56/64 Digital, Virtual Private Network, INWATS.
- Other: All services, Other, No Service.

NOTE:

A service must be entered in this field for the entry to be activated.

- b. For "Pattern to Match," write the exact pattern to match (refer to the service provider). If nothing is entered, it matches any pattern.
- c. For "Total Digits in dialed number," write the total number of digits (0-14) expected in the dialed number; 0=wildcard, that is, match any number. (Refer to the service provider for the appropriate number,)
- d. After the match has been made, do *one* of the following to enable the system to determine where to direct the call:
- To delete digits, write the number of digits (0-14) to delete. (The system deletes from the first digit onward.)
 - To add digits, write the exact digits to enter (0-4), for example, 7128. The default is blank. (The system adds the digits to the beginning of the number.)

16. In the Network Selection Table of the outgoing tables on page 7, the digit pattern represents the dial code for specifying a long distance common carrier; the asterisks represent the digits in the common carrier identification. If the telephone company has directed you to change this information, obtain the correct entry from them. (But note that the digit pattern must come first.) Entry 1 represents current national standards for specifying long distance carriers (asterisks represent the common carrier code wildcard so that anything will match). Entry 0 represents the

coming national standards. The remaining entries are reserved for other future use.

NOTE:

The Network Selection Table and the Special Services Table contain defaults that reflect U.S. standards for public telephone network access. These defaults can be modified to conform to other standards. However, it is not recommended that you change them unless you are explicitly instructed by the telephone company.

17. In the Special Services Table:

- a. For "Pattern to Match," write the exact digit pattern to match. (No wildcards are permitted.)
- b. For "Operator," indicate Local Operator (OP), Presubscribed Operator (P), or No Operator service (None) associated with the pattern.
- c. For "Type of No.," indicate whether the pattern is for calling International (I) or National (N).
- d. To delete digits, write the number of digits (0-4) to delete.

18. For all Call-by-Call B-channel groups, to route all outgoing calls over a Call-by-Call B-channel group, you must administer the Call-by-Call Service Table to direct the system to properly route calls. Record table entries (maximum: 10) on page 8:

- a. For "Pattern to Match," write the digit pattern to match (up to 8 digits). (Refer to the service provider. No wildcards are permitted.)
- b. For "Call Type," indicate the type(s) of calls that will be associated with the pattern by doing *one* of the following:
 - If all outgoing calls will be voice calls (for example, Megacom WATS), write **Voice**.
 - If all outgoing calls will be data only (for example, ACCUNET), write **Data**.
 - If outgoing calls may be either voice or data (for example, SON), write **Both**.

NOTE:

If you indicate "Both," make sure the service can support both voice and data calls.

c. For "Service," write *one* of the following:

- AT&T Toll: Megacom WATS, ACCUNET SDS, SDN, Long Distance.
- Local: Out WATS, 56/65 Digital, Virtual Private Network.
- Other: Other, No Service.

d. If the system will need to delete digits, write the number of digits (0-8) to delete. (The system deletes from the first digit onward.) For more information, check with the service provider,

19. On page 9, assign the telephone number sent to the network for outgoing PRI calls by identifying the trunk number and writing the 12-digit telephone number that identifies the company as the caller in the "Telephone Number to Send" column.

NOTE:

The factory setting is that no telephone number to send is assigned. If you assign a number, it does **not** have to be unique. Also, the availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or central office equipment.

20. If available, assign a test telephone number that is used for maintenance by the service provider. For each 100D module with an PRI service type, write the 12-digit test telephone number used for maintenance next to the "Test Telephone Number" heading on Page 10. Assign one for each 100D module.

NOTE:

The factory setting is that a test telephone number is not assigned. The number you assign must be the same number as that furnished by the PRI service provider. When you assign a test telephone number, it must be different from the numbers assigned to other channels assigned to the same B-channel group.

21. Under the "Timers and Counters" heading, do *one* of the following:

- To keep the factory setting, leave the "Change To" column blank.
- To change the factory setting for any timer or counter, write the new threshold on the appropriate line in the "Change To" column.

22. Under the "Terminal Equipment Identifier (TEI)" heading, do *one* of the following:

- To keep the factory-set TEI, check "0."
- To change the factory-set TEI from 0 , write a value from 1 to 63 in the space provided.

NOTE:

If the system includes DS1 connectivity, all local offerings of DS1 configurations must be reviewed by AT&T National Technical Marketing (NTM) personnel to ensure compatibility. For more information, see Appendix C, "T1/PRI Review." Also, information required by the facilities vendor is discussed in Appendix D, "DS1 Ordering Information."

Tie Trunks

Use these instructions only if the system has tie trunks, including tie trunks emulated through a DS1 connection. Otherwise, skip to the next section, "DID Trunks."

Tie trunks must be configured to match central office requirements or the configuration of the system to which they tie. Review tie trunk operation and make the following decisions about the way each tie trunk operates:

- Direction
- Signaling Type
- Dial Mode
- Dial Tone
- Answer Supervision Time
- Disconnect Time

This section contains instructions for each of these options. For detailed information about DID trunks, see *Equipment and Operations Reference*.

Forms Needed:

- **System Form 2c, System Numbering—Trunk Jacks**
- **System Form 3c, Incoming Trunks—Tie**

Planning Form Instructions

1. Transfer the trunk identification from Form 2c, System Numbering—Trunk Jacks, to Form 3c. Write the logical ID and trunk number for each tie trunk connected to the system.

2. Under the "Direction" heading on Form 3c, check the direction for each tie trunk next to its trunk number:
 - If the tie trunk is two-way, check the factory-set "Two-Way" column.
 - If the trunk is one-way, check either "Outgoing" or "Incoming."
3. Under the "Signaling Type (Intype/Outtype)" heading check either "In" or "Out" under "Wink," "Delay," "Immediate," or "Automatic" for each tie trunk.

NOTE:

Choose the same type as that used by the system to which you are connecting. For incoming-only or two-way tie trunks, the incoming type must be the same as the outgoing type of the remote system. For outgoing only or two-way tie trunks, the outgoing type must be the same as the incoming type of the remote system.

Wink is the factory setting and, if available, is the preferred type, followed by delay and then immediate.

Immediate does not work with the touch-tone dial mode.

For T1 facilities used for services (for example, Megacom), consider the direction of the tie trunk and how trunk assignments will be made and select from the following:

- **One-way, outgoing tie trunks** - All outgoing calls are placed using Automatic Route Selection and tie trunks are not assigned to Personal Line or Pool buttons on telephones. Select wink signaling.
 - **One-way, outgoing tie trunks** - Tie trunks are assigned to Personal Line or Pool buttons on telephones. Select immediate signaling.
 - **One-way, Incoming tie trunks** - Dialed Number Identification Service (DNIS) is included. Select wink signaling.
 - **One-way, Incoming tie trunks** - DNIS is not included. Select automatic signaling.
4. Under the "E&M Signal" heading, select *one* of the following signaling types to be used on the tie trunks:
 - If the tie trunks are connected to the other system through the local telephone company, select type "1S" (the factory setting).
 - If the tie trunks are connected directly to a system that uses type 1S signaling and is located near this system, select type "1C."

NOTE:

This assumes that the two systems are connected together without any provisioned facility, and without any signaling treatment equipment.

- If the tie trunks are connected directly to a system that uses type 5 signaling and is located near this system, select type “5.”

5. To select dial mode:

- a Under the “Inmode” heading, check either “Touch-Tone” or “Rotary” (factory setting) for each incoming-only and each two-way tie trunk.

NOTE:

If you have checked “Incoming” for a tie-trunk’s direction and “immediate” for its signaling type, you cannot have touch-tone mode.

- b Under the “Outmode” heading, check either “Touch-Tone” or “Rotary” (factory setting) for each outgoing-only and each two-way tie trunk.

6. To select if the system will provide a dial tone, check *one* of the following for each tie trunk under the “Dial Tone” heading:

- To produce a dial tone, check “Remote” (factory setting).
- To have no dial tone, check “Local.”

7. For “Answer Supv. Time,” do *one* of the following:

- To keep the factory setting, check “300.”
- To change to a new value, write the new value (20-4800 ms) in the “Other” column. (Use 20-ms increments.)

8. Under the “Disconnect Time” heading, do *one* of the following:

- To keep the factory setting, check “300.”
- To change to a new value, write the new value (140-2400 ms) in the “Other” column. (Use 10-ms increments).

Proceed to the next section, “DID Trunks.”

DID Trunks (Hybrid/PBX Mode Only)

Use these instructions only if Direct Inward Dial (DID) trunks are connected to the system. Otherwise, skip to the next section, “Assigning Trunks.”



CAUTION:

DID numbers that correspond to pool dial-out codes (or facility access codes) can be used to avoid toll restriction, leading to toll abuse and/or fraud. (See “Customer Support Information” at the front of this book for more information on security.)

This section contains instructions for setting the following options for DID trunks:

- Type of DID Trunks
- Expected Digits
- Delete Digits
- Add Digits
- Signaling
- Invalid Destination
- Assign Trunks to Blocks

These options are assigned to blocks of trunks, and a maximum of two blocks is permitted.

NOTE:

If you want to allow Remote Access on DID trunks, one of the telephone numbers assigned by the telephone company must match the Remote Access dial code. The factory setting is 889.

For detailed information about DID trunks and these options, see *Equipment and Operations Reference*.

NOTE:

If two-way DID service is available from the local telephone company, it is typically set up as Tie-Trunks.

Forms and Information Needed:

- Form 3d, Incoming Trunks—DID

NOTE:

If your system will have two blocks, make a copy of Form 3d and write the block number in the "Block Number" space.

Check with the local telephone company to determine the number of digits sent.

Planning Form Instructions

1. On Form 3d, under the "Type" heading, do *one* of the following:
 - To change the type, check "Immediate-start."
 - To keep the factory setting, check "Wink-start."

2. Under the "Expected Digits" heading on Form 3d, do *one* of the following:
 - To show that the telephone company sends the factory-set number of digits, check "3."
 - To show the number of digits sent by the telephone company, check "1," "2," or "4."

3. Compare the number of digits sent by the local telephone company to the number of digits in the system numbering plan, and do *one* of the following:
 - If your numbering plan matches the number of digits sent by the telephone company, check "0" (the factory setting) under the "Delete Digits" and "Add Digits" headings.
 - If the number of digits sent by the local telephone company is **more** than the number of digits in the system numbering plan, specify that one to four digits be deleted from the telephone company digits by checking the appropriate number (1, 2, 3, or 4) under the "Delete Digits" heading.
 - If the number of digits sent by the local telephone company is **fewer** than the number of digits in the system's numbering plan, specify the specific digits (1-9999) to be added to the digits sent by checking "Add these digits" under the "Add Digits" heading and writing the specific digits to be added in the space provided.

4. Under the "Signaling" heading, do *one* of the following:
 - To keep the factory-set signal, check "Rotary."
 - To change the setting, check "Touch-tone."

NOTE:

You cannot have touch-tone if you selected immediate-start.

5. Under the “Invalid Destination” heading, do *one* of the following:

NOTE:

This setting applies to both blocks. You cannot specify a different setting for each block.

- To indicate that calls to unassigned extension numbers go to the backup position (usually the primary operator), check “Send to backup position.”
 - To indicate that calls to unassigned extension numbers should receive a fast busy signal, check “Return to fast busy.”
6. Group DID trunks into each block by assigning the DID trunks according to how incoming calls must be routed to reach the proper extension numbers, and transfer the information from Form 2c, System Numbering—Trunk Jacks to the “Trunks Included in Block” section of Form 3d. Write the logical ID, trunk number, and telephone number in the applicable columns.
7. Select the disconnect time for each DID trunk by doing *one* of the following under the “Disconnect Time” heading:
- To keep the factory setting, check “500 ms.”
 - To change the disconnect time, write the new value (10-2550) in the “Other” column.

If this system is installed outside of the U.S., continue to the next section concerning compensating for slow dial tone from the local telephone company. Otherwise, skip to the following section, “Assigning Trunks.”

Compensating for Slow Dial Tone (International Installations)

Note that if this system is being installed **outside of the U.S.**, problems can arise because of slow dial tone from the local telephone company due to the limitations of their switching equipment. If this is the case, be aware of the following:

- Users should be instructed to wait for dial tone before they dial, (Due to changes made to internal timers, the system will allow the delay.)
- The following features cannot be used:

- Automatic Route Selection
- Remote Call Forwarding
- Remote Access (outgoing)
- Tie trunks (configuration dependent)
- Delay option on rotary lines
- Autodial: Repertory Dial, Last Number Dial, Saved Number Dial, Callback queue

Also, the slow dial tone may cause problems with Transfer, Bridging, and end-to-end signaling.

- Additional Touch Tone Receiver (TTR) boards may be needed for the system. The number of TTRs can be increased by adding the 400 LS/TTR or 400 GS/LS/TTR modules, each of which provides four TTRs.

To determine the number of TTRs needed, perform a traffic study on the number of outgoing single-line set calls/busy hour, and the number of incoming calls/busy hour routed to applications such as MERLIN MAIL. Then use Table 3-5 to determine the number of TTRs required.

Table 3-5. Total Number of TTRs Required

Calls per Hr.	Dial Tone Delay					
	0 sec.	15 sec.	30 sec.	45 sec.	60 sec.	75 sec.
110	4	4	6	6	8	8
180	6	6	8	10	10	10
350	8	10	10	10	14	14
420	8	10	12	14	14	16
610	10	12	14	16	18	20
710	10	14	16	18	20	22

Assigning Trunks

This section contains instructions to assign trunks to telephones and direct-line consoles.

NOTE:

To assign trunks to data-only stations, follow the instructions in Chapter 5.

Forms Needed:

- **System Form 2a, System Numbering—Station Jacks**
- **System Form 2b, System Numbering—Digital Adjuncts**
- Telephone and Console forms: (Use the following forms as appropriate for the telephones and consoles in the system. Make one copy of the appropriate form for each extension.)
 - **System Form 4b, Analog Multiline Telephone**
 - **System Form 4d, MLX Telephone**
 - **System Form 4e, MFM Adjunct—MLX Telephone**
 - **System Form 4f, Tip/Ring Equipment**
 - **System Form 5a, Direct-Line Console (DLC)—Analog**
 - **System Form 5b, Direct-Line Console (DLC)—Digital**
 - **System Form 5c, MFM Adjunct—DLC**

Planning Form Instructions

1. On Page 1 of Forms 4b, 4d, 4e, 5a, 5b, and 5c, transfer the user identification from Form 2a, System Numbering—Station Jacks to each copy of all telephone forms:
 - a. Write the logical ID in the “Logical ID” space.
 - b. Write the extension number in the “Extension No.” space.
 - c. Write the name of the person or the location of the equipment in the “Person or Location” space.
2. For any “voice/voice” or “voice/data” entries in the “Person or Location” column of Form 2a, indicate the type of station jack pairs under the “Station Jack Pair” heading on Forms 4b and 5a by doing *one* of the following:
 - Check the “Voice Announce to Busy” box and enter the logical ID and extension number under the “Even-numbered jack” heading.

- Check the “Simultaneous Voice and Data” box and enter the logical ID and extension number under the “Even-numbered jack” heading.
3. On Forms 4e and 5c, fill in the user identification from Form 2b, System Numbering—Digital Adjuncts for any adjuncts connected to an MLX telephone using an MFM:
 - a. Write the extension number in the “Extension No.” space.
 - b. Write the name of the person or the location of the equipment in the “Person or Location” space.
 4. Identify the equipment at each station (refer to the Floor Plan):
 - a. Check the box that describes the telephone, console model, or type of tip/ring equipment.
 - b. Check the box under “Adjuncts” that describes the adjuncts at the station.

NOTE:

Checking the “Data Terminal” box is informational only.

Assigning Telephone Buttons

This section contains instructions for assigning buttons to:

- Telephones in Hybrid/PBX Mode
- Telephones in Key and Behind Switch Mode
- DLCs

Forms Needed:

System Forms 4b, 4d, 4e, 4f, 5a, 5b, and 5c

Telephones in Hybrid/PBX Mode

This section contains instructions for assigning the following seven kinds of buttons to telephones or adjuncts connected to an MLX telephone using an MFM (excluding QCC operator positions):

- **System Access Ring button**
- **System Access Voice button**

- System Access Originate Only button
- Shared System Access button
- Personal Line button
- Pool button
- Loudspeaker Page button

The system is factory set to assign certain kinds of line buttons depending on the type of equipment. For non-operator multiline telephones, the system assigns a System Access Ring, System Access Voice, and System Access Originate Only button. (See Figures 3-2 and 3-3.)

For detailed information about the telephones and their buttons, see *Equipment and Operations Reference*.

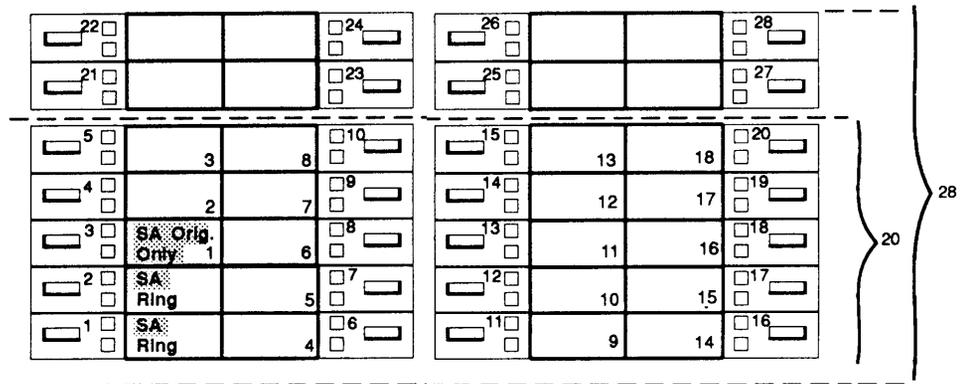


Figure 3-2. Factory-Set Assignment, MLX Telephones (Hybrid/PBX Mode)

Although equipment such as single-line telephones, answering machines, and fax machines do not have buttons, the system treats them as multiline telephones with 34 buttons.

The system assigns one System Access Ring, one System Access Voice, and one System Access Originate Only button to every adjunct connected through an MFM to an MLX telephone. For equipment connected to a 012 or 008 OPT module, the system assigns two System Access Ring buttons and one System Access Originate Only button.

Planning Form Instructions

1. Select the types of buttons to assign to each telephone using the following guidelines:

- For multiline telephone users:

- You can assign a combination of up to 10 System Access Voice, System Access Ring, System Access Originate Only, or Shared System Access buttons to each telephone. However, the default of 3 does ensure that if each user is busy on a call at least one additional button is available to receive a call and another is available to make a call. This leaves the rest of the buttons on multiline telephones free for customizing.

NOTE:

On a DLC, there are 10 System Access buttons (including System Access Originate Only), but no Shared System Access buttons. On a QCC, no buttons can be programmed.

- If you plan to use Automatic Route Selection (ARS), consider keeping the factory-set button assignments. Since ARS will pick the appropriate route, there is no need for pool buttons.
- Consider assigning Shared System Access buttons to small groups of users who need to be able to answer and distribute each other's calls easily or be able to join conversations. Each Shared System Access button you assign corresponds to a System Access Ring or System Access Voice button on another telephone. Therefore, to provide complete coverage within the group, you must be sure that each System Access Ring and System Access Voice button assigned to a telephone is also assigned to other members of the group. Each System Access Ring or System Access Voice button on a telephone can be assigned as a Shared System Access button on up to 16 other telephones.

- Assign a Pool button when a specific trunk pool (for example, WATS or FX) is used frequently. Also consider assigning Pool buttons if you do not plan to use ARS and the system includes only one or two pools.
 - Assign Personal Line buttons when an exclusive private number is needed, for example, for a company executive. Any trunk connected to the system can be used as a personal line as long as it is not in a trunk pool.
- For single-line telephones, answering machines, fax machines, or any other device connected to a 012 or 008 OPT module:
- The factory settings for System Access buttons can be changed; however, these settings should be adequate to meet most user needs since System Access buttons can be used to make and receive both inside and outside calls. Each station must have at least one System Access button.

NOTE:

Single-line telephones cannot have additional System Access or Shared System Access buttons. Also, single-line telephones connected via an 012 or 008 OPT modules cannot have System Access buttons removed from them.

- If you want the station to receive outside calls on a specific trunk, assign a Personal Line button; if you want the station to receive outside calls on a trunk included in a pool, assign a Pool button.

NOTE:

See *System Programming* for instructions.

- For adjuncts connected using an MFM, it is recommended that you change the button 2 assignment to System Access Originate Only and remove the button 3 assignment.

2. Complete the “Button Diagram” section of each copy of Forms 4b, 4d, 4e, and 4f.

NOTE:

The button diagrams for DLCs (Form 5a and Form 5b) will be completed later.

- a. On buttons 1 through 10, indicate the types of System Access buttons by circling "SA" for "SA Voice," "SA Ring," or "SA Orig Only," writing **Ring** or **Voice** for "SA Orig Only" buttons, and writing "Shared SA," "Pool," or "Personal Line," and do the following as appropriate:
 - For a Shared System Access button, include the number of the extension with the associated SA button (refer to Form 2a), and the button number on that telephone.
 - For a Pool button, include the pool's extension number. (Refer to Form 2c.)
 - For a Personal Line button, include the telephone number and, for future reference, record the trunk numbers. (Refer to Form 2c.)

- b. Assign Loudspeaker Page buttons by selecting the button and writing "Page" on it.

If the system includes one or more DLCs, proceed to "Direct-Line Consoles" later in this section. Otherwise, proceed to Chapter 4 to record feature assignments on these forms for each extension.

Telephones in Key and Behind Switch Mode

The line buttons you can assign to telephones or adjuncts-connected through an MLX telephone using an MFM are the following:

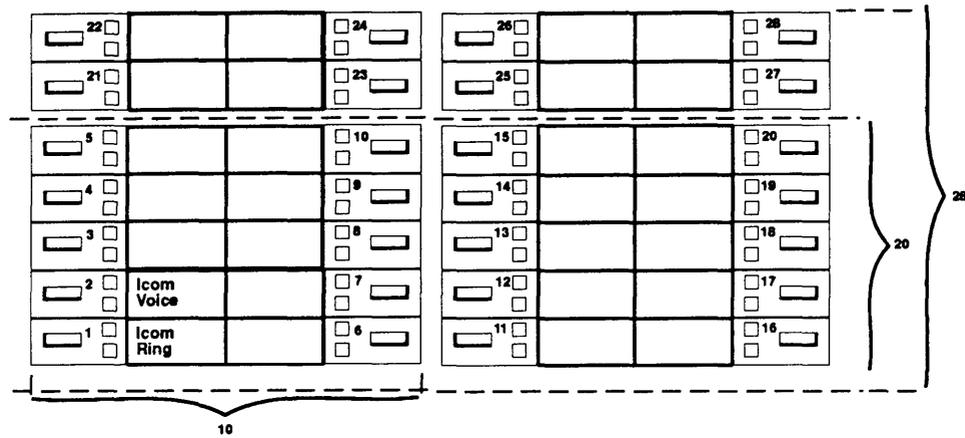
- Intercom Ring button
- Intercom Voice button
- Intercom Originate Only button
- Loudspeaker Page button
- Personal Line button (Key mode only)
- Prime Line button (Behind Switch mode only)

The system is factory set to assign certain kinds of line buttons depending on the type of equipment and the mode of operation:

- In Key mode, the system assigns an Intercom Ring button, an Intercom Voice button, and the first eight outside lines connect to the control unit to every non-operator multiline telephone.

- In the Behind Switch mode, the system assigns an Intercom Voice button, Intercom Ring button, and one Prime Line button to every non-operator multiline telephone.
- For either mode, the line assignment is the same for both analog and MLX telephones.

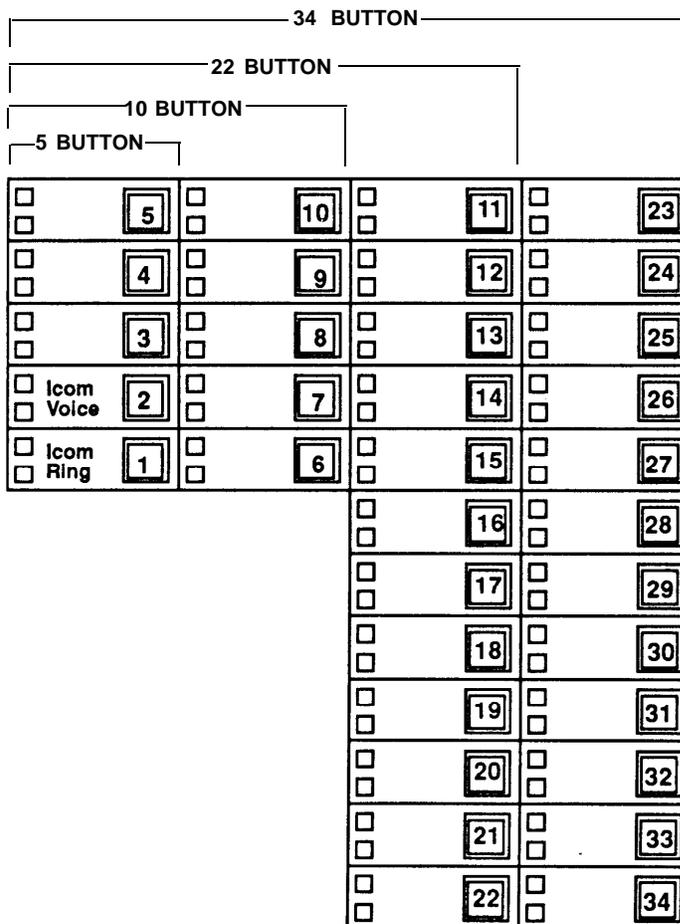
See Figures 3-4 and 3-5.



Key Mode:
Up to 8 personal line buttons are assigned beginning at button 3.

Behind Switch Mode:
One prime line button is assigned to button 3.

Figure 3-4. Factory-Set Assignment, MLX Telephones (Key and Behind Switch Mode)



Key Mode:
Up to 8 Personal line buttons are assigned beginning at button 3.

Behind Switch Mode:
One prime line button is assigned to button 3.

Figure 3-5. Factory-Set Assignment, Analog Multiline Telephones (Key and Behind Switch Mode)

Although equipment such as single-line telephones, answering machines, and fax machines do not have buttons, the system treats them as multiline telephones with 34 buttons.

In both Key and Behind Switch modes, the system assigns no outside lines to this type of equipment. The system assigns two Intercom Ring buttons to every adjunct, connected through an MFM to an MLX multiline telephone, and to equipment connected to an 012 or 008 OPT module.

Planning Form Instructions

1. Select the types of buttons to assign to each telephone using the following guidelines:

- (Key Mode) For multiline telephone users:

- You can assign a combination of up to 10 Intercom Voice, Intercom Ring, or Intercom Originate Only buttons to each extensions.
- Assign additional Intercom Ring, Intercom Voice, or an Intercom Originate Only button for people who frequently receive or make transferred calls. The Intercom Originate Only button ensures that if all Intercom buttons are busy, at least one is still available to make a call or to transfer the current call.
- Assign additional outside lines, including special-purpose lines such as WATS or FX.
- Remove or rearrange the eight factory-set outside-line assignments, if desired.
- For all types of telephones, if you want the extension user to receive outside calls on a specific line, assign a personal line to a button on the telephone or adjunct. On single-line telephones only, the extension user is automatically connected to the intercom when the receiver is lifted, and the user can select an outside line by dialing the dial-out code (usually a 9).
- Consider assigning a Loudspeaker Page button to make announcements over an optional loudspeaker connected to the control unit. To make an announcement, users press the button and speak into the handset. They do not need to dial the extension of the loudspeaker paging system.

- (Key Mode) For single-line telephone users, answering machines, fax machines, or any other device connected to a 012 or 008 OPT module or an MFM:

- You can assign a combination of up to 10 Intercom Voice, Intercom Ring, or Intercom Originate Only buttons to each extension. (At least one Intercom button must be assigned to each single-line telephone or adjunct connected to an MLX telephone using an MFM.)
- If you want the extension user to receive outside calls on a specific line, assign a personal line to a button on the telephone or adjunct. The extension user is automatically connected to the intercom when the receiver is lifted, and the user can select an outside line by dialing the dial-out code (usually a 9).

- (Behind Switch Mode) For multiline telephones, consider assigning
 - Additional lines.
 - Any outside lines connected directly to the control unit, including special-purpose lines.
 - A Loudspeaker Page button to make announcements over an optional loudspeaker connected to the control unit. To make an announcement, users press the button and speak into the handset. They do not need to dial the extension of the loudspeaker paging system.
- (Behind Switch Mode) For single-line telephones, answering machines, fax machines, or any other device connected to a 012 or 008 OPT module or an MFM, consider assigning
 - Additional lines.
 - Any outside lines connected directly to the control unit, including special-purpose lines.

Single-line telephones can be programmed to select only the prime line (the user cannot make inside calls or use system features) or to select the Intercom button followed by the prime line or outside line (the user can place and receive inside calls and use system features).

NOTE:

For adjuncts connected using an MFM, it's recommended that you change the button 2 assignment to Intercom Originate Only and remove the button 3 assignment (in both Key and Behind Switch modes).

2. Complete the "Button Diagram" section of each copy of Forms 4b, 4d, 4e, 4f, and 5c by doing *one* of the following:

- To keep the factory-set assignments, proceed to Step 3.
- To change the factory-set assignments, skip to Step 4.

3. To keep the factory-set assignments:

- For multiline telephones in Key mode, fill in the telephone numbers on buttons 3 through 10. For future reference, also record the line numbers. (Refer to Form 2c.)
- For multiline telephones in Behind Switch mode, fill in the extension number of the prime line on the button numbered "3."

4. To change the factory-set assignments:
 1. On buttons 1 through 10, indicate the type of Intercom button by circling "Icom" for "Icom Voice," "Icom Ring," or "Icom Orig Only," and writing **Ring** or **Voice** for "Icom Orig Only."
 2. Fill in the telephone numbers (or prime-line extension numbers) to be assigned or changed. Start with the button numbered "3" and for future reference, record the line numbers on the diagram. (Refer to Form 3b.)
 3. Assign Loudspeaker Page buttons by selecting the button and writing **Page** on it.

Direct-Line Consoles

Use these instructions only if the system has one or more DLCs. Otherwise, proceed to Chapter 4 to record feature assignments on these forms for each extension.

NOTE:

For more information on DLCs, see the DLC operator's guides.

The number of line, DSS, and feature buttons assigned on a DLC depends on the type of telephone and the number of trunks connected to the system. The factory setting for DLCs is that, in addition to a System Access Voice and a System Access Ring button or Icom buttons, as many trunks as possible are assigned to each console. Each trunk appears on a separate button, which means that the number of trunks assigned is limited to the number of buttons on the console (up to a maximum of 32 on the 34-button analog DLC).

The system also assigns a Direct Station Selector (DSS) button for each extension number associated with a station and special-feature buttons that are used by the DLC operator for call handling.

Figures 3-6 and 3-7 show initial trunk and feature assignments for MLX and analog DLC consoles. See the appropriate figure as you select trunk assignments for DLCs.

NOTE:

SA buttons appear on DLCs in Hybrid/PBX mode. Icom buttons appear on DLCs in Key or Behind Switch mode.

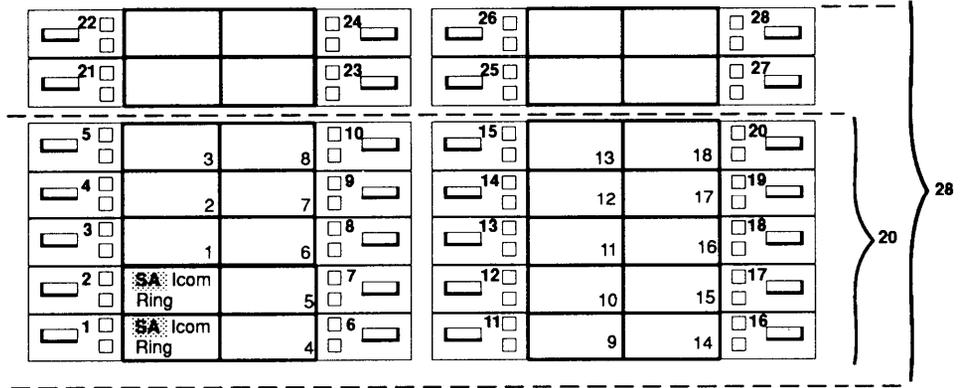
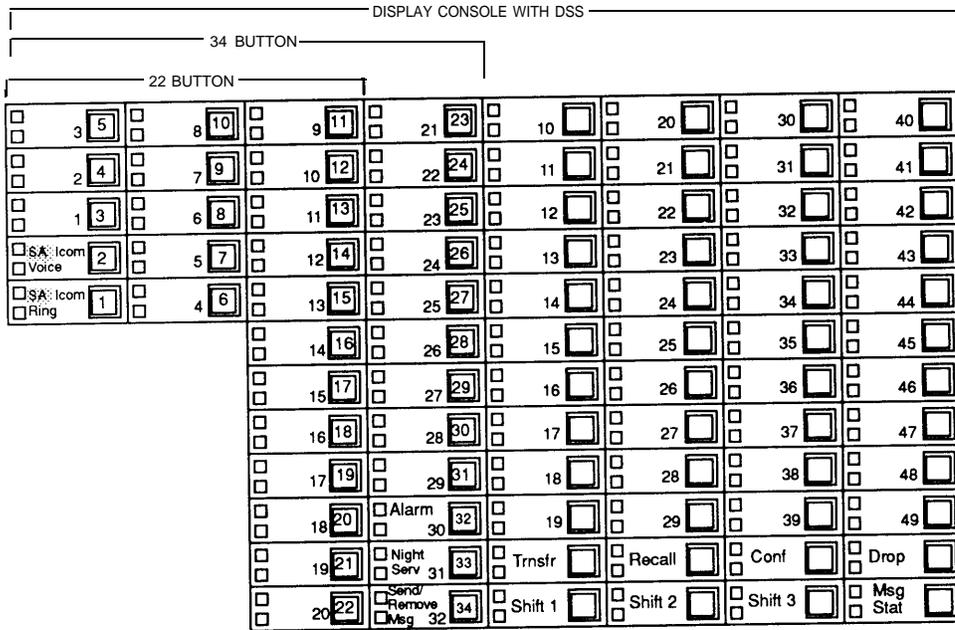


Figure 3-6. MLX DLC



Note: Alarm, Night Service, and Send/Remove Msg will be replaced with Lines 30, 31, and 32 if the system has that many lines.

Figure 3-7. Analog Multiline DLC

The system assigns trunks to buttons on DLCs in the order in which the trunks are connected to the control unit. You can change the factory-set assignments by removing, adding, or changing the order in which trunks are assigned to buttons for each DLC operator.

If the system has more than the number of trunks factory assigned to operator consoles, be sure to change the trunk assignment so that all trunks you want answered by a DLC operator appear on at least one operator position.

Decide which trunks should appear on each DLC operator console based on each operator's call-handling responsibilities. All operators may not need the same assignments. DLC operators who are responsible for answering calls for specific groups usually need only the trunks used by group members.

If the system includes a loudspeaker paging system, consider assigning a Loudspeaker Page button to DLC positions for one-touch access to the paging equipment. If the system has fewer than 30 lines, the operator-only features Alarm, Night Service, and Send/Remove Message are factory assigned as shown in Figure 3-6. The factory assignments can be changed through centralized telephone programming or by a DLC operator.

Planning Form Instructions

Complete the “Button Diagram” on each copy of Form 5a and Form 5b.

1. For the “Ring” and “Voice” buttons, circle “SA” or “Icom.”
2. Write the telephone number of the trunk you want to assign in the space on the “Button Diagram.” For future reference, record each trunk’s number. (Refer to Form 2c.)
3. Assign Alarm, Night Service, or Send/Remove Message buttons by labeling the appropriate button “Alarm,” “Nite Svc,” or “Snd/Rem Msg.”
4. Assign Loudspeaker Page buttons by selecting the button and writing **Page** on it.

Proceed to Chapter 4 to complete the remaining sections of these forms concerning feature assignments.

The system offers many optional features. This chapter contains instructions for assigning features that can be organized into the following categories:

- **Telephone Features** — assigned to individual telephones, consoles, or adjuncts
- **Operator Features** — assigned to all operator consoles
- **Group Assigned Features** — apply to functional groups of users (such as separate departments)
- **System Features** — affect all or most of the users

This chapter contains instructions for assigning these features. Detailed information about all features (including the considerations and constraints, and feature interactions that may impact their use) is contained in *Feature Reference*. It's recommended that you be familiar with this information before you attempt to perform the procedures in this chapter.

Since these are optional features, you can simply skip those sections that do not apply to the system.

Forms Needed:

In addition to the forms for each extension (partially completed in Chapter 3), the instructions in this chapter involve **System Forms 4a and 4c, System Forms 6a through 6h, 7a through 7c, 8a and 8b, and 9a through 9c**. To determine which forms are needed for each section, refer to the appropriate "Forms Needed" section.

NOTE:

The individual telephone forms are designed to be a complete record of information for that specific telephone for use in planning and programming, and for subsequent reference by the System Manager. Some features noted on the individual telephone forms are not described in this book, for example, Abbreviated Ring, Call Waiting, and Auto Line Selection. For more information about these features, refer to *Feature Reference*.

Telephone Features

This section contains instructions for assigning certain optional features to the individual telephones used by both system operators and general users:

- Pool Dial-Out Code (Hybrid/PBX mode only)
- Call Restrictions
- Forced Account Code Entry
- Microphone Operation
- Remote Call Forward
- Fax Message Waiting Receiver and Threshold

These telephone features must be assigned via system programming. There are additional telephone features noted on the forms that are not covered in this book. These features can be programmed by a user at their telephone or by the system manager using centralized telephone programming. You may, however, want to complete the information on the forms so they can serve as a complete summary of features for each individual telephone. Detailed information about these and all features is contained in *Feature Reference*. Instructions for using centralized telephone programming are contained in *System Programming*.

You may choose to use the Extension Copy feature to create a station template that can then be copied to other like telephones whose users require the same features. This feature is also described in this section.

Forms Needed:

- **System Form 2a, System Numbering—Station Jacks**
- **System Form 4b, Analog Multiline Telephone**
- **System Form 4d, MLX Telephone**
- **System Form 4e, MFM Adjunct—MLX Telephone**
- **System Form 4f, Tip/Ring Equipment**
- **System Form 5a, Direct-Line Console (DLC)—Analog**

- **System Form 5b, Direct-Line Console (DLC)—Digital**
- **System Form 5c, MFM Adjunct—DLC**
- **System Form 5d, Queued Call Console (QCC)**

Queued Call Console (Hybrid/PBX Mode Only)

Use these instructions if the system includes one or more QCCs. Otherwise, skip to the next section, “Pool Dial-Out Code Restriction.”

Forms Needed:

- **System Form 5d, Queued Call Console (QCC)**
- **System Form 2a, System Numbering—Station Jacks**
- **Floor Plan**

Planning Form Instructions

1. Transfer the identification information from Form 2a, System Numbering—Station Jacks to each copy of Form 5d by filling in the “Logical ID,” “Extension No.,” and “Person or Location” spaces.

NOTE:

The button diagram on this form is used as a guide for labeling the operator console buttons. You cannot change the button assignments shown.

2. Check the box under the “Adjuncts” heading that applies to the equipment at the extension. (Refer to the Floor Plan.)

Proceed to the next section, “Pool Dial-Out Code Restriction.”

Pool Dial-Out Code Restriction (Hybrid/PBX Mode Only)

This section contains instructions to tailor the use of pool dial-out access codes by restricting telephones from making calls on specific trunk pools—for example, those consisting of special-purpose trunks such as WATS or FX (foreign exchange), or to reserve trunk pools for data communications only.

Forms Needed:

- **Forms for individual telephones: System Forms 4b, 4d, 4e, 4f, 5a, 5b, 5c, and 5d**
- **System Form 2c, System Numbering—Trunk Jacks**

Planning From Instructions

1. Under the “Pool Dial-Out Code Restriction” heading on the individual telephone forms, fill in the information as appropriate (refer to Form 2c, System Numbering—Trunk Jacks, for the dial-out codes):
 - Check the box next to “Unrestricted from following codes” and write the codes to be unrestricted, if any.
 - Check the box next to “Restricted from following codes” and write the dial-out codes to be restricted, if any.

Call Restriction

This section contains instructions to restrict selected telephones from making outside calls and allow only intercom (inside) calls—for example, telephones in a reception area, and to control toll abuse but still allow local and intercom calls.

Planning From Instructions

Under the “Call Restriction” heading on Forms 4b, 4d, 4e, 4f, 5a, 5b, 5c, 5d, do *one* of the following:

NOTE:

If these restrictions are too limited, you can use “Allowed Lists” and “Disallowed Lists” as described later in this chapter.

- To keep the factory setting (that is, intercom, local, and toll calls can be placed), check “Unrestricted.”
- To restrict the telephone from making outside calls (that is, only intercom calls can be made), check “Outward Restrict.”
- To restrict the telephone from making toll calls (that is, intercom and local calls can be made), check “Toll Restrict.”

NOTE:

Setting this option to Outward Restrict or Toll Restrict does **not** allow reliable toll restriction on telephone company trunks that do not require 1 or 0 for toll calls. Also, the Toll Type feature does **not** apply to tie trunks.

Forced Account Code Entry

This section contains instructions for setting up the system to associate calls with corresponding accounts, clients, or projects for billing and accounting purposes.

Planning Form Instructions

Under the “Forced Account Code Entry” heading on the individual telephone forms, do *one* of the following:

- To allow users to make calls without entering an account code, check “No” (factory setting).
- To require users to enter an account code, check “Yes.”

Microphone Operation

This section contains instructions to disable the microphone on MLX telephones in areas in which use of the speakerphone is disruptive.

NOTE:

The microphone on analog multiline telephones cannot be disabled.

Planning Form Instructions

Under the “Microphone Operation” heading on Forms 4d and 5b, do *one* of the following:

- To allow speakerphone use (factory setting), check “Enable.”
- To prevent speakerphone use, check “Disable.”

Remote Call Forward

This section contains instructions to allow users to forward calls to outside numbers. Remote Call Forward provides this feature for selected telephones—for example, for users who often work away from the office.

NOTE:

Remote Call Forward cannot be assigned to QCCs.

If the telephone has a personal line assigned, you can specify that incoming calls on that trunk also can be forwarded to an outside number by assigning the telephone as the principal user of the personal line.

NOTE:

When a principal user is assigned, calls received on the personal line are also sent to individual or group coverage receivers unless the personal line button is set for no ring. Calls are not sent to Coverage if Remote Call Forward is activated.

Planning Form Instructions

1. Under the "Remote Call Forward" heading on the individual telephone forms, do *one* of the following:
 - To prevent users from forwarding calls to outside numbers (factory setting), check "Not allowed" and proceed to the next section, "(Fax) Message-Waiting Receiver."
 - To provide Remote Call Forward, check "Allowed." Then proceed to Step 2.
2. If you want a user to be able to forward the incoming calls on a specific line or lines to another number, write the trunk number(s) and telephone number in the spaces provided under the "Principal User of Personal Line" heading. (There can be more than one.) (Refer to Form 2c, System Numbering—Trunk Jacks.)

(Fax) Message-Waiting Receiver

Use these instructions only if the system has fax machines connected directly to the control unit by way of a 008 OPT or 012 module or connected to an MLX telephone using a Multi- Function Module (MFM). Otherwise, skip to the next section, "Operator Features."

NOTE:

These instructions are not applicable to fax machines connected to an analog multiline telephone using a General Purpose Adaptor (GPA).

This section contains instructions to designate from one to four telephones to receive message-waiting indications when a fax is received on a specific fax machine, and to specify the length of time before the system assumes a fax has arrived and sends the message-waiting indication.

Forms Needed:

For fax machines connected to an 008 OPT or 012 module, use System Form 4f, Tip/Ring Equipment

For fax machines connected to an MLX telephone using an MFM, use System Form 4e, MFM Adjunct—MLX Telephone or System Form 5c, MFM Adjunct—DLC.

Planning Form Instructions

In the “Fax Machine Features” section, under the “Fax Machine Receiver” heading:

1. Do *one* of the following:
 - If you are **not** assigning a Message-Waiting Receiver, check “No” and skip to the next section, “Operator Features.”
 - If you are assigning a Message-Waiting Receiver, check the second box and write the extension number of the telephone acting as the receiver in the space provided. (Refer to System Form 2a, System Numbering—Station Jacks.)
2. Under the “Fax Message Threshold” heading, do *one* of the following:
 - To keep the factory-set threshold, check “10 seconds.”
 - To change the factory-set threshold, check the second box and write the number of seconds in the space provided.
3. On individual telephone forms that describe specific telephone(s) designated as receiver(s) of fax message-waiting indications, under the “Message-Waiting Receiver” heading, write the extension number of the fax machine that sends a message-waiting indication to the telephone.

NOTE:

You will fill in the rest of the optional telephone features later.

Extension Copy

The Extension Copy feature enables you to copy an extension’s programmed buttons (with some exceptions) to one or more stations. The features are individually programmed on an extension thus creating a template that can then be copied to other extensions in the system.

Only like extensions can be copied to each other (that is, analog to analog, and MLX to MLX) since the two extension types have different button layouts. Therefore, for a system that has both telephone types, you would need two templates: one for analog, and one for MLX.

NOTE:

An MFM can be copied to or from. A DLC can only be copied to another DLC. Single-line telephones and QCCs **cannot** be copied to or from.

Forms Needed:

- **System Form 4a, Extension Copy—Analog Multiline Telephone Template**
- **System Form 4c, Extension Copy—MLX Telephone Template**

You can make additional copies of these forms and have several templates for different groups of users.

Planning Form Instructions

1. On Page 1 of Form 4a and/or 4c, write the extension number of the Master Extension and the extensions to which this template will be copied.
2. Complete the button diagram on Page 2, assigning features to the buttons. Table 4-1 contains a list of the features that can be copied, and whether the features apply to analog telephones, MLX telephones, or both. Following the table is a list of copyable operator features.

Table 4-1. Copyable Features

Feature	Analog and MLX Telephones	Analog Telephones Only	MLX Telephones Only
Account Code Entry	x		
Auto Answer All		x	
Auto Answer Intercom		x	
Auto Dial Inside	x		
Auto Dial Outside*	x		
Barge-In	x		
Camp-On	x		
Conference**	x		
Coverage Off	x		
Coverage VMS Off	x		
Data Status	x		
Do Not Disturb	x		
Drop**	x		
Extension Status 2 (Non-operator)	x		
Extension Status 1 (Non-operator)	x		
Feature Button		x	
Forward	x		
Group Calling	x		
Group Page	x		

Continued on next page

Table 4-1. – Continued

Feature	Analog and MLX Telephones	Analog Telephones Only	MLX Telephones Only
Headset Auto Answer			x
Headset Hang Up			x
Headset Status			x
Headset/Handset Mute			x
Last Number Dial*	x		
Messaging:			
Delete Message		x	
Leave Message	x		
Message Light Off	x		
Next Message		x	
Posted Message	x		
Return Call		x	
Scroll		x	
Park	x		
Pickup:			
Group	x		
General	x		
Extension	x		
Line	x		
Privacy	x		
Recall	x		
Reminder Service:			
Set	x		
Cancel	x		
Saved Number Dial*	x		
Selective Callback	x		
Signaling	x		
System Access†:	x		
SA Originate Only	x		
Voice Attribute on Button	x		
Ring Attribute on Button	x		
System Speed Dial	x		
Transfer**	x		

* Number is **not** copied.

**Behind Switch mode only.

†Ringing options (No Ring, Delay Ring, and Immediate Ring) are copied with the button.

The following are operator features than can be copied:

- Alarm
- Extension Status Off
- Extension Status 1
- Extension Status 2
- Missed Reminder
- Night Service
- Operator Park
- Send/Remove Message

On the individual telephone forms (Forms 4b, 4d, 4e, 5a, 5b, and 5c):

- a. By the extension information at the top of Page 1, check “Copied from Master Extension No.” and write the extension number of the Master Extension.
- b. Under the “Button Diagram” heading, check “See Master Extension.”

Operator Features

Operator features apply only to DLCs, QCCs, and any Direct Station Selectors (DSSs) connected to them.

Form Needed:

Form 6a, Optional Operator Features

Direct-Line Console

Use these instructions only if the system has one or more DLCs. Otherwise, skip to the next section, “Queued Call Console.”

This section contains instructions for the following two DLC operator features:

- Operator Hold Timer
- DLC Automatic Hold

Hold Timer

This section contains instructions to set the Operator Hold Timer to track the number of seconds callers are on hold for an operator. When a caller is on hold longer than the number of seconds programmed for the timer, the operator is reminded of the call by a single ring.

Planning Form Instructions

Under the “Operator Hold Timer” heading on Form 6a, do *one* of the following:

- To keep the factory setting, check “60 seconds.”
- To change the factory setting, check the second box and write the number of seconds (10 to 255 seconds) in the space provided.

DLC Automatic Hold

This section contains instructions to set DLC Automatic Hold to place calls on hold automatically when the operator presses another line button or a DSS button.

Planning Form Instructions

Under the “DLC Automatic Hold” heading on Form 6a, do *one* of the following:

- To keep the factory setting (no DLC Automatic Hold), check “Disable.”
- To automatically put calls on hold when another line or DSS button is pressed, check “Enable.”

If the system includes one or more QCCs, proceed to the next section. Otherwise, skip to the following section, “Direct Station Selector (DSS).”

Queued Call Console (Hybrid/PBX Mode Only)

Use these instructions only if the system has one or more QCCs. Otherwise, skip to the next section, “Direct Station Selector (DSS).”

This section contains instructions to set the following QCC operator features:

- Hold Return
- Automatic Hold or Release
- Queue Over Threshold
- Elevate Priority
- Calls-in-Queue Alert
- Message Center Operation
- Automatic or Manual Extended Call Completion

- Return Ring
- Position Busy Backup
- Operator Hold Timer
- Call Types

Form Needed:

Form 6a, Optional Operator Features

Hold Return

This section contains instructions to specify whether calls put on hold by a QCC operator stay on hold indefinitely or are returned to the QCC queue after the Hold Timer has expired twice.

Planning Form Instructions

Under the “Hold Return” heading on Form 6a, do *one* of the following:

- To indicate that calls stay on hold after the hold timer has expired twice, check “Remain on hold” (factory setting).
- To indicate that calls on hold return to the QCC queue after the hold timer has expired twice, check “Return to queue.”

Automatic Hold or Release

This section contains instructions to specify whether a call that is in progress on a Call button is automatically put on hold (Automatic Hold) or disconnected (Automatic Release) when the operator presses another Call button.

Planning Form Instructions

Under “Automatic Hold or Release” on Form 6a, do *one* of the following:

- To specify that calls are automatically disconnected, check “Automatic Release” (factory setting).
- To specify that calls are automatically put on hold when another Call button is pressed, check “Automatic Hold.”

Queue Over Threshold

This section contains instructions to specify the maximum number of calls allowed in the QCC queue before operators are notified (with a tone through the receiver or headset) that calls are waiting.

Planning Form Instructions

Under the “Queue Over Threshold” heading on Form 6a, do *one* of the following:

- To keep the factory setting (operators are not notified), check “0 calls.”
- To indicate that operators are notified when calls are waiting in the queue, check the second box and write the maximum number of calls in the queue before notification (any number from 1 through 99) in the space provided.

Elevate Priority

This section contains instructions to arrange the QCC queue so that important business calls are answered first.

NOTE:

During high-volume calling periods this means that only high-priority calls are delivered to a QCC within a reasonable amount of time, and low-priority calls go unanswered. To review call priority assignments, see “QCC Queue Priority” in Chapter 3.

The setting for the Elevate Priority option determines the length of time (in seconds) before calls waiting in the QCC queue are automatically assigned a higher level of priority. Although the priority of every call in the queue is then increased to a higher level, a call is never increased to highest priority (1) since priority 1 calls are those that must reach the operator as quickly as possible.

Planning Form Instructions

Under the “Elevate Priority” heading on Form 6a, do *one* of the following:

1. To indicate that the order of priority is not changed, check “0 seconds” (the factory setting).
2. To show that calls are reordered, check the second box and write the number of seconds in the space provided. (Select any number from 5 through 30 depending on the number of priority levels assigned to calls ringing into the queue and the volume of incoming calls. The recommendation for typical systems is 8 seconds.)

Calls-in-Queue Alert

This section contains instructions for setting the Calls-in-Queue Alert option to notify QCC operators (with a single ring) when a new call enters the QCC queue.

Planning Form Instructions

Under the “Calls-in-Queue Alert” heading on Form 6a, do *one* of the following:

1. To keep the factory setting (QCC operators are **not** notified when calls are waiting in queue), check “Disable.”
2. To specify that particular QCC operators are notified (with a single ring) when a call enters the queue, check “Enable” and write the extension number of each QCC position that receives the notification in the space provided. (Refer to Form 2a or Form 5d.)

Message Center

The Message Center option allows you to designate a QCC as a Message Center with the following options automatically set:

- The only incoming calls that go to the Message Center QCC are calls to the extension number of the QCC and calls sent to the QCC using Forward or Follow Me.
- Returning calls such as extended (transferred), operator-parked, and camp-on calls go to the Message Center QCC. This means that the Message Center position is different from that of the system operator who originally answered the call.
- Group Coverage calls go to the QCC Message Center.
- Direct Inward Dial (DID) calls to invalid destinations, (unassigned extension numbers) go to the QCC Message Center.

This section contains instructions to assign this feature when there is more than one QCC operator position and the customer wants one centralized location for employees to retrieve messages. Usually only one Message Center position is necessary, but there can be several QCCs in one room sharing messaging duties.

Planning Form Instructions

Under the “Message Center” heading on Form 6a, do *one* of the following:

- To indicate that no Message Center operator is assigned, check “No.”
- To assign a Message Center, check the second box and write the extension of the QCC operator position in the space provided. (Refer to Form 2a or 5d).

Extended Call Completion

Use these instructions only if the system has a QCC with a Direct Station Selector (DSS). Otherwise, skip to the next section, “Return Ring.”

This section contains instructions for changing the factory setting for Extended Call Completion from automatic to manual (that is, the QCC operator must press the Release button when using a DSS button to extend a call).

Planning Form Instructions

Under the “Extended Call Completion” heading on Form 6a, do *one* of the following:

- To keep the factory setting, check “Automatic completion.”
- To require the operator to use the Release button to extend calls, check “Manual completion.”

Return Ring

This section contains instructions to specify the number of rings before an unanswered, extended call is returned to the QCC queue (or QCC Message Center position).

NOTE:

If the system includes a voice mail system, you should increase this number to ensure that the voice mail system gets the call before it is returned.

Planning Form Instructions

Under the “Return Ring” heading on Form 6a, do *one* of the following:

- To keep the factory setting, check “4 rings.”
- To change the factory setting, check the second box and write the number of rings you want to assign in the space provided (1 through 15 rings).

Position Busy Backup

This section contains instructions to assign another telephone to receive calls when all QCC operator consoles are in a position busy (Backup On) mode. Only a calling group can be assigned as a backup for a QCC operator position.

If a backup is not designated, the system will not allow the last available operator position to go into the position busy state.

Planning Form Instructions

Under the “Position Busy Backup” heading on Form 6a, do *one* of the following:

- To indicate that no backup is assigned, check “No” (factory setting).
- To designate a backup, check the second box. (The extension number of the backup calling group will be completed later.)

Operator Hold Timer

This section contains instructions to set the system to track the number of seconds that callers are on hold at an operator. When a caller is on hold longer than the number of seconds programmed for the timer, the operator is reminded by a single ring.

Planning Form Instructions

Under the “Operator Hold Timer” heading on Form 6a, do *one* of the following:

- To keep the factory setting, check “60 seconds.”
- To change the factory setting, check the second box and write the number of seconds (from 10 to 255 seconds) in the space provided.

Call Types

This section contains instructions to assign a QCC operator to receive certain types of calls and the QCC priority level.

Planning Form Instructions

Under the “Call Types” heading on Page 2 of Form 6a:

1. In the “QCC Operator to Receive Calls” column, for each call type, do *one* of the following:
 - If QCC operators are **not** to receive the call type, write “None.”
 - If one or more QCC operators are to receive the call type, write any combination of the extension number(s). (Refer to Form 2a or 5d.)

NOTE:

You cannot assign an operator to either Follow Me calls or calls to QCC operator extensions.

2. In the “QCC Queue Priority Level” column, write the level for each call type. Assign a value of 1 (high priority) through 7 (low priority). The factory default is 4.

NOTE:

The “Group Coverage Calls” section on the back of Form 6a will be completed later in this chapter.

Direct Station Selector

Use these instructions only if the system has Direct Station Selectors (DSSs) connected to MLX operator consoles. Otherwise, skip to the next section, “Group Assigned Features.”

This section contains instructions for recording the range of extensions assigned to the Page buttons, and for renumbering the extensions for Call Park so the extensions fall within the Page button ranges.

Forms Needed:

- **System Form 6a, Optional Operator Features**
- **System Form 2d, System Numbering—Special Renumbers**
- **System Form 2a, System Numbering—Station Jacks**

Page Buttons

This section contains instructions for recording the range of extensions assigned to each of three Page buttons.

The three Page buttons should be set to reach ranges of numbers that include the extension numbers in the extension numbering plan and reflect the number of Auto Dial buttons available:

NOTE:

See “System Renumbering” in Chapter 2.

- If one DSS is connected to an operator console, set each Page button for a range of 50 numbers (matching the 50 available Auto Dial buttons).
- If two DSSs are connected, set each Page button for a range of 100 numbers. The Page buttons then control 100 Auto Dial buttons—50 on each DSS.

NOTE:

If two DSSs are used, the Page buttons on the second selector are not active.

Planning Form Instructions

In the “Page Buttons” table under the “Direct Station Selector” heading of Form 6a, write the beginning extension for the range of the 50 or 100 extension numbers for each Page button. Assign the lowest extension numbers in the plan to the first Page button, the middle range of numbers to the second Page button, and the highest extension numbers to the third Page button. (Use the information from System Form 2a, System Numbering—Station Jacks to assign the range of extensions for each Page button.)

Call Park Codes

This section contains instructions to enable operators with a DSS to have one-touch use of Call Park, that is, to put calls into a special type of hold so that the calls can be picked up from any telephone in the system.

The system automatically reserves eight extensions (881 -888) for operator parking. Consider changing these factory-set extensions to numbers that fall within the Page button ranges. The same considerations apply as those used during reassignment of extension numbers.

Planning Form Instructions

In the “Call Park Codes” table under the “Direct Station Selector” heading on Form 6a:

- Write the new codes assigned in the “Renumber to” columns.
- On Form 2d, System Numbering—Special Renumbers, write the new numbers in the “Renumber to” column of the “Call Park” section of that form.

Group Assigned Features

The system offers the following features that facilitate the call-handling responsibilities of groups of users:

- Call Pickup Groups
- Group Paging
- Coverage
- Group Calling

This section contains instructions for recording information about these features.

To determine if any of the group-assigned features is appropriate for system users, see the analysis of the Employee Communication Survey.

Forms Needed:

- **System Form 6b, Call Pickup Groups**
- **System Form 6c, Group Paging**
- **System Form 6d, Group Coverage**
- **System Form 6e, Group Calling**

Call Pickup Groups

This section contains instructions for assigning this feature to employees who work in a common area and who do not have a support person for coverage. You can assign up to 30 call pickup groups with up to 15 telephones per group. Each telephone can be assigned to only one group.

NOTE:

Compare with the "Coverage" instructions in this chapter.

Forms Needed:

System Form 6b, Call Pickup Groups

Planning Form Instructions

1. Review the analysis of question 10 on the Employee Communication Survey, and determine the number of call pickup groups needed (maximum of 30).

NOTE:

Form 6b holds the programming information for eight call pickup groups. Duplicate the form if more groups are planned.

2. For each group, write the group number in the "Group Number" space. Start with 1 and number the groups sequentially.
3. Write the name of a group, such as **Customer Service** in the "Group Name" space. (Refer to the survey analysis.)
4. Write the extension number for each group member in the "Ext. No." column. (Refer to Form 2a.)
5. Write each group member's name or location in the "Person or Location" column. (Refer to Form 2a.)

Group Paging

This section contains instructions for setting the system to allow users to make voice announcements that are heard by a particular group of employees or by everyone through their telephone speakers.

You can assign six paging groups of selected employees, such as secretarial pools, committee members, or departments, who need to hear announcements. Each group can have as many as 10 extension numbers.

The seventh paging group is factory set to page all extension numbers. This group is useful if the system does not have an external loudspeaker paging system.

The system automatically reserves extension numbers 793 through 799 for paging groups. Extension 799 is the Page All group. Decide whether to keep or to reassign the factory-set extension numbers. Keep in mind that you can provide one-touch use of Group Paging to operators with DSSs if you renumber to extensions within the Page button ranges or set the page buttons so the operators can access them.

Form Needed:

- **Form 6c, Group Paging**
- **Form 2a, System Numbering—Station Jacks**
- **Form 2d, System Numbering—Special Renumbers**

Planning Form Instructions

1. Determine the number of paging groups needed.
2. For each group, write the name of the group, such as *sales*, in the “Group ID” space.
3. To change the factory-set extension numbers:
 - a. Write the new numbers in the “Renumber To” space.
 - b. On System Form 2d, System Numbering—Special Renumbers, write the new numbers in the “Renumber To” column of the “Group Paging” section of that form.
4. Write the extension number for each group member in the “Ext. No.” column. (Refer to Form 2a.)
5. Write each group member’s name or location in the “Person or Location” column. (Refer to Form 2a.)

Coverage

Coverage allows calls to users (called senders) to be covered by one or more telephones (called receivers). Coverage can be individual or group assigned. This section contains instructions for both types.

Forms Needed:

- **System Form 2a, System Numbering—Station Jacks**
- **System Form 4b, Analog Multiline Telephone**
- **System Form 4d, MLX Telephone**
- **System Form 5a, Direct-Line Console (DLC)—Analog**

- **System Form 5b, Direct-Line Console (DLC)—Digital**
- **System Form 6a, Optional Operator Features**

Individual Coverage

This section contains instructions to allow a one-on-one arrangement in which calls from one sender are covered by one or more receivers.

A sender can have calls covered by up to eight receivers, and a receiver (such as a secretary) can provide Individual Coverage for more than one sender. Any type of telephone can be a sender; only a multiline telephone with programmable buttons available can be a receiver. The receiver must have a programmed Cover button for each sender whose calls are being covered.

A receiver can provide Primary Individual Coverage or Secondary Individual Coverage.

NOTE:

See “Personal Lines” in *Feature Reference*.

Calls on personal lines programmed for no ring are not covered.

If a principal user is assigned, calls that would be sent to Group Coverage are sent only to the principal’s Group Coverage receivers. If the principal user has Remote Call Forward, calls are sent to an outside number rather than the coverage receivers.

Forms Needed:

Individual telephone forms for sender and receiver telephones

Planning Form Instructions

1. Review the Employee Communication Survey analysis and determine which users (senders) need Individual Coverage,
2. On the appropriate form for each receiver telephone (Form 4b, 4d, 4f, 5a, or 5b), locate an available button on the “Button Diagram” and write “Ind Cover” and the sender’s extension number. Write “P” to indicate primary or “S” to indicate secondary Individual Coverage.

NOTE:

Single-line telephones cannot be receivers, and QCCs cannot be senders or receivers.

3. On the appropriate forms for the sender telephone(s), under the “Individual Coverage Receivers” heading, write the extension number for each primary and secondary receiver in the spaces provided. (Refer to System Form 2a, System Numbering—Station Jacks.)

NOTE:

A sender can have calls covered by up to eight receivers, and a receiver can provide Individual Coverage for more than one sender (up to eight buttons on one receiver telephone).

Group Coverage

In Group Coverage, senders are organized into groups and calls received by any member of the group are sent to a receiver.

Any type of telephone (excluding QCCs) can be a member of a coverage group; however, no individual sender can be a member of more than one group. A maximum of 32 coverage groups can be set up, and there is no limit to the number of senders in each group. Three types of receivers can be programmed: Calling Groups, or the QCC queue and/or multiline telephones.

NOTE:

Group Coverage can be used alone or can be set up to work with either primary or secondary Individual Coverage, or both. This allows callers to get personal attention from the primary and/or secondary Individual Coverage receiver and backup from Group Coverage. For example, a receiver such as a secretary can have a Primary Cover button to provide Individual Coverage for a sender who is also a member of a coverage group.

Forms Needed:

- **System Form 6d, Group Coverage**
- **System Form 2a, System Numbering—Station Jacks**
- Individual telephone forms for sender and receiver telephones

Planning Form Instructions

1. Review the Employee Communication Survey analysis and determine the senders to be grouped.

NOTE:

Form 6d holds information for eight coverage groups. Duplicate the form if more groups are planned.

2. Under the “Coverage Delay Interval” heading at the top of Form 6d, do *one* of the following:

- To keep the factory-set interval, check "3 rings."
- To change the factory-set interval, check the second box and write the number of rings (1 to 9) in the space provided.

3. Under the "Delayed Ring Interval" heading, do *one* of the following:

- To keep the factory-set interval, check "2 rings."
- To change the factory-set interval, check the second box and write the number of rings (1 to 6) in the space provided.

4. In each column:

- a. Write the group number in the "Group No. " space. Start with 1 and number the groups sequentially.

NOTE:

If a group is the coverage group for AUDIX Voice Power (the default is Group No. 30 but can be changed), write **AUDIX** by the group number and list the extensions of AUDIX Voice Power subscribers (see Form 2a).

- b. List the extension numbers of all senders in the group in the upper block. (Refer to Form 2a.)

- c. List the receivers for the group in the lower block by doing *one* of the following:

- Designate a calling group as a receiver by checking "Calling Group." (Refer to Form 6e.)

NOTE:

If you have not yet created calling groups, you must defer naming them as receivers until later.

- Designate the QCC queue as a receiver (Hybrid/PBX mode only) by checking "QCC queue" and/or listing the extension numbers of all receivers (maximum of eight).

5. On each copy of Forms 4b, 4d, 5a, and 5b that describes a specific receiver:

- a. Locate an available button in the "Button Diagram" area.
- b. Write "Group Cover" and the coverage group number in the space available.

NOTE:

See “Call Types” in this chapter to review assigning QCC operators to receive calls.

6. If designating the QCC Queue as a receiver (Hybrid/PBX mode only), on the “Group Coverage Calls” table on Page 2 of Form 6a:
 - a. Write the extension(s) for the QCC operator position(s) to receive the calls in the “QCC Operator to Receive Calls” column. (Refer to Form 2a.)
 - b. Write the level for each coverage group’s calls in the “QCC Queue Priority Level” column. Assign a value of 1 (highest) through 7.

NOTE:

If the system includes a voice mail system, refer to that system’s documentation for completing the receivers.

Group Calling

This section contains instructions to group the telephones of people (such as ticketing agents) who all handle the same type of call. Through the Group Calling feature all telephones in the group are assigned to a single extension number that is used by both inside and outside callers to reach the group. The individual extension numbers of the telephones are still used by callers who need to reach a specific member of the calling group.

NOTE:

The Extension Status must be set for the Group Calling/CMS configuration in order for calling groups to be available. See “Extension Status” instructions later in this chapter for details.

The system automatically reserves extension numbers 770-791 and 7920-7929 for calling groups. (These may be changed.) If operators with DSSs need one-touch use of Group Calling, renumber the extensions that fall within the Page button ranges.

Group Calling groups can be part of the group assignment for Night Service as described later in this chapter.

Forms Needed:

- **System Form 2d, System Numbering—Special Renumbers**
- **System Form 6e, Group Calling**

■ **System Form 6a, Optional Operator Features**

Planning Form Instructions

1. Review the Employee Communication Survey analysis and determine the number of calling groups needed using the following guidelines:
 - Assign up to 32 calling groups with up to 20 members per group. Each telephone user can be a member of only one calling group.
 - Designate particular trunks to ring directly into a calling group. Incoming calls on a given trunk can be directed to only one calling group.
 - If the MERLIN Attendant or another voice messaging system is being used, reserve one or more calling groups for that feature.
2. For each calling group, make a copy of both sides of System Form 6e, Group Calling.
3. For each group, on the front of Form 6e, list the extensions and trunks assigned to the group:
 - a. Write the group number in the "Group No." space. Start with 1 and number sequentially.
 - b. Write the name of the group in the "Group Name" space. (Refer to the survey analysis.)

NOTE:

If the system has AUDIX Voice Power/FAX Attendant System, fill in only the group number and group name here, then fill in the rest of the Group Calling information on Forms B and C of the AUDIX Voice Power planning forms.

- c. Do one of the following:
 - To use a factory-set extension number, write the number in the space provided (770 for group 1, 771 for group 2, etc.).
 - To change a factory-set extension number, write the new number in the "Renumber To" space, and then on System Form 2d, System Renumbering-Special Renumbers, write the Group name in the "Group ID Label" column (maximum: 7 characters), and the new number in the "Renumber To" column of the "Group Calling" section of that form.

If the system has AUDIX Voice Power/FAX Attendant System, certain extension numbers are reserved as follows:

- 7924 Fax Response
- 7925 Voice Mail
- 7926 Call Answer
- 7927 Information Service
- 7928 Message Drop
- 770 Automated Attendant

4. In the "Extensions" area of Form 6e, write the extension number of each member of the group in the "Ext. No. " column and the name of the person or location in the "Person or Location" column, (Refer to Form 2a.)

NOTE:

Before you complete the extension number and name entries, read the "Hunt Type" instructions in the next section.

5. In the "Trunks/Pools" section of Form 6e, for each trunk that is to ring directly into the calling group, write the trunk or pool number (refer to Form 2c).

NOTE:

If a trunk is in a pool, the whole pool should be assigned. Also, before adding to a Calling Group, you must first remove trunks from the QCC.

6. If assigning a calling group as backup for a QCC, mark System Form 6a, Optional Operator Features by writing the extension number of the calling group under the "Position Busy Backup" heading in the "Queued Call Console" section on the front of the form.
7. To record information for another calling group, repeat this procedure beginning with Step 3 using a blank Form 6e for each group.

Calling Group Options

The following options are available for a calling group:

- Hunt Type
- Delay Announcement
- Message-Waiting Receiver
- Calls-in-Queue Alarm Threshold
- External Alert for Calls-in-Queue Alarm
- Overflow Coverage
- Overflow Threshold
- Group Type
- Coverage Group Receiver

This section contains instructions for these options.

Forms Needed:

System Form 6e, Group Calling

Planning Form Instructions

NOTE:

If the system has AUDIX Voice Power/FAX Attendant, you do not need to fill in this information; settings will be automatically set by Integrated Administration to defaults assumed by the AUDIX Voice Power system (and not necessarily those listed for the communications system on this form). Changing the assumed defaults could affect how the AUDIX Voice Power system works. If you change these values, **do so with caution**, and record the settings on this form. For more information, see the AUDIX Voice Power documentation.

For each calling group:

1. On Page 2 of Form 6e, copy the Group No. and ID from the front of the form.
2. Select the "Hunt Type" by doing *one* of the following:
 - To keep the factory-set hunting pattern, check "Circular."
 - To change the factory-set hunting pattern, check "Linear."

NOTE:

If you choose linear hunt, be sure you have listed the extension numbers and names in the “Extensions” area on the front of Form 6e in the order that you want the group searched. If you have not done this, go back and correct the front of the form so that the extensions are in the right order.

Only one announcement device can be designated for each calling group; however, more than one calling group can use the same announcement device. The announcement device should not be assigned as a group member, and it must be outward restricted to unauthorized calls.

3. Under the “Delay Announcement” heading:

a. Do *one* of the following:

- To have no announcement device, check “No” and continue to Step 4.
- To designate an announcement device, check the second box and write the extension number for the device in the space provided. (Refer to Form 2a or 2b.)

b. On the copies of Forms 4d, 4f and 5b that describe the device(s) you are designating for delay announcement use, in the “Type” or “Adjuncts” section under “Answering Machine”:

1. Check the box that indicates that the answering machine is used as a delay announcement device.
2. Write the calling group extension number(s) for the group(s) using the device.
3. Verify that “Outward Restrict” is the selected Call Restriction option.

Each calling group can have only one telephone assigned as its message receiver. The same telephone can be assigned as the message receiver for more than one calling group.

4. To designate a telephone to receive message-waiting indications for the group, do *one* of the following under the “Message-Waiting Receiver” heading on Form 6e:

- To **not** assign a receiver, check “No.”
- To assign a receiver, check the second box and write the extension number of the Message Waiting Receiver. (Refer to Form 2a.)

5. To set the “Calls-in-Queue Alarm Threshold,” do *one* of the following:

- To keep the factory setting, check “1 call.”
- To change the factory-set number of calls allowed in the queue before members are notified, check the second box and write the number of calls (up to 99) in the space provided.

NOTE:

The external alert designated for Calls-in-Queue Alarm can be any alerting device connected through an MFM in the External Alert mode for MLX telephones. Only one external alert can be designated for each calling group. Since the signal is continuous, it is recommended that only lamp-type external alerting devices be used. An alert connected to a Supplemental Alert Adapter (SAA) for an analog multiline telephone should not be used as a Calls-in-Queue Alarm.

6. Under the “External Alert for Calls-in-Queue Alarm,”

a. Do *one* of the following:

- To **not** have an external alert for Calls-in-Queue Alarm, check “No” and skip to Step 7.
- To designate an external alert, check the second box and write the extension number for the alert in the space provided. (Refer to Form 2b.)

b. On the copies of Form 4b and 5b that describe the alerting device you are designating for Calls-in-Queue Alarm use, for “Alert device type” in the “Adjuncts” section:

1. Check the box that indicates the alert is used as a Calls-in-Queue Alarm.
2. Write the calling group extension number in the space provided.

7. On the copy of System Form 6e, Group Calling that lists the extension number for the group to be designated as the overflow calling group, under the “Overflow Coverage” do *one* of the following:

- To **not** have overflow coverage check “No” and proceed to Step 8.
- To designate overflow coverage by another calling group: check the second box and write the calling group number of the overflow calling group in the space provided.

- To designate that overflow coverage will be provided by QCC operators, check the third box.
8. Under the “Overflow Threshold” heading, do *one* of the following:
- To retain the factory setting, check “1 call.”
 - To change the threshold, check the second box and write the number of calls (up to 99) in the space provided.
9. Under the “Group Type” heading, do *one* of the following:
- To keep the factory setting of no automatic login, check “Auto Logout.”
 - To change the factory setting from Auto Logout, do *one* of the following:
 - To indicate automatic login for a CMS or a data extension, check “Auto Login.”
 - To indicate automatic login for a voice messaging system that requires special signaling for integrated operation, check “Integrated VMI.”
 - To indicate automatic login for a voice messaging system that does not require special signaling, check “Generic VMI.”
10. Under the “Coverage Group Receiver” heading, do *one* of the following:
- If the calling group does not have coverage group receivers, check “No.”
 - If the calling group has coverage group receivers, check “Yes” and write the Group No. (refer to System Form 6d).

Proceed to the next section, “System Features.”

System Features

This section contains instructions for assigning the following system features:

- Transfer of calls
- Camp-On Return Time
- Call Park Return Time
- Automatic Callback
- Extension Status

- Station Message Detail Recording (SMDR)
- Inside Dial Tone
- Reminder Service Cancel
- Redirect Calls to Unassigned Extension Numbers
- Recall Timer
- Rotary Dial Delay
- Allowed Lists
- Disallowed Lists
- Night Service
- Labeling
- Automatic Route Selection

System features affect all users and all or most of the telephones. For more information on system features, see *Feature Reference*.

Forms Needed:

- **System Form 6f, System Features**
- **System Form 6g, Allowed Lists**
- **System Form 6h, Disallowed Lists**
- **System Form 6i, Call Restriction Assignments and Lists**
- **System Form 7a, Night Service—Group Assignment**
- **System Form 7b, Night Service—Outward Restriction**
- **System Form 7c, Night Service—Time Set**
- **System Form 8a, Label Form—Posted Message**
- **System Form 8b, System Speed Dial**
- **System Form 9a, Automatic Route Selection Worksheet**
- **System Form 9b, Automatic Route Selection Tables**
- **System Form 9c, Automatic Route Selection Default and Special Numbers Tables**

Transfer Options

This section contains instructions for setting the following Transfer feature options to allow users to transfer outside or inside calls to another telephone:

- Transfer Return Interval
- One-Touch Transfer
- Transfer Audible
- Type of Transfer

Form Needed:
System Form 6f, System Features

Planning Form Instructions

1. Under the "Return Time Interval" heading in the "Transfer Options" section of Form 6f, do *one* of the following:
 - To keep the factory setting, check "4 rings."
 - To indicate no return for transferred calls, check "0 rings."
 - To change the factory-set number of rings, check the third box and write the number of rings (1 through 9) in the space provided.

NOTE:

If the system includes AUDIX Voice Power/FAX Attendant System, Integrated Administration will automatically set the Return Time Interval to "6." Also, if the system includes a voice mail system, the interval should be increased to a value greater than 4 so that the voice mail system will get the call first.

2. Under the "One-Touch Call Handling" heading, do *one* of the following:
 - To keep the factory setting, check "One-Touch Transfer" and do *one* of the following:
 - To keep the factory-set automatic completion of transfers, check "Automatic Completion."
 - To change the factory setting to manual completion, check "Manual Completion."
 - To change from One-Touch Transfer to One-Touch Hold, check "One-Touch Hold."
3. Under the "Transfer Audible" heading, do *one* of the following:
 - If the system will play music while callers are on hold, check "Music-on-Hold."
 - If the system will not provide music, check "Ringback."

4. Under the "Type of Transfer" heading, do *one* of the following:
 - For the system to select a Ring button for transferred calls, check "Ring button" (factory setting).
 - For the system to select a Voice button for transferred calls, check "Voice button."

Camp-On Return Time

This section contains instructions for designating the number of seconds a caller waits when transferred via the Camp-On feature to a busy extension. If the telephone is still busy at the end of the programmed interval, the call returns to the person who transferred the call.

Planning Form Instructions

Under the "Camp-On Return Time" heading on Form 6f, do *one* of the following:

- To keep the factory-set interval, check "90 seconds."
- To change the factory-set interval, check the second box and write the number of seconds (30 through 300) in the space provided.

Call Park Return Time

This section contains instructions for designating the number of seconds a caller waits when a person uses the Call Park feature to put a call on hold. If the call is not picked up at the end of the programmed interval, the call returns to the person who parked the call.

Planning Form Instructions

Under the "Call Park Return Time" heading on Form 6f, do *one* of the following:

- To keep the factory-set interval, check "180 seconds."
- To change the factory-set interval, check the second box and write the number of seconds (30 through 300) in the space provided.

Automatic Callback

This section contains instructions to designate the number of rings the system should wait when alerting a user about a callback attempt before the system abandons the callback attempt.

Planning Form Instructions

Under the "Automatic Callback Interval" heading on Form 6f, do *one* of the following:

- To keep the factory-set interval, check "3 rings."
- To change the factory-set interval, check the second box and write the number of rings (1 through 6) in the space provided.

Extension Status

This section contains instructions to set Extension Status to allow an operator, a calling group supervisor, or a Call Management System (CMS) supervisor to determine the status of a telephone at a glance. The lights next to the buttons on a DSS or next to Auto Dial button programmed with extension numbers indicate the status of the telephone.

Decide on the configuration and assign operator positions to monitor extension status.

Planning Form Instructions

Under the "Extension Status" heading on Form 6f:

1. Check "Assign to operator positions" and write the extension number for each operator position in the space provided. (Refer to the appropriate copy of Form 5a, 5b, or 5d.)
2. Do *one* of the following:
 - To keep the factory-set configuration, check "Group Calling/CMS."
 - To change the configuration, check "Hotel."
3. On all copies of Forms 5a and 5b, under the heading "Extension Status," check "No" or "Yes" to indicate whether or not the feature is active.

SMDR (Station Message Detail Recording) Options

Use these instructions only if connecting Station Message Detail Recording (SMDR). Otherwise, skip to the next section, "Inside Dial Tone."

This section contains instructions for connecting SMDR to keep track of telephone usage. SMDR works in conjunction with the Call Accounting System (CAS/B, CAS/H, CAT/B, or CAT/H) or a serial printer (AT&T 572 printer or equivalent) connected to the SMDR port on the control unit. The SMDR port is the upper RS-232 jack on the processor module.

NOTE:

To have accurate reports, the system date and time must be set to the current date and time when the system is installed. Be sure you checked “Yes” for each of these options on Form 1.

Form Needed:

System Form 6f, System Features

Planning Form Instructions

In the “SMDR Options” section of Form 6f:

1. Under the “Call Report Format” heading, do *one* of the following:
 - To keep the factory-set format, check “Basic.”
 - To change the report format, check “ISDN.”
2. Under the “Call Length” heading, do *one* of the following:
 - To keep the factory-set call length, check “40 seconds.”
 - To change the factory-set call length, check the second box and write the number of seconds (0 through 255) in the space provided.
3. Under the “Calls Reported” heading, do *one* of the following:
 - To keep the factory setting, check “Incoming and outgoing.”
 - To change the factory setting, check “Outgoing only.”

Inside Dial Tone

This section contains instructions for specifying whether the system uses an inside dial tone that is different from or the same as outside trunk dial tone. The factory setting is a different inside dial tone.

Some software applications, such as voice messaging systems, or hardware, such as modems, do not recognize the inside dial tone. In this case, change the system so that inside dial tone is the same as the outside dial tone to allow recognition by a third-party system, including this system.

Planning Form Instructions

Under the “Inside Dial Tone” heading on Form 6f, do *one* of the following:

- To keep the factory-set system internal dial tone, check “Inside.”
- To change the dial tone to match the outside trunk dial tone, check “Outside.”

Reminder Service Cancel

This section contains instructions for assigning Reminder Service so operators or users can have the system place reminder calls at preset times. Reminder times can be set and canceled for any telephone in the system.

A time can also be set so that all reminders are canceled at that time every day—for example, at the end of the business day when all users have gone home and are not available to receive reminders.

Planning Form Instructions

Under the “Reminder Service Cancel” heading on Form 6f, do *one* of the following:

- To **not** set a Reminder Service cancel time, check “No.”
- To set a time to cancel all reminders in the system, check the second box and write the time of day in the space provided.

Calls to Unassigned Extensions

This section contains instructions for designating that calls made to unassigned extension numbers by Remote Access users or on DID or dial-in tie trunks are redirected to another extension number, the QCC queue, or a calling group instead of to the primary operator.



CAUTION:

DID numbers that correspond to pool dial-out codes (or facility access codes) can be used to avoid toll restriction, leading to toll abuse and/or fraud. (See “Customer Support Information” in the front of this book for more information on security.)

Planning Form Instructions

Under the “Calls to Unassigned Extensions” heading on Form 6f, do *one* of the following:

- To keep the factory setting, check “Primary Operator.”
- To change from the factory-set redirect to the primary operator, check *one* of the following:
 - To redirect calls to a QCC operator (Hybrid/PBX mode only), check “QCC” and write the extension number in the space provided. (Refer to Form 2a.)
 - To redirect calls to another telephone, check “Another extension” and write the extension number in the space provided. (Refer to Form 2a.)
 - To redirect calls to a calling group, check “Calling Group” and write the calling group extension number in the space provided. (Refer to Form 6e.)

Recall Timer

This section contains instructions for designating the length of the switchhook flash sent when Recall is used to disconnect a call and get a new dialtone without hanging up. The interval of the switchhook flash and how Recall works depends on the type of telephone being used.

For multiline telephones, the factory setting is 450 ms. If users experience difficulty with Recall, the interval can be changed to a longer or shorter interval.

The single-line telephone Recall button transmits a timed switchhook flash of about half a second.

Planning Form Instructions

Under the “Recall Timer” heading on Form 6f, check *one* of the following:

- 350 ms
- 450 ms (factory setting)
- 650 ms
- 1 sec

Rotary

This section contains instructions for designating whether dialed digits on rotary dial trunks are sent one-by-one as they are dialed, or are stored and sent when dialing is completed.

Planning Form Instructions

Under the “Rotary” heading on Form 6f, check *one* of the following:

- To store digits and send them when dialing is completed, check “Delay” (factory setting).
- To send digits out as they are dialed, check “No Delay.”

Allowed Lists

Use the instructions in this section and the next (“Disallowed Lists”) only if call restrictions are assigned to any telephones. Otherwise, skip to the following section, “Night Service.”

This section contains instructions to designate an Allowed List of telephone numbers that a restricted telephone can dial.

You can design up to eight lists, each with a maximum of 10 numbers. Each number can have up to six digits—for example, an area code followed by an exchange. You can include a leading 1, which the system doesn’t count as one of the six digits, if a toll prefix is required. Once you have designed the lists, decide which restricted telephones have access to the list. Each restricted telephone can have access to one to eight lists.

If FX (foreign exchange) or tie trunks are connected to the system, you can allow people with restricted telephones to dial numbers to the area code for the FX or tie trunk if you enter the exchange in the Allowed List.

As you design each list, consider which numbers need to be called by specific groups of restricted users.

NOTE:

If you assign a zero as the first digit for any entry in an Allowed List, any toll restrictions assigned for calls to numbers that can be placed by local or toll operators are removed.

Forms Needed:

System Form 6g, Allowed Lists

Planning Form Instructions

On System Form 6g, Allowed Lists:

1. Write the name of the list in the space next to the list number.
2. Write the allowed area codes and/or exchanges in the column (a maximum of 10 entries per list).
3. Write the extension numbers of the telephones that need access to the list in the “Allow To Ext. Nos.” column. (Refer to Form 2a.)
4. If you planned Remote Access with restrictions and want to permit Allowed List numbers to remote access users, then do the following:
 - On System Form 3a, Incoming Trunks—Remote Access (Page 3), in the “Class of Restrictions without Barrier Codes” section, write the list numbers under the “Allowed List Access” heading for either or both tie and non-tie trunks.
 - On all copies of Page 4, “Class of Restriction with Barrier Codes,” write the list numbers under the “Allowed List Access” heading for each barrier code assigned.

NOTE:

Allowed List Class of Restriction assignments apply to all Remote Access users and cannot be assigned on an individual basis.

- Under the “Call Restriction” section on the individual telephone forms for each extension (System Forms 4b, 4d, 4e, 4f, 5a, 5b, 5c, and 5d), check “Allowed List(s)” and write the list numbers of the Allowed Lists authorized for the extension.

Disallowed Lists

This section contains instructions for using Disallowed Lists to prevent people from making calls to specific numbers—numbers that even unrestricted telephones cannot dial. You can use this feature instead of restricting telephones totally from making toll or local calls.

You can use a “wild card” character to indicate that you want calls to an exchange restricted in every area code. During system programming, a “pause” (entered using the Hold button) indicates a wild card character; therefore, use the letter “p” to indicate that a wild card character should be programmed.

You can design up to eight lists with a maximum of 10 numbers. Each number can have up to 11 digits—for example, a leading 1 (if a toll prefix is required for dialing) followed by the area code and telephone number. Once you have designed the lists, decide which telephones to restrict. You can assign each telephone to one to eight lists.

NOTE:

Users cannot dial a number on an Allowed List if it matches a number on a Disallowed List assigned to the telephone.

Planning Form Instructions

On System Form 6h, Disallowed Lists:

1. Write the name of the list in the space next to the list number.
2. Write the disallowed area codes and/or exchanges in the column (a maximum of 10 entries per list).
Use the wild card character ("p") to restrict an exchange from being dialed in any area code. For example, to prevent users from directly dialing the 976 exchange in any area code, write **1 p p p 9 7 6**.
3. Write the extension numbers of the telephones that you want to assign to the list in the "Disallow to Ext. Nos." column. (Refer to Form 2a.)
4. If you planned Remote Access and want to restrict callers through Disallowed Lists, then on System Form 3a, Incoming Trunks—Remote Access:
 - On page 3, under the "Class of Restriction without Barrier Codes" section, write the list numbers under the "Disallowed List Access" for either or both tie and non-tie trunks.
 - On all copies of page 4, under the "Class of Restriction with Barrier Codes" section, write the list numbers under the "Disallowed List Access" for each barrier code.

NOTE:

Disallowed List Class of Restriction assignments apply to all Remote Access users and cannot be assigned on an individual basis.

5. Under the "Call Restriction" section on the individual telephone forms for each extension (System Forms 4b, 4d, 4e, 4f, 5a, 5b, 5c, and 5d), check "Disallowed List(s)" and write the list numbers of the Disallowed Lists that the extension is restricted from using.

Call Restriction Summary

After the individual telephone forms have been completed, Form 6i, Call Restriction Assignments and Lists, can be used as a summary of and programming aid for telephone call restrictions as designated in this chapter.

Forms Needed:

- **System Form 6i, Call Restriction Assignments and Lists** 5c, and 5d
- **System Form 6g, Allowed Lists**
- **System Form 6h, Disallowed Lists**
- Forms for individual telephones: System Forms 4b, 4d, 4e, 4f, 5a, 5b, and 5c

Planning Form Instructions

On Form 6i:

1. In the "Ext. No." column, do *one* of the following:
 - Transfer the extension number from the individual telephone forms.
 - If copying from another extension, write the new extension number and then, in the "Copy From" column, write the extension from which call restrictions for this extension will be copied.
2. In the "Restriction Type" column, check the appropriate column: "Out." for Outward Restricted, "Toll" for Toll Restricted, or "Unrest." for Unrestricted.
3. In the "Allowed List" and "Disallowed List" columns, write the appropriate list numbers from Forms 6g and 6h, respectively.
4. In the "ARS Restriction Levels (FRL)" column, write the FRL value noted in the "ARS Restriction Level" heading on the individual telephone forms.

Night Service

Use these instructions only if Night Service is used for after-hours telephone operation. Otherwise, skip to the next section, "Labeling."

This section contains instructions for selecting any combination of the following options for Night Service:

- Night Service with Group Assignment
- Night Service with Outward Restriction
- Night Service with Time Set

Forms Needed:

System Forms 7a through 7c

Night Service with Group Assignment

This section contains instructions for setting Night Service so that any call that comes to the operator console while Night Service is in effect rings immediately at each available telephone in a defined group and/or at a designated Calling Group. Calls ring immediately even on trunks set for delayed ring or no ring.

You can create up to eight Night Service and/or Night Service calling groups, one for each operator. There is no limit to the number of telephones assigned to each Night Service group, and each telephone can be assigned to more than one Night Service group.

A Calling Group can be the Night Service group for more than one operator but only one Calling Group is allowed per operator.

A DID call directed to a Calling Group will not receive Night Service treatment.

Planning Form Instructions

In each column on System Form 7a, Night Service—Group Assignment, do the following:

NOTE:

Form 7a has two sides and holds information for up to eight operators.

1. Write the extension number for the operator whose calls are being answered in the "Operator Ext. No" space. (Refer to Form 2a.)

NOTE:

If the system has AUDIX Voice Power/FAX Attendant System, for each operator that will use Night Service with that system, fill in the operator's extension number and the Calling Group number for Automated Attendant. The information will be programmed using Integrated Administration.

2. Write the extension number for each member of the Night Service group or for a Calling Group in the "Ext. No." column. (Refer to Form 2a.)
3. Write each Night Service group member's name or the name of the Calling Group in the "Name" column. (Refer to Form 2a.)

Night Service with Outward Restriction

This section contains instructions for setting Night Service so that only authorized users can place non-emergency calls when Night Service is in effect. This prevents unauthorized after-hours use of telephones.

Calls to non-emergency numbers do not go through unless the password is entered first. You can include up to 10 telephone numbers on the Night Service Emergency Allowed List. Each number can have a maximum of 12 digits.

Once you specify that a password is required, the password applies to all telephones in the system when Night Service is activated at any operator position.

If users need to make after-hours calls and prefer not to enter a password, you can set up an Exclusion List that exempts those users from the password requirement. Telephones assigned to the Exclusion List keep the normal call restrictions, if any are assigned, when Night Service is in effect. However, these telephones are not protected in any other way from unauthorized after-hours use.

Planning Form Instructions

On System Form 7b, Night Service—Outward Restriction:

1. Write the password in the “Password” space. The password must be four digits and can include the numbers 0 to 9 in any combination.

NOTE:

To keep the password private, do not fill in the blank.

2. Write the numbers to be included in the list under “Telephone No.” in the “Emergency Allowed List” section.
3. To exclude users from the password requirement, complete the “Exclusion List” section

NOTE:

All AUDIX Voice Power and FAX Attendant System ports are automatically included in the Exclusion List by Integrated Administration. However, to keep a record of these, you may choose to review Form 2a and, for all extensions listed as ports, copy the extension number to this list.

- a. Write the extension number for each telephone in the “Ext. No.” column. (Refer to Form 2a.)
- b. Write each user’s name in the “Name” column. (Refer to Form 2a.)

Night Service with Time Set

This section contains instructions for setting the system to automatically turn Night Service on and off at the times and days of the week you specify. This ensures that after-hours calls are handled properly even if an operator forgets to turn on Night Service.

Operators can still override the timer and turn Night Service on or off manually. The feature can also be deactivated through system programming for special conditions, such as a mid-week holiday.

Planning Form Instructions

On System Form 7c, Night Service—Time Set, write the time of day you want Night Service turned on (“Start Time”) and off (“Stop Time”) for each day of the week. Use 24-hour numbering, called military time—for example, 5:30 pm = 1730.

If Night Service is to remain on throughout the day—for example, on Sunday—don’t enter an on and off time.

Labeling

Labeling enhances the capability of display telephones used with the system. The following types of labels appear on display telephones:

- Extensions and Calling Groups
- Trunks
- Posted Message
- System Directory/System Speed Dial

Labels for extensions are described in Chapter 2, labels for trunks are described in Chapter 4, and labels for Calling Groups are described earlier in this chapter.

This section contains instructions for assigning labels for Posted Message and System Directory/System Speed Dial.

Forms Needed:

- **System Form 8a, Label Form—Posted Message**
- **System Form 8b, System Speed Dial**

Posted Message

This section contains instructions for allowing users to post a message telling callers who have display telephones why they cannot answer.

There can be as many as 20 messages. Messages 1 through 10, shown on Form 8a, are already programmed in the system, and 10 more can be added, for a total of 20. In a Release 2.0 system, messages 2 through 9 can be changed. (In a Release 1.0 or 1.1 system, all 10 of the original messages can be changed.)

Form Needed:

System Form 8a, Label Form— Posted Messages

Planning Form Instructions

On System Form 8a, Label Form—Posted Message, do *one* of the following:

NOTE:

Posted messages can contain as many as 16 characters, including capital letters, numbers, ampersand (&), dash (—), space, colon (:), asterisk (*) and pound sign (#).

- To add posted messages (that is, to change from the default custom messages, for example, “CUSTM MSG11”), write each new message next to its message number (11 through 20) in the “Revised Message” column.
- To change existing messages, cross out the message and write the new message in the “Revised Message” column.

NOTE:

Message #1, Do Not Disturb, cannot be changed, starting with Release 2.0.

System Speed Dial

This section contains instructions for designating system-wide frequently used numbers. You can assign and store up to 130 3-digit System Speed Dial codes. To call these numbers, users simply dial the 3-digit codes after pressing the **Feature** button.

Assign System Speed Dial codes to telephone numbers that shouldn't be displayed on telephones, such as numbers that contain access codes. You can also assign labels to the System Speed Dial codes. These labels are listed in the System Directory so that MLX telephone users can search for them and dial System Speed Dial numbers with the touch of a button.

Forms Needed:

System Form 8b, System Speed Dial

Planning Form Instructions

1. Review the analysis of question 9 on the Employee Communication Survey.
2. On System Form 8b, System Speed Dial:

NOTE:

As a visual aid to distinguish lines during programming, every fourth line on the form is shaded.

- a. Write the label to be displayed for the number in the "Labels" column.
- b. Write each telephone number in the "Telephone Number" column.
- c. To **not** display the number, check "No" in the "Display" column.

Automatic Route Selection

This section contains instructions for using Automatic Route Selection (ARS) to allow the most efficient use of trunks connected to the system, which can mean significant savings for the customer's business. Routing calls efficiently is especially important if the business has several different types of trunks, such as local, WATS, FX (foreign exchange), or tie, or uses an alternate long-distance company. If the system is pooled, you can use ARS to specify which trunk pool should be used for each call, based on the telephone number the caller dials.

NOTE:

With ARS, users must dial "1" before dialing any 7- or 10-digit toll number, even if the local telephone company does not require dialing a toll prefix.

You can define up to 16 ARS tables (each with two subpatterns based on time of day). Four additional tables are factory set and are designed to save programming time.

In this section, you will define a set of ARS tables. This set includes a list of area codes and exchanges associated with each table, the preferred and alternate routes (if any) for each subpattern, and the FRL for each route. As the customer becomes more familiar with the calling patterns of the company, and with the intricacies of ARS, they may want to change these patterns to suit their particular installation.

NOTE:

It is recommended that all systems operating in PBX mode use ARS, even if only central office trunks are available. This provides additional flexibility for future upgrading of facilities and allows predesignated emergency calls to be put through regardless of restrictions placed on an extension.

Forms Needed:

- **System Form 9a, Automatic Route Selection Worksheet**
- **System Form 9b, Automatic Route Selection Tables**
- **System Form 9c, Automatic Route Selection Default and Special Numbers Tables**
- **System Form 2c, System Numbering—Trunk Jacks**

ARS Worksheet

This section contains instructions for completing the ARS worksheet to decide how to best route calls.

Forms Needed:

- **System Form 9a, Automatic Route Selection Worksheet**
- **System Form 2c, System Numbering—Trunk Jacks**

Planning Form Instructions

1. Review Form 2c, System Numbering—Trunk Jacks, for the types of trunks available.
2. Record the number of exchanges in the local calling area in the blank at the top of Form 9a. If you aren't sure how many exchanges there are, consult the telephone directory.
3. Enter the number of each of the trunk pools (factory setting is 70 or 890-899) in the "Trunk Pool No." column.

NOTE:

If you have renumbered the trunk pools, check the "Renumber To" column of Form 2c for the trunk pool extension numbers.

Some trunk pools, such as in-state WATS trunk pools, can be used for both toll and local calls. (Note that with ARS a local call is any call that doesn't require dialing a 1.) If people will use a particular trunk pool for both toll and local calls, enter the number of that trunk pool in the worksheet twice, and note the reason.

4. For each trunk pool number entered:
 - a. Record the type of trunk (local, FX, regional WATS, etc.) in the pool in the "Trunk Type" column.
 - b. Check the appropriate column: "Toll" or "Local," under "Type of Dial," for the type of call that should be dialed on each trunk pool:
 - Toll: Any call that has a series of digits that begins with a 1, followed by an exchange or area code. When placing a toll call using ARS, callers dial 11 digits (1 + 3 [area code] + 3 [exchange] + 4 [last four digits of the number]) or 8 digits (1 + 3 [exchange] + 4 [last four digits of the number]).
 - c. Enter the total number of different area codes or exchanges that the pool should serve in the "Number of Area Codes or Exchanges for which Trunk Pool is Used" column.

Keep in mind that callers must dial 1 before dialing the area code, even if they don't normally need to dial a toll prefix to make a toll call. Users who dial eight digits may want to avoid the delay while the system makes sure all digits are dialed by dialing a # after the eighth digit. This signals the system that all digits are dialed.

- Local: Any call that does not fall under the definition of Toll. This includes 7-digit dialing still required in some areas.

If you don't know the exact number of exchanges or area codes, enter a note such as "All area codes in the U.S. except the 15 served by the regional WATS trunks." Keep in mind that you're recording how many different area codes or exchanges the pool should access, not the area codes or exchanges themselves.

This step helps identify the preferred trunk pools for toll and local calls. (Preferred pools are the trunk pools on which the system places each call unless a different route has been specified for that particular type of call.)

5. Under the "Preferred Trunk Pools" heading:
 - a. Determine which of the toll trunk pools is used for calls to the greatest number of different area codes. Write the number of that trunk pool in the space next to "Toll Calls."
 - b. Determine which of the local trunk pools is used for calls to the greatest number of different exchanges. Write the number of that trunk pool in the space next to "Local Calls."

NOTE:

Tables 17 and 18 are explained later.

Figure 4-1 shows the completed Automatic Route Selection Worksheet for the fictitious company McHale and Associates of Denver, Colorado. McHale has a local trunk pool, an in-state WATS pool, and a cross-country WATS pool. Because Colorado has two area codes (303 and 719), the in-state WATS trunk can be used for both toll and local calls. Therefore, there are two entries for Pool 890 on the worksheet.

The cross-country WATS trunk pool serves the greatest number of different area codes, every area code in the country except the two area codes in Colorado. Therefore, it is the preferred trunk pool for toll calls.

The in-state WATS trunk pool serves the greatest number of different exchanges. It is the preferred trunk pool for calls to every exchange in area code 303 except the 20 exchanges in the local calling area. Therefore, it is the preferred trunk pool for local calls.

Automatic Route Selection Tables

This section contains instructions for using the information you recorded on the worksheet to prepare the ARS tables. The system can have as many as 20 ARS tables—16 are programmed and 4 are factory set (dial zero, special number, default local, and default toll tables).

Because of the complexity of ARS routing, the instructions for filling out the planning forms are presented a few steps at a time with examples of completed forms shown after each group of steps. The instructions begin with the programmable tables (1 through 16) and introduce the factory-set tables midway through the process.

Forms Needed:

- **System Form 9b, Automatic Route Selection Tables**
- **System Form 9c, Automatic Route Selection Default and Special Numbers Tables**

Complete Form 9b for each trunk pool listed on the ARS worksheet (Form 9a).

Planning Form Instructions

On each copy of Form 9b:

1. Write the table number in the "Table No." space (maximum 16). Start with 1 and number sequentially.
2. Check the appropriate box under the "Type of Table" heading: 6-Digit, Area Code, Exchange, or 1 + 7.
3. Do *one* of the following:
 - If this is **not** a 1 + 7 table, skip to Step 4.
 - If this is a 1 + 7 Table, do *one* of the following:
 - If users do **not** need to dial a 1 to reach numbers within their own area code, check "not within area code" (factory setting).
 - If users need to dial a 1 to reach numbers within their own area code, check "within area code."
4. Complete the section of the form headed "Area Code/Exchanges" by doing *one* of the following:
 - If this is a 6-Digit Table, write the area code on the blank line next to entry 001. Then write each exchange in that area code to be called on the numbered lines, beginning with the entry 002.

Up to 99 exchanges can be listed in any order. If you need to list more area codes or exchanges, prepare another 6-Digit table.

- If this is an Area Code, Exchange, or 1 + 7 Table, write the area codes or exchanges on the numbered lines, beginning with the entry 001.

Up to 100 area codes or exchanges can be listed in any order, but area codes and exchanges cannot be on the same table.

NOTE:

The digits before the blank lines represent the table entry number used while programming.

Example 1: If a business plans to use Table 1 to route calls to exchanges 333, 444, and 523 in area code 816, the upper section of the completed Form 9b will look similar to Figure 4-2.

Maximum: 16 Tables. (Make a copy for each table.)

Table No. 1

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1 +7, dialing from
 - within area code
 - not within area code ◆

Area Code/Exchanges

001 <u>816</u>	021 _____	041 _____	061 _____	081 _____
002 <u>333</u>	022 _____	042 _____	062 _____	082 _____
003 <u>444</u>	023 _____	043 _____	063 _____	083 _____
004 <u>523</u>	024 _____	044 _____	064 _____	084 _____
005 _____	025 _____	045 _____	065 _____	085 _____
006 _____	026 _____	046 _____	066 _____	086 _____
007 _____	027 _____	047 _____	067 _____	087 _____
008 _____	028 _____	048 _____	068 _____	088 _____
009 _____	029 _____	049 _____	069 _____	089 _____
010 _____	030 _____	050 _____	070 _____	090 _____
011 _____	031 _____	051 _____	071 _____	091 _____
012 _____	032 _____	052 _____	072 _____	092 _____
013 _____	033 _____	053 _____	073 _____	093 _____
014 _____	034 _____	054 _____	074 _____	
015 _____	035 _____	055 _____		
016 _____	036 _____			
017 _____	037 _____			
018 _____				
019 _____				

Figure 4-2. Example 1: System Form 9b

Example 2: If the business plans to use Table 7 to route calls to the northeastern (band 1) WATS trunks as entries 001 through 015, the upper section of the completed form will look similar to the one shown in Figure 4-3.

Maximum: 16 Tables. (Make a copy for each table.)

Table No. 7

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1 + 7, dialing from
 - within area code
 - not within area code ◆

Area Code/Exchanges

001 413	021 _____	041 _____	061 _____	081 _____
002 617	022 _____	042 _____	062 _____	082 _____
003 203	023 _____	043 _____	063 _____	083 _____
004 508	024 _____	044 _____	064 _____	084 _____
005 401	025 _____	045 _____	065 _____	085 _____
006 516	026 _____	046 _____	066 _____	086 _____
007 518	027 _____	047 _____	067 _____	087 _____
008 914	028 _____	048 _____	068 _____	088 _____
009 717	029 _____	049 _____	069 _____	089 _____
010 201	030 _____	050 _____	070 _____	090 _____
011 603	031 _____	051 _____	071 _____	091 _____
012 207	032 _____	052 _____	072 _____	092 _____
013 215	033 _____	053 _____	073 _____	093 _____
014 802	034 _____	054 _____	074 _____	
015 609	035 _____	055 _____		
016 _____	036 _____			
017 _____	037 _____			
018 _____				
019 _____				

Figure 4-3. Example 2: System Form 9b

Subpatterns

For each table (1 through 16, and factory-set Tables 17 and 18), you can select two subpatterns (“A” and “B”) that specify routes that should be used depending on the time of day. You can specify up to six routes for each subpattern. For example, you may want calls to certain area codes routed over WATS trunks during the day, and after 11 p.m., when toll rates are less expensive on basic trunks, you may want the calls routed over the main pool.

Planning Form Instructions

In the “Subpattern” sections on Form 9b and Form 9c:

1. To direct calls differently according to time of day, write a time for each subpattern in the “Time of Day” space (for example, 8 a.m.).
2. To complete the “Pool” column for each subpattern, write the number of the preferred trunk pool next to the number 1. This is the pool on which calls to the area codes or exchanges listed in the “Area Code/Exchanges” section of this form should be placed.

If you want to designate a backup pool in case all the trunks in the first-choice pool are busy, write the number of the backup trunk pool next to the number 2, and so on.

3. To complete the “FRL” column, enter a value of 0 through 6, which determines the Facility Restriction Level for users. The least restrictive is 0, and the most restrictive is 6. Assign a value of 0 if you want all users to access the route and 1 through 6 to restrict calling for the route to specific users only.

Subpattern Example: The form for a typical Area Code Table, illustrated in Figure 4-4, shows a table to route calls to the 13 area codes served by the northeastern (band 1) WATS lines beginning at 8 a.m. with no restrictions. The number of the northeastern WATS pool, 891, is on the first line in the “Subpattern A” section. The time, 8:00 a.m., is in the “Time of Day” space, and an FRL of 0 indicates no restrictions. The 11 p.m. in the “Time of Day” space for Subpattern B and Pool 70 in the “Pool” column indicates that calls to these area codes are to be routed over the main pool after 11 p.m.

Maximum: 16 Tables. (Make a copy for each table.)

Table No. 2

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1+7, dialing from
 - within area code
 - not within area code ◆

Area Code/Exchanges

001 413	021 _____	041 _____	061 _____	081 _____
002 617	022 _____	042 _____	062 _____	082 _____
003 203	023 _____	043 _____	063 _____	083 _____
004 508	024 _____	044 _____	064 _____	084 _____
005 401	025 _____	045 _____	065 _____	085 _____
006 516	026 _____	046 _____	066 _____	095 _____
007 518	027 _____	047 _____	076 _____	096 _____
008 914	028 _____	057 _____	077 _____	097 _____
009 717	029 _____	058 _____	078 _____	098 _____
010 201	039 _____	059 _____	079 _____	099 _____
011 603	040 _____	060 _____	080 _____	100 _____

Subpattern A Time of Day <u>8:00 am</u>				
Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type**
1 891	0	_____	1 _____	v
2 890	4	_____	2 _____	v
3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____

Subpattern B Time of Day <u>11:00 pm</u>				
Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type**
1 70	0	_____	1 _____	v
2 890	4	_____	2 _____	v
3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____

◆ Factory Setting
 *Hybrid/PBX mode only
 **Select Voice only, Data only, or Both.

Figure 4-4. Subpattern Example

Because calls to the 15 area codes shown on Figure 4-4 should be placed on the cross-country WATS trunks if all the northeastern WATS trunks are busy, the number of the cross-country WATS pool, 890, is used in both cases. An FRL of 4 is assigned to restrict some users from using the cross-country WATS trunks.

Planning Form Instructions (Subpatterns Continued)

4. If extra digits at the beginning of the dialed number may be required for the system to place a call on a particular pool, enter the digits (0 through 9) in the same row as the pool number, in the column headed "Other Digits."

These special access or account codes can range from a single digit, such as 9, to a maximum of 20 digits.

Other Digits Example: If a business uses an alternate long-distance company for calls to nine area codes in Canada, accessing the alternate long-distance company lines requires getting a local line and dialing seven digits. The completed form for the Area Code Table that routes these calls to the alternate long-distance company lines is shown in Figure 4-5.

Maximum: 16 Tables. (Make a copy for each table.)

Table No. 3

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1 + 7, dialing from
 - within area code
 - not within area code ♦

Area Code/Exchanges

001 <u>604</u>	021 _____	041 _____	061 _____	081 _____
002 <u>403</u>	022 _____	042 _____	062 _____	082 _____
003 <u>306</u>	023 _____	043 _____	063 _____	083 _____
004 <u>204</u>	024 _____	044 _____	064 _____	084 _____
005 <u>807</u>	025 _____	045 _____	065 _____	_____
006 <u>705</u>	026 _____	046 _____	_____	095 _____
007 <u>519</u>	027 _____	_____	076 _____	096 _____
008 <u>416</u>	028 _____	057 _____	077 _____	097 _____
009 <u>613</u>	_____	058 _____	078 _____	098 _____
010 _____	039 _____	059 _____	079 _____	099 _____
_____	040 _____	060 _____	080 _____	100 _____

Subpattern A Time of Day _____					Subpattern B Time of Day _____				
Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**	Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**
1 <u>70</u>	_____	<u>905012</u>	1 _____	<u>1</u>	1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____	2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____	3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____	4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____	5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____	6 _____	_____	_____	6 _____	_____

♦ Factory Setting
 *Hybrid/PBX mode only
 **Select Voice only, Data only, or Both.

Figure 4-5. Other Digits Example

Planning Form Instructions (Subpatterns Continued)

5. If the system must absorb certain digits dialed by users to place calls on a particular pool, enter the appropriate absorption number in the same row as the pool number, in the column headed "Absorb."

Assign a value of 0 if you do not want absorption. Assign a value of 1 through 11 according to the number of digits you want absorbed, starting with the first digit dialed.

Absorb Example: If a company has FX trunks for the 686 exchange in the 901 area code and wants to allow people to dial those calls the same way they dial toll calls to other area codes, an absorption number of 4 is assigned to the FX trunk pool, Pool 893. The completed form for the 6-Digit Table that routes calls to the FX trunk pool is shown in Figure 4-6.

Maximum: 16 Tables. (Make a copy for each table.)

Table No. 4

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1 + 7, dialing from
 - within area code
 - not within area code ◆

Area Code/Exchanges

001	<u>901</u>	021 _____	041 _____	061 _____	081 _____
002	<u>686</u>	022 _____	042 _____	062 _____	082 _____
003	_____	023 _____	043 _____	063 _____	083 _____
004	_____	024 _____	044 _____	064 _____	084 _____
005	_____	025 _____	045 _____	065 _____	_____
006	_____	026 _____	046 _____	_____	095 _____
007	_____	027 _____	_____	076 _____	096 _____
008	_____	028 _____	057 _____	077 _____	097 _____
009	_____	_____	058 _____	078 _____	098 _____
010	_____	039 _____	059 _____	079 _____	099 _____
_____	_____	040 _____	060 _____	080 _____	100 _____

Subpattern A Time of Day _____					Subpattern B Time of Day _____				
Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type**	Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type**
1	<u>893</u>	_____	1 <u>4</u>	<u>1</u>	1	_____	_____	1 _____	_____
2	_____	_____	2 _____	_____	2	_____	_____	2 _____	_____
3	_____	_____	3 _____	_____	3	_____	_____	3 _____	_____
4	_____	_____	4 _____	_____	4	_____	_____	4 _____	_____
5	_____	_____	5 _____	_____	5	_____	_____	5 _____	_____
6	_____	_____	6 _____	_____	6	_____	_____	6 _____	_____

◆ Factory Setting
 *Hybrid/PBX mode only
 **Select Voice only, Data only, or Both.

Figure 4-6. Digit Absorption Example

After ARS is programmed, people in the Figure 4-6 company dial 1 + 901 + 686-XXXX to make these calls. The system absorbs the leading 1 and the area code and dials only the 7-digit number to place these calls on one of the FX trunks.

Planning Form Instructions (Subpatterns Continued)

6. To complete the "Call Type" column, enter *one* of the following:
 - For voice only calls, enter **V**.
 - For data only calls, enter **D**.
 - For both voice and data calls, enter **V/D**.
7. If you have worked only one of your planned non-default tables, complete all copies of Form 9b. Repeat Steps 1 through 6 for each table (Tables 1 through 16) that you need.
8. If you haven't completed the factory-set tables, do so now:
 - a. For Tables 17 (Default Toll) and 18 (Default Local), repeat Steps 1 through 6 to complete the subpattern and pool routing sections.
 - b. For the Dial 0 table (Table 19) complete the "Pool" routing, "FRL," and "Other Digits" entries following Steps 2 through 4.
 - c. If users need to dial an access code to call the special numbers 411, 611, 811 and 911, record that code on the Special Number Table, under the heading "Other Digits." Assign the FRL as shown in Step 3.

NOTE:

Assigning a restrictive FRL could impair the ability to dial 911.

9. If restricting extensions and Remote Access users from specific routes, locate all copies of pages 3 and 4 of Forms 3a and Forms 4b, 4d, 4e, 4f, 5a, 5b, and 5c, and do the following:
 - a. Under the "ARS Restriction Level" heading on each telephone form, write the value (0 to 6) you want to assign.
 - b. Under the "ARS Restriction Level" heading on pages 3 and 4 of Form 3a, check the value (0 to 6) you want to assign.

Extension and Remote Access FRL values equal to or greater than the FRL value assigned to routes allow users to access those routes. A value of 0 is the most restrictive, and a value of 6 is the least restrictive. The factory-set FRL value assigned to extensions is 3.

To restrict a extension from specific routes, assign an FRL value to the extension that is lower than the route's value.

For example, if you want a telephone used by a top executive to

have unlimited use of any ARS route, assign a value of 6. If you want to limit a user from making calls on pools with special-use trunks such as WATS, assign a value of 0.

Using its circuit-switched connections, the system can establish a dedicated communications path between two data endpoints for the transfer of data. This connectivity enables the system to be used to share resources as well as to establish and manage connections between computers and other data input and output devices. In addition, it can be used to support advanced network services that integrate voice and data, such as video conferencing. System features provided for voice service, such as Automatic Route Selection, Call Restriction, Idle Line Preference and others, can be employed to enhance the usage of data facilities.

This chapter contains some background information and then instructions for planning data communications, including analog and digital data stations.

For detailed information about the system's data communications capabilities, the configurations and features that support those capabilities, and a typical data communications application, refer to the *Equipment and Operations Reference*.

Data Communications Configuration Overview

The system control unit (hardware and software) in conjunction with other external hardware devices provide data connectivity for the following:

- Internal analog data stations
- Connection to external analog data stations via analog facilities (GS, LS, Tie, DID), or via dedicated analog facilities, or via a DS1 Digital Service Link (DSL) providing emulated GS, LS, Tie or DID or PRI
- Internal digital data stations
- Connection to external digital data stations via a PRI facility
- Circuit-switched connections between two similar type data stations
- Circuit-switched connection between a digital data station (on a B-channel) and an analog data station via two-stage dialing through a conversion resource (modem pool)
- Conversion resources, such as 7500B data module/modem pools for making connections between dissimilar data stations
- Data Hunt Groups (DHGs)
- Simultaneous voice and data on analog and MLX ports
- On-premise Host Computer access
- Local area network (LAN) access via a modem or 7500B Data Module connected to an RS-232 port on a workstation on the LAN

Data Stations

A data station is a combination of equipment (for example, a telephone, PC, printer, or fax machine) used to send and receive data (and voice if the station includes a telephone). There are two types of data stations:

- **Analog Data Stations** - require a modem. Can support analog data and analog voice, analog data only, or analog data and digital voice.
- **Digital Data Stations** - require a data module. Can support digital data and digital voice, or digital data only.

If the system includes both analog and digital data stations that need to communicate with each other, at least one modem pool must be set up as well. A modem pool is at least one data module and modem working together to convert digital and analog signals from one type of data station (digital or analog) to another.

The data equipment may have options that can be set for transferring and receiving data. Also, PC-based or workstation-based data stations require a communications software and terminal emulation package to transfer and receive data. For more information, refer to the documentation for instructions.

Table 5-1 shows the equipment configuration required for each type of data station. For more information about analog data stations and digital data stations, refer to the *Equipment and Operations Reference*.

NOTE:

- The first data station type (analog data and analog voice) requires a bridging adapter to connect the telephone to the two ATL station jacks.
- The last data station type (digital data only) requires a terminating resistor adapter to connect the data module to the MLX station jack.

Table 5-1. Data Station Configurations

Type of Data Station	Module and Jack Type	Telephone (for voice)	GPA or MFM	Modem or Data Module	Data Terminal
Analog data and analog voice	2 adjacent station jacks on one of the following ATL modules: 408, 408 GS/LS, or 008	analog multiline telephone (and a BR-241-B1 bridging adapter)	GPA	modem	PC
Analog data only	1 station jack on an 008 OPT or 012 module	none	none	modem	PC, LAN workstation, or local host
Analog data and digital voice	1 station jack on an 008 MLX or 408 GS/LS-MLX module	any MLX telephone	MFM	modem	PC
Digital data and digital voice	1 station jack on an 008 MLX or 408 GS/LS-MLX module	any MLX telephone	none	data module	PC
Digital data only	1 station jack on an 008 MLX or 408 GS/LS-MLX module	none	none	data module (and a 440A4 terminating resistor adapter)	PC, LAN workstation, local host, or video conferencing

Other Supported Digital Data Endpoints

Other data equipment that may be connected as digital data endpoints via a data module include the following:

- Video conferencing system
- Group 4 fax unit

For information about these applications, refer to the *Equipment and Operations Reference*.

Modem Pools

A call between an analog data station and a digital data station is possible only if the system includes a modem pool to convert signals from analog to digital and vice versa. A modem pool requires at least one modem and data module working together as a pair.

The system is set up so that a data call can be sent to a *data hunt group*, which is an extension in the system that is dedicated to the modem pool. When the data call reaches the data hunt group, the data call is directed to the appropriate modem (if the call is analog) or data module (if the call is digital).

An important aspect of modem pools is that call origination is in **one** direction only. Specifically, modem pools can be set up to convert signals as follows:

- **Digital-to-Analog:** Converts digital signals to analog signals so that a digital station can communicate with an inside or outside analog station.
- **Analog-to-Digital:** Converts analog signals to digital signals so that an analog data station can communicate with an inside or outside digital data station.

The following modem pool configurations can be used:

- Digital-to-analog modem pool
- Analog-to-digital modem pool
- Digital-to-analog modem pool on dedicated outside lines

For more information on these configurations, refer to the *Equipment and Operations Reference*.

Data Hunt Groups

A data hunt group (DHG) consists of a specified group of station ports *of the same type* (for example, all analog or all digital) assigned to a common access Calling Group number. When a call is placed to a DHG, the switch performs a circular search (starting with the station listed after the one that received the last Calling Group call) to find the first idle station. The idle station is alerted and when it answers, it is connected to the originator. If all the stations in the DHG are busy, the originator hears ringback.

DHGs support the following:

- Modem pools

NOTE:

One important aspect of a modem pool is the specific direction of call origination. All the units (for example, modems) on one side of the modem pool can be grouped into a DHG, so users only need to dial one number for any pair.

- Dedicated lines for data service
- A host computer with multiple ports
- A workstation (gateway) on a LAN

Planning Overview

By using the procedures earlier in this book, you should have already reserved the following:

- trunk jacks for outside trunks
- station jacks for voice telephone users
- station jacks for either:
 - analog multiline telephones with an analog data station connected to a General Purpose Adapter (GPA)
 - MLX telephones with either an analog data station connected via an MFM or a digital data station connected-via an 75006 Data Module.

NOTE:

Features and trunks for analog data stations connected to an analog multiline telephone via a GPA cannot be assigned independently of the telephone. This includes reserving two consecutive analog station jacks on the control unit for the Simultaneous Voice and Data feature.

On a new system, you can either plan and program voice communications equipment first and data communications equipment second, or plan and program voice and data equipment concurrently.

Planning Forms

Whether you are planning data options for a new system or modifying an existing system, record your decisions on the appropriate data forms shown in Table 5-2. Duplicate the master forms in Appendix B and work on the copies. Use the System Forms listed in Table 5-3, as needed.

Table 5-2. Data Forms

To Plan New or Modify Existing	Use These Forms
Modem pools	1a, Modem Pool — Analog to Digital 1b, Modem Pool — Digital to Analog
Note: To plan or modify Digital to Analog modem pools using dedicated outside trunks, you may need telephone circuits from your local telephone company.	
Trunks assignments	2a, Analog Data Station 2b, Digital Data Station
Feature assignments	2a, Analog Data Station 2b, Digital Data Station
Data hunt groups	3, Data Hunt Groups

Table 5-3. System Forms

To Plan	You Need System Form	To Use as Reference	To Make Entries
Station jack connections <ul style="list-style-type: none"> ■ analog data stations ■ digital data stations ■ local host computer connections ■ IAN workstation access connections ■ modem pools <p>Note: Modem pool planning includes station jack identification and determining pool type — analog-to-digital or digital-to-analog.</p>	2a, System Numbering—Station Jacks (for all configurations)	✓	✓
Trunk assignments	2a, System Numbering—Station Jacks 2b, System Numbering—Digital Adjuncts	✓ ✓	
Note: Behind Switch is not included in these instructions.	2c, System Numbering—Trunk Jacks	✓	
Feature assignment	2a, System Numbering—Station Jacks 2b, System Numbering—Digital Adjuncts 4d, MLX Telephones 4b, Analog Multiline Telephone 4e, MFM Adjunct—MLX Telephone 5b, Direct-Line Console (DLC)—Digital 5c, MFM Adjunct—DLC	✓ ✓ ✓ ✓ ✓ ✓ ✓	
These features also need			
■ pool dial-out code (Hybrid/PBX only)	2c, System Numbering—Trunk Jacks	✓	
■ ARS Facility Restriction (Hybrid/PBX only)	9b, Automatic Route Selection Tables 9c, ARS Default and Special Numbers Table	✓ ✓	
■ data hunt groups	2c, System Numbering—Trunk Jacks 2d, System Numbering—Special Renumbers 6e, Group Calling	✓ ✓ ✓	

Station Jacks

Planning how data equipment connects to station jacks on the control unit involves the following tasks:

1. Review System Form 2a, on which you entered codes (A for analog, D for digital, and B for basic telephone) and find the telephone type and the user, location, or function for each data station to be connected. Table 5-4 shows station jack types, corresponding module types, and the equipment that can be connected.

NOTE:

Plan the connections for analog data, digital data, and local host computer communications stations according to the following instructions only if the system includes that station type.

2. Add the station jack assignments to System Form 2a using the appropriate "Planning Form Instructions" in this section.

Table 5-4. Station Jack Types

Station Jack Type	Module Type	Connects
Analog	008 408 408 GS/LS	Analog multiline telephones (including telephones with an analog data station connected through a GPA)
Digital	008 MLX 408 GS/LS-MLX	MLX telephones (including telephones with an analog data station connected through an MFM) MLX telephones (including telephones with 9500B modules) Digital data stations connected through 7500B Data Modules
Basic Telephone	012 008 OPT	T/R equipment: Single-line telephones Adjuncts, such as answering or fax machines Analog data stations (using modems) Tip/ring equipment in another building or off premise

Analog Data Stations

An analog data station consists of a data terminal connected to the control unit using an internal or external modem. This station does not include a telephone.

Assign a basic telephone station jack on an 012 or 008 OPT module; either an on- or off-premise station can be connected to an 008 OPT module.

Planning Form Instructions

Record the station jack assignments for analog data stations on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “B” next to the number for each basic station jack.
2. In the “Person, Location, or Function” column, write **modem** and then identify each analog data station by person, location, or function.

Digital Data Stations

A digital data station consists of a PC or a data terminal connected to a data module.

Although only one logical ID is assigned to each digital station jack, the system automatically assigns two extension numbers: the extension number shown on Form 2a is assigned to an MLX telephone connected to the digital station jack, and a second extension number is assigned to each jack. The second extension number is reserved for an adjunct such as an analog data station connected to the MLX telephone through an MFM or a digital data station connected through a data module and data terminal. Both extension numbers are automatically assigned whether or not the station includes an MFM or 7500B Data Module. Calls can be placed to both extension numbers independently. Note that an MLX station cannot have both a data module and an MFM. The digital data station uses only the adjunct extension.

Each digital data station connects to a digital station jack on an 008 MLX or 408 GS/LS-MLX module.

Planning Form Instructions

Record the station jack assignments for digital data stations on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “D” next to the number for each digital station jack.
2. In the “Person, Location, or Function; column, write **7500B Data Module** and identify each digital data station by person, location, or function.

3. Fill in System Form 2b with the logical ID and the extension number of the 7500B Data Module.

Local Host Computer Data Stations

A local host computer data station consists of a local host computer, a data terminal, and a data module. Digital signals from the data station are converted by the data module to RS-232 data signals (and vice versa) so that the host computer can receive the signals.

Modems convert digital data signals to analog signals (and vice versa).

Assign each data module used for access to a host computer to a digital station jack on an 008 MLX or 408 GS/LS-MLX module and each modem to a basic telephone station jack on an 012 or an 008 OPT module. Users access the computer by placing a data call to the extension number for either a data module or modem assigned for communications with the local host computer.

If you have a limited number of data modules or modems to share among many users, assign some or all of the modems or data modules to a data hunt group. In this way, users can access all the conversion resources in the data hunt group by dialing one extension number.

Planning Form Instructions

Record the station jack assignments for local host computer access stations on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “D” next to the number for each digital station jack used to connect an 7500B Data Module.
2. In the “Person, Location, or Function” column, write **7500B-host**.
3. In the “Jack Type” column, make sure there is a “B” next to the number for each basic telephone station jack you plan to use to connect a modem.
4. In the “Person, Location, or Function” column, write **modem-host**.

LAN Workstations

Local Area Network (LAN) workstations are PCs connected together to share resources.

Assign each data module used for access to a LAN workstation to a digital jack on an 008 MLX or 408 GS/LS-MLX module. Each modem must be connected to a basic telephone station jack on an 012 or 008 OPT module.

To access the workstation, users place a data call to the extension number reserved for either an 7500B Data Module or modem.

If you have a limited number of 7500B Data Modules or modems that must be shared by many users, you can assign some or all of the modems or data modules to a data hunt group. In this way, users can access all the conversion resources in the data hunt group by dialing a single extension number.

Planning Form Instructions

Record the station jack assignments for access to a workstation on a LAN on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “D” next to the number for each digital station jack you plan to use to connect an 7500B Data Module.
2. In the “Person, Location, or Function” column, write **7500B-LAN**.
3. In the “Jack Type” column, make sure there is a “B” next to the number for each basic telephone station jack used to connect a modem.
4. In the “Person, Location, or Function” column, write **modem-LAN**.

Modem Pools

A modem pool consists of one or more pairs of data modules and modems. Modem pools convert digital data signals to analog data signals or convert analog data signals to digital signals and are called “conversion resources.” A modem pool allows data communications between digital data stations and analog data stations.

An analog-to-digital modem pool is used to call digital data stations from analog stations. A digital-to-analog modem pool is used to call analog data stations from digital stations.

A modem pool can use either system trunks or dedicated outside trunks and can be either analog to digital or digital to analog.

Modem pools using dedicated outside trunks are useful when

- many data calls are made and you want to be sure data trunks are kept separate from outside system trunks used for voice calls
- the business uses specialized outside trunks (such as private circuits for high-speed transmission) for data communications.

Modem Pools Using System Trunks

Calls to and from outside data stations are placed through outside trunks connected to the system. These trunks can be reserved for members of a modem pool, or they can be the same trunks that are used for voice communications.

For a modem pool using a system trunk, assign one digital station jack for each data module and one basic station jack for each modem.

Planning Form Instructions

Record the station jack assignments for modem pool equipment on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “D” next to the number for each digital station jack used to connect an 7500B Data Module.
2. In the “Person, Location, or Function” column, write **7500B-modem pool**.
3. In the “Jack Type” column, make sure there is a “B” next to the number for each basic telephone station jack you plan to use to connect a modem.
4. In the “Person, Location, or Function” column, write **modem-pool**.

Modem Pools on Dedicated Trunk

To dedicate an outside trunk exclusively for data communications, you can bypass the control unit and connect the outside trunk directly to a modem in a modem pool. The trunk is then dedicated for use with that modem pool pair only.

Modem pools on dedicated trunks require only one digital station jack for each 7500B Data Module.

NOTE:

Data calls placed using modem pools on dedicated outside trunks bypass the control unit and are not reported by Station Message Detail Recording (SMDR).

Planning Form Instructions

Record the station jack assignments for modem pools on dedicated outside trunks on System Form 2a, System Numbering—Station Jacks:

1. In the “Jack Type” column, make sure there is a “D” next to the number for each digital station jack used to connect an 7500B Data Module.
2. In the “Person, Location, or Function” column, write **7500 B-modem pool dedicated**.

Analog-to-Digital Modem Pool

To create an analog-to-digital modem pool, choose a modem and a data module to be paired and the number of pairs you want in the modem pool.

When modems and 7500B Data Modules are connected to station jacks, an extension number is automatically assigned to each. To create an analog-to-digital modem pool, if you have only one modem pair in the pool, publish the extension number assigned to the modem. If you have more than one pair and the modems are assigned to a data hunt group, publish the extension for the data hunt group.

If you have more than one modem and data module pair (member) in your modem pool, use a data hunt group to distribute incoming calls uniformly among members in the group. A data hunt group can include up to 20 members.

Do not assign system trunks and dedicated outside trunks in the same modem pool.

Planning Form Instructions

The logical ID and extension numbers for the modems and data modules assigned to each analog-to-digital modem pool are listed on System Form 2a, System Numbering—Station Jacks.

Record the analog-to-digital modem pools on Data Form 1a, Modem Pool—Analog to Digital:

NOTE:

Data Form 1a provides planning space for 4 modem pools. If you are planning more than 4 modem pools, make copies of Data Form 1a.

1. Number the modem pools consecutively—starting with 1. Write the number in the “Modem Pool Number” space at the top of each modem pool block.
2. If you have more than one pair and members will be grouped in a data hunt group, check the “Yes” box. You will enter the extension number when you create the data hunt group.
3. In the “Modem” column, write the logical ID and extension number of each modem in the modem pool. On the same trunk, in the “Data Module” column, write the logical ID and extension number of the 7500B Data Module you want paired with the modem in the first column.

Digital-to-Analog Modem Pool

To create a digital-to-analog modem pool, choose a data module and modem to be paired and choose the number of pairs you want in the modem pool.

When modems and 7500B Data Modules are connected to station jacks, an extension number is automatically assigned to each. To create a digital-to-analog modem pool, if you have only one pair in the pool, publish the extension number assigned to the 7500B. If you have more than one pair and the 7500Bs are assigned to a data hunt group, publish the extension for the data hunt group.

Do not assign system trunks and dedicated outside trunks in the same modem pool.

If you have more than one modem and data module pair (member) in your modem pool, use a data hunt group to distribute incoming calls uniformly among members in the group. A data hunt group can include up to 20 members.

Planning Form Instructions

The logical ID and extension numbers for the modems and data modules assigned to each digital-to-analog modem pool are listed on System Form 2a, System Numbering—Station Jacks.

Record digital-to-analog modem pools on Data Form 1 b, Modem Pool—Digital to Analog:

NOTE:

Data Form 1 b provides planning space for 4 modem pools. If you are planning more than 4 modem pools, make copies of Data Form 1 b. Also, if the modem pool uses dedicated outside trunks, get the telephone number of the outside trunks from your local telephone company.

1. Number the modem pools consecutively—starting with 1. Write the number in the “Modem Pool Number” space at the top of each modem pool block.
2. If you have more than one pair and members will be grouped in a data hunt group, check the “Yes” box. You will enter the extension number when you create the data hunt group.
3. If the modem is connected to the control unit, write the logical ID and extension number of each 7500B Data Module in the modem pool in the “Data Module” column. On the same trunk, in the “Modem” column, write the logical ID and extension number of the modem you want paired with the data module in the first column.

If the modem is connected to a dedicated outside trunk, leave the “Logical ID” space blank and write the telephone number in the “Extension” column. Be sure not to mix dedicated outside trunk connections with control unit connections.

Assigning Trunks to Data Stations

The following types of outside trunks can be used to make and receive data calls to and from data stations outside the system:

- A **loop-start (LS) trunk** is the standard for home and small businesses, and can be used to communicate with outside analog data stations. Loop-start trunks are the least expensive trunks in some areas, but have the following disadvantages:
 - They do not protect against *glare*, a condition that occurs when an outside call is made at the same time that an incoming call arrives on the same trunk.
 - They cannot provide reliable far-end disconnect for toll restriction.
- A **ground-start (GS) trunk** is preferred for communication with outside analog data stations. Ground-start trunks provide improved signaling and reliable far-end disconnect for secure toll restriction.

The following kinds of outside ground-start/loop-start trunks can be used for data communications:

- Basic trunks
- Wide area telecommunications service (WATS)
- 800 service (inbound WATS)
- Foreign exchange (FX)

Ground-start/loop-start trunks connect to ground-start/loop-start jacks on the following types of modules in the control unit:

- 800 GS/LS
- 400 GS/LS/TTR
- 408 (LS trunks only)
- 408 GS/LS
- 400 (LS trunks only)
- 800 (LS trunks only)
- 408 GS/LS-MLX

- A **tie trunk** provides communication between two telephone switching systems. A tie trunk “ties” the two systems together, providing access to all telephones or data stations on each system. Tie trunks are usually used for data communication with analog data stations connected to a system at a different location, such as a different floor of a building, a different building, or a different city or state.

A tie trunk connects to a jack on a 400EM module in the control unit.

- A **direct inward dial (DID) trunk** allows incoming calls to reach specific individuals or facilities in the system without the help of a system operator. DID trunks are available only in the Hybrid/PBX mode. A DID trunk is used to receive incoming calls from outside analog data stations; it is not used for outgoing calls.

A DID trunk connects to a jack on an 800 DID module in the control unit.

- A **DS1 trunk** carries digital signals in the Digital Signal 1 (DS1) format. A DS1 trunk can be used for communication with outside digital or analog data stations.

A DS1 trunk connects to the jack on a 100D module in the control unit. Even though there is only one physical jack, the 100D module supports up to 24 logical endpoints or ports for voice and data calls; each DSO channel in the DS1 signal corresponds to a trunk or logical ID.

A DS1 trunk provides either T1 or PRI access (PRI must be used for digital data calls).

- **T1**—(the factory setting) A T1 facility is used for communication with outside analog data stations. The 24 channels on a T1 facility can be programmed individually in any combination to emulate a loop-start, ground-start, E&M tie, or DID trunk, so a single 100D module can replace 24 outside trunks. Digital data calls cannot be placed through this trunk.
- **PRI** - The standard format for ISDN services provided by connection to a 5ESS central office (CO) switch or a 4ESS™ toll switch.

The 100D module supports any combination of the following AT&T Switched Network services:

- ACCUNET switched digital service for 56-kbps and 64-kbps restricted and 64-kbps clear circuit-switched data calls
- Megacom 800 for incoming domestic toll-free voice calls
- Megacom WATS service for outgoing domestic long-distance voice calls
- Software Defined Network (SDN) for circuit-switched voice and data calls at up to 56 kbps

To assign trunks to data stations, you decide on the types of line buttons that are assigned to the data terminal portion of each digital or analog data station and to each modem and 7500B Data Module. This includes

- analog data stations connected through MFMs to MLX telephones
- digital data stations that include a telephone
- analog data stations
- digital data stations

For detailed information and programming requirements for trunks, refer to *Equipment and Operations Reference*.

NOTE:

Trunks cannot be independently assigned to analog data stations connected to analog multiline telephones using a General Purpose Adapter (GPA). The trunk assignment for the telephone also includes the analog data station; therefore, these instructions are not used for these types of data stations.

Planning Form Instructions

For analog data stations that are connected to an MLX telephone using an MFM, use System Form 4e, MFM Adjunct—MLX Telephone and System Form 5c, MFM Adjunct—DLC. You should have already filled out preliminary information on these forms when you planned voice communications. The trunks for the MLX telephone have already been assigned.

There are two different forms for data stations:

- **Data Form 2a** is for analog data stations, for modems included in modem pools, for modems used to communicate with the local host computer, or for modems used to communicate with a workstation on a LAN.
- **Data Form 2b** is for digital data stations and for 7500B Data Modules included in modem pools, Data modules used to communicate with the local host computer, or Data Modules used to communicate with a workstation on a LAN.

Make enough copies of each form so that you can complete one form for each piece of data equipment.

From System Form 2a, System Numbering—Station Jacks, obtain the identification information for each data station.

Record the information on the appropriate Data Form (2a or 2b) for each data station and for each modem and 7500B Data Module included in a modem pool or used to communicate with a local host computer or with a workstation on a LAN:

1. In the “Logical ID” space write the logical ID for each station.
2. In the “Extension No,” space, write the extension number for each station.
3. In the “Person or Location” space, write the name of the person or the location of the data equipment.
4. Under the “Data Station Use” heading, check the “Individual use,” “local host computer,” or “LAN workstation” box to indicate the use for the data station.

Each analog or digital data station (including an analog data station connected to an MLX telephone via an MFM) and each modem or 7500B Data Module pair is treated by the system as a multibutton telephone with 34 buttons.

When you choose the mode of operation (Key, Behind Switch, or Hybrid/PBX), Intercom or System Access buttons are automatically assigned to every station connected to the control unit. However, you can customize the system by changing the factory-set assignments and reassigning line buttons. The number and types of buttons assigned depends on the mode chosen and the type of station jack you are using.

Assigning Trunks in Hybrid/PBX Mode

The line buttons you can assign to data stations are

- **System Access Ring** — used to make and receive inside and outside data calls. To make outside calls, the user selects an outside trunk by dialing either the code for Automatic Route Selection (ARS) or the dial-out code for the trunk pool. Users at digital data stations can also dial the trunk number (801 - 880) to select an outside trunk.
- **System Access Originate Only** - used only to make inside and outside calls. Calls are not received on this button so that the data user always has a line available to make data calls. To make outside calls, the user selects an outside trunk by dialing either the code for ARS or the dial-out code for a trunk pool. Users at digital data stations can also dial the trunk number (801 - 880) to select an outside trunk.
- **Personal Line** - used to make and receive outside data calls from a data station on a specific outside trunk. A personal line is an outside trunk assigned to a line button on one or more data or voice stations. The outside trunk cannot be a member of a trunk pool. To dedicate an outside trunk for data calls and have the calls automatically answered at a data station, do not assign the same outside trunk to both data stations and telephones because modems answer voice calls as data calls.

On analog data stations, the personal line can be used to receive incoming calls. You can use the personal line for outgoing calls by selecting the line button on the analog multiline telephone, dialing on the analog multiline telephone, and then activating the modem connected through a GPA.

On digital stations, the personal line can be used to make and receive outside data calls. For an outgoing call, dial the trunk number (801 – 880) to select the trunk.

To allow the user at a digital station access to the digital network for making and receiving calls to outside digital stations, assign PRI trunks as personal lines. If PRI trunks are not available, the digital data station user can make calls over the regular analog telephone network only by using a digital-to-analog modem pool.

NOTE:

- You must use PRI facilities with ACCUNET Switched Digital Data service for digital stations.
- PRI trunks can also be used for analog data and voice calls and can be assigned to telephones to allow the voice user to make and receive voice calls using these types of facilities.

- **Pool** —used when you want the data station to make and receive outside data calls on a specific trunk pool (for example, a pool with PRI channels) without dialing a dial-out code. The Pool button is used to make and receive only outside calls. To make an outside call, the data station user selects the pool button and dials the telephone number.

NOTE:

Do not assign System Access Voice buttons for data stations,

The following line button assignments are factory set for Hybrid/PBX mode and are prerecorded on the “Button Diagram” on Data Forms 2a and 2b:

- One System Access Originate Only button and two System Access Ring buttons are assigned to all analog data equipment connected to an 012 or 008 OPT module.
- One System Access Originate Only button and one System Access Ring button is assigned to all data equipment connected to a digital station jack on an 008 MLX or 408 GS/LS-MLX module.

The factory settings can be changed; however, the settings should be adequate to meet most user needs since System Access lines can be used to make both inside and outside data calls. Each data station must have at least one System Access button.

If you want a data station (digital only) to make and receive outside data calls on a specific outside trunk, assign a Personal Line button. If you want the data station to make and receive outside calls on a specific trunk pool, assign a Pool button.

Assigning Lines to Data Stations

For the data station to make and receive outside calls on a specific trunk pool, assign a Pool button.

To allow users outside the system access to the modem pool, assign outside trunks to the data hunt group that is assigned to the modem pool (you will assign trunks to modem pools later). If a data hunt group is not assigned to the modem pool, you must assign personal lines or pools to the modem for analog-to-digital modem pools or to the 7500B Data Module for digital-to-analog

modem pools.

To dedicate a specific trunk or pool to receive outside data calls, assign a personal line or pool to a data station, modem pool, or data hunt group that is assigned to a modem pool.

To dedicate specific trunks for use in data communications only (such as Primary Rate Interface channels or other special data lines), consider grouping those trunks in a pool.

If the system uses Automatic Route Selection, follow the instructions on ARS earlier in this book to specify routes for outgoing data calls.

To restrict non-data users from dial access to data trunk pools, use the "Pool Dial-Out Code" instructions later in this chapter.

Planning Form Instructions

Locate System Form 2c, System Numbering—Trunk Jacks.

Record your decisions for each data station on the Hybrid/PBX Mode "Button Diagram" of Data Form 2a or 2b.

1. If you want to assign personal lines to the data station, write **Personal Line** and the telephone number (from System Form 2c) of the outside line on the appropriate button. For digital stations, include the trunk number.
2. If you want to assign a pool to the data station, write **Pool** and the pool's extension number (from System Form 2c) on the appropriate button.

NOTE:

On analog data stations where the user does not need to make internal calls, you can assign only personal lines or pools; the user will get a CO trunk by automatic line selection when going off-hook. This will automatically get central office dial tone.

Assigning Trunks in Key Mode

There are two kinds of line buttons you can assign to data stations used to make and receive data calls:

- **Intercom Ring** — used to make and receive inside data calls only.
- **Outside Trunk** — used to make and receive outside data calls on a specific outside trunk. An outside trunk can be assigned to a line button on one or more data or voice stations. To 'dedicate an outside trunk for data calls and have the calls automatically answered at a data station, do not assign the same outside trunk to data stations and to telephones because modems answer voice calls as data calls.

For digital stations, the outside trunk can be used to make and receive outside data calls. For an outgoing call, dial the line number (801 – 880) to select the trunk.

To allow the user at a digital station access to the digital network for making and receiving calls to outside digital stations, assign PRI trunk to digital stations. If PRI trunk (with ACCUNET Switched Digital Data Services) are not available, the digital data station user can make calls over the regular analog telephone network only by using a digital-to-analog modem pool.

NOTE:

PRI trunks can also be used for analog data and voice calls and can be assigned to telephones to allow the voice user to make and receive voice calls using these types of facilities. You must use PRI trunks with ACCUNET Switched Digital Data Services for digital data stations.

The following line button assignments are factory set for Key mode and are prerecorded on the “Button Diagram” on Data Forms 2a and 2b:

- Two Intercom Ring buttons are assigned to all data equipment connected to an 012 or 008 OPT module.
- Two Intercom Ring buttons are assigned to all equipment connected to a digital station jack on an 008 MLX or 408 GS/LS-MLX module.

The factory settings can be changed; however, at least one Intercom button must be assigned to each data station. To allow the user to make and receive outside data calls, you must assign outside trunk to the data station.

To allow users outside the system access to your modem pool, you can assign an outside trunk to the data hunt group that is assigned to the modem pool (you will assign trunk to modem pools later). If a data hunt group is not assigned to the modem pool, you must assign an outside trunk to the modem for analog-to-digital modem pools or to the 7500B Data Module for digital-to-analog modem pools.

To dedicate a specific line to receive outside data calls, assign an outside trunk to a data station, modem pool, data hunt group, LAN, or local host.

On a digital or analog station the user selects an outside trunk by dialing the Idle Line Preference code (usually 9) on an Intercom button. On a digital data station the user can also select trunks assigned to the station by dialing the line number (801 – 880) assigned to that outside trunk.

It is extremely important that the factory-set Idle Line Preference (the line to which the user is automatically connected when going off-hook) not be changed. (The user must be connected to an intercom line to activate features such as Privacy or to select an available outside trunk by dialing the Idle Line Preference code.)

Planning Form Instructions

Using System Form 2c, System Numbering—Trunk Jacks for reference, record your decisions for each data station on the Key Mode “Button Diagram” of Data Form 2a or 2b. If you want to assign outside trunks to the data station, write the telephone number (from System Form 2c) of the outside trunk on the appropriate button. For digital stations, include the trunk number.

Assigning Features to Data Stations

This section describes how to assign features to each digital or analog data station and to each modem and 7500B Data Module pair. This includes analog data stations connected to an MLX telephone using an MFM, digital data stations that include a telephone, and analog and digital data-only stations (data stations that do not include a telephone).

NOTE:

- Features cannot be independently assigned to analog data stations connected to analog multiline telephones using a General Purpose Adapter (GPA). The feature assignment for the telephone also includes the analog data station; therefore, the following planning instructions are not used for these types of data stations.
- All members of a modem pool should have the same feature assignment.

The following optional features can be assigned to data stations:

- **Account Code Entry** allows tracking of outgoing data calls for billing, forecasting, or budget reports.
- **Auto Answer All** allows a modem with automatic answering capability to answer data calls when the user is away from the station. This feature supports Analog Voice and Analog Data Stations only.
- **Automatic Route Selection** (Hybrid/PBX mode only) routes calls over outside trunks according to the number dialed and the trunks available. Therefore, the system can be programmed to select the least expensive route for each data call. When using ARS with digital data calls, make sure that the calls use the PRI interface.
- **Call Restriction** inhibits line access, which enables companies to control and manage communications costs for outgoing data calls.
- A **Data Status** button allows monitoring station activity (busy, not busy) of any data station. Although this feature is similar to having an **Inside Auto Dial** or **Signaling** button because it lights the green LED to indicate station-busy status, pressing the button has no effect. It does not dial the data station number. Thus, the button does not interfere with a data call in progress, unlike an **Auto Dial** button, which dials its programmed number.

- **Dial Access to a DFT** provides access from a digital data station to outside lines supporting the PRI interface.
- **Idle Line Preference** automatically selects the first available line for data calls.
- **Last Number Dialed** automatically places a call to the last number dialed from that station. Dialing sequence must include dial-out code for outside calls.
- **Personal Speed Dial** allows for quick dialing (a 2-digit code) for frequently-used numbers. Dialing sequence requires a dial-out code for outside calls.
- **Pool Access to external transmission facilities** (Hybrid/PBX Mode only) allows data endpoint dialing to seize access to pool numbers servicing outside lines and trunk.
- **Privacy** prevents loss of data by ensuring that data transmission is not interrupted accidentally. Privacy is automatic for data calls on digital data stations and on analog data stations with analog multiline telephones. Privacy is activated manually on all other analog data stations.
- **System Speed Dial** allows quick dialing of numbers that are used often and provide for data security. Dialing sequence requires a dial-out code for outside calls. The System Speed Dial feature is programmed system wide for both voice and data stations. Follow the instructions earlier in this book to assign System Speed Dial codes to data station users.

NOTE:

Certain system (voice) features interfere with data connections. System features that must be disabled are the following:

- Voice Announce
- Call Waiting
- Automatic Callback

This section describes how to record some of these optional features. For all of the optional features, you record them on Data Form 2a, Analog Data Station and Data Form 2b, Digital Data Station, System Form 4e, MFM Adjunct—MLX Telephones, and System Form 5c, MFM Adjunct—DLC.

For detailed information on the features, refer to *Feature Reference*. For information on planning for features not described in this section, use the guidelines presented in the appropriate section earlier in this book.

Pool Dial-Out Code

Use these instructions only if the system is operating in the Hybrid/PBX mode.

When a data station is first connected, the user can access any trunk pool by dialing the dial-out code assigned to the pool. However, you can restrict data stations from using one or more trunk pools.

The pool dial-out code restriction places data calls only on specific trunk pools: for example, to restrict users to trunk pools that are made up of special data lines such as PRI channels used for data services or to reserve other trunk pools for voice communications only.

Planning Form Instructions

Use the “Optional Features” section of Data Form 2a or 2b for each data station to record your decisions:

1. Under the “Pool Dial-Out Code Restriction” heading, if you want the data station restricted from using one or more trunk pools, check “Yes.”
2. Use System Form 2c, System Numbering—Trunk Jacks to locate the dial-out codes for each pool that the data station is restricted from using. Write the dial-out codes on the lines below the “Yes” box. If the data station is a member of a modem pool, assign the same restriction to **all** members of the pool.

Call Restrictions

When the system is first set up, all data stations are unrestricted. This means that you can place local and long- distance calls from all data stations. However, you can restrict selected data stations from making any outside calls and allow only intercom (inside) calls. This is useful for data stations used only for accessing a local host computer.

The calling privileges you assign to a modem or data module in a modem pool determine what types of outside and toll calls are permitted and which line or pool is used for the call. For example, a person with a data station restricted to inside calls only can place an outside call using a modem pool if the modem or data module used in the second stage of dialing is not restricted.

You can also restrict the types of data calls made through modem pools. For example, to restrict a digital-to-analog modem pool to local calls to a host computer in your city, you can restrict the modems from making long-distance calls but still allow intercom and local calls. This type of restriction is useful to prevent the abuse of long-distance calling privileges.

NOTE:

Since modems in digital-to-analog modem pools on dedicated outside trunks are not connected to the control unit, they cannot be restricted by the system.

If modem pools are to be used by outside callers, modems or data modules can be restricted from making outside calls (to prevent abuse of services) by setting up separate pools for incoming and outgoing calls.

NOTE:

If you assign restrictions to a modem pool, assign the same restriction to **all** members of the pool. If these restrictions are too limited, you can use the Allowed List feature to set up numbers (such as local host computer numbers) that can be dialed regardless of the restriction on the data station. Or, instead of restricting the data stations, you can use the Disallowed List feature to set up numbers that cannot be dialed by any user.

Planning Form Instructions

Use the "Optional Features" section of Data Form 2a or 2b for each data station to record your decisions. Under the "Call Restriction" heading:

1. If you do **not** want Call Restrictions, check "Unrestricted."
2. If you want the data station restricted from making any outside calls (only intercom calls can be made), check "Outward Restrict."

If the data station is a member of a modem pool, be sure to assign the same restriction to all members of the pool.

3. If you want the data station restricted from making long- distance calls (intercom and local calls can be made), check "Toll Restrict."

If the data station is a member of a modem pool, be sure to assign the same restriction to all members of the pool.

Forced Account Code Entry

The Forced Account Code Entry feature can be used for billing or for tracking data calls by requiring data station users to enter account codes (1 to 16 digits) for outside calls. Assign this feature to data stations so that you can associate outgoing data calls with specific client accounts.

NOTE:

Account codes cannot be used to track incoming calls to data stations.

Planning Form Instructions

Use the "Optional Features" section of Data Form 2a or 2b for each data station to record your decisions. Under the "Forced Account Code Entry" heading, do

one of the following:

- If the user must enter an account code for outgoing calls, check “Yes.”
- If you do not want the feature assigned to the data station, check “No.”

Ringling Options

For modems assigned to a digital-to-analog modem pool, set the ringing option for the line buttons to “No Ring.” This prevents the modem from answering calls placed in error to the wrong side of the modem pool (the side away from the data hunt group or extension assigned to the modem in an analog-to-digital modem pool or to the 7500B Data Module in a digital-to-analog modem pool).

Planning Form Instructions

On the “Button Diagram” section of Data Form 2a or 2b for each data station, for each outside trunk, write “No Ring” on the trunk provided on the left side of the button.

ARS Facility Restrictions Level

Use these instructions only if the system is operating in the Hybrid/PBX mode.

If the system uses Automatic Route Selection (ARS) for data calls, you can assign a Facility Restriction Level (FRL) to each data station. This value (from 0 to 6) corresponds to the FRL assigned to each route and is used to restrict data users from access to specific routes. Before restricting a data station, review the values assigned to each route.

To restrict a data station from specific routes, assign an FRL value lower than the route’s lowest value. (Values equal to or greater than the route’s values allow data station users to access those routes.) A value of 0 is the most restrictive, and a value of 6 is the least restrictive. The factory setting is 3.

For example, to give an analog data station unlimited use of any ARS route, assign a value of 6. If you have digital data stations, assign a value of 0 to prevent users from inadvertently using ARS to select an analog line for outside data calls.

Planning Form Instructions

1. Using System Form 9b, Automatic Route Selection Tables and System Form 9c, ARS Default and Special Numbers Table, review the values assigned to the routes.
2. In the “Optional Features” section of Data Form 2a or 2b for each data station to record your decisions about Facility Restriction Level, do *one* of the following:

- Next to the “ARS Facility Restriction Level” heading, write the value (0 to 6) for the ARS Facility Restriction level you want to assign to each data station.
- Check “3” to keep the factory setting.

System Speed Dial Codes

To avoid giving the telephone number of a remote computer to modem pool users, assign a System Speed Dial code to the telephone number. Users can dial this 3-digit code to place data calls to the remote computer.

For data calls, the telephone number programmed for a Speed Dial code must include the access code (the pool dial-out code or the ARS dial-out code).

To specify that the remote computer’s telephone number does not appear on call reports, use the System Directory System Speed Dial instructions earlier in this book.

Data Hunt Groups

The Data Hunt Group feature is used to designate a group of either modems or 7500B Data Modules (not both) to receive calls in a modem pool or to communicate with a local host computer or workstation on a LAN. All modems or data modules in a data hunt group are assigned to a single extension number that is used both by inside and outside callers to reach the group. Individual trunks can be assigned to ring directly into the data hunt group to allow outside callers to use the modem pool.

Calls to the group are distributed among group members in a circular pattern. The system hunts for the first available modem or data module, starting with the one that received the last call. If all group members are unavailable, the caller hears a busy tone.

A data hunt group is the same as a voice-station calling group assigned using the Group Calling feature.

Consider grouping data stations in data hunt groups as shown in Figure 5-1:

- DHG #5 is assigned to the 7500B Data Modules used to communicate with the local host computer.
- DHG #6 is assigned to the modems used to communicate with the local host computer.
- DHG #7 is assigned to the 7500B Data Modules used to communicate with the workstation (gateway) on a LAN.
- DHG#8 is assigned to the modems used to communicate with the workstation (gateway) on a LAN.

Members of a data hunt group must be the same data station type—digital or analog. When you assign members of a modem pool to a data hunt group, be sure to assign only those members that are reached during the first stage of dialing. In an analog-to-digital modem pool, assign the modems to the data hunt group; in a digital-to-analog modem pool, assign the 7500B Data Modules to the data hunt group.

If you have a digital-to-analog modem pool on a dedicated outside trunk, you cannot place members of this type of modem pool in the same data hunt group as members of a modem pool that uses system lines. You can assign up to 32 data hunt groups or calling groups, or a combination of both types. Each data hunt group can have a maximum of 20 members and each data station can be a member of only one data hunt group.

You can also designate particular trunks or pools (Hybrid/PBX mode only) to ring directly into a data hunt group. However, incoming calls on a given trunk can be directed to only one data hunt group.

Extension numbers 770 through 791 and 7920 through 7929 are automatically reserved for calling groups and data hunt groups. If you want to change the extension numbers assigned to data hunt groups, see information about reassigning extension numbers described earlier in this book. The same considerations apply to data stations as those that apply to voice stations.

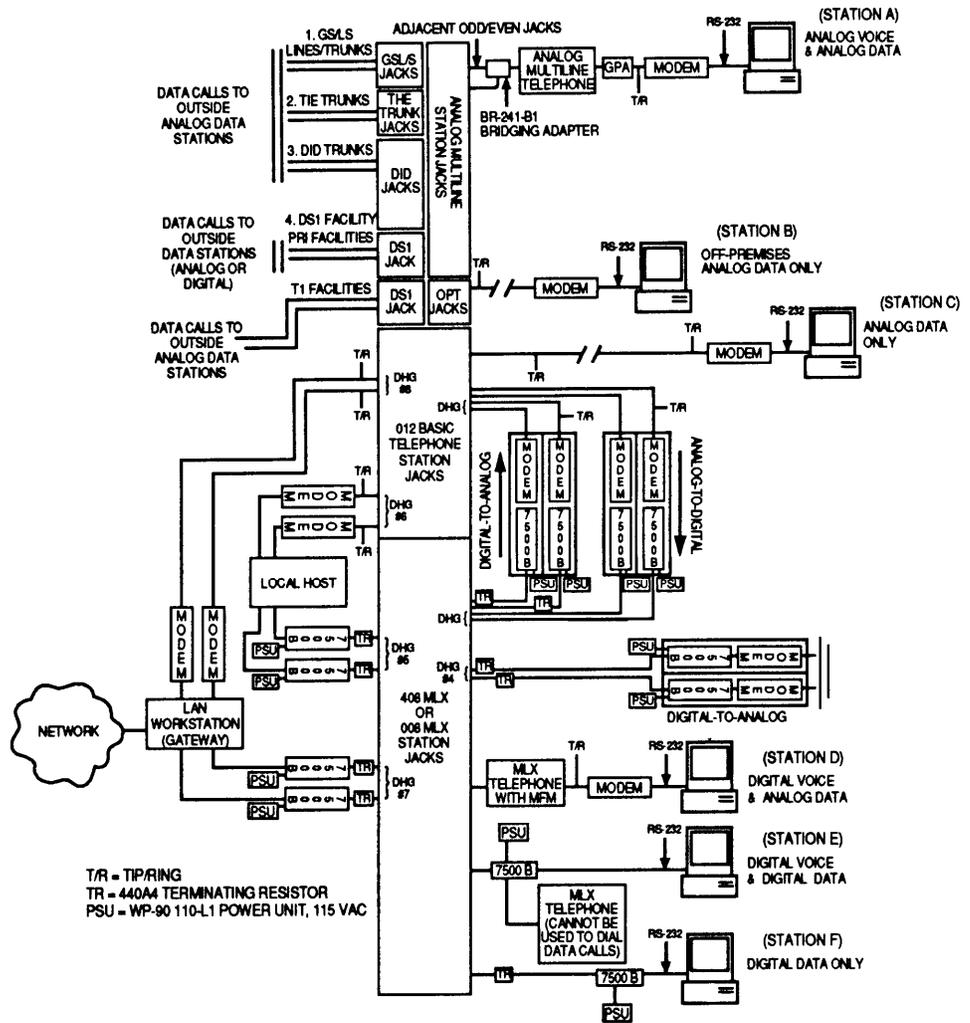


Figure 5-1. Data Hunt Groups

Forms Needed:

- **System Form 2a, System Numbering—Station Jacks**
- **System Form 2c, System Numbering—Trunk Jacks**
- (If the system has trunk pools-Hybrid/PBX mode only), **System Form 2c, System Numbering—Trunk Jacks**
- (If the system includes voice calling groups) **System Form 6e, Group Calling**
- (If you plan to renumber the factory-set extensions) **System Form 2d, System Numbering—Special Renumbers**

Planning Form Instructions

Duplicate enough copies of Data Form 3, Data Hunt Groups, for the number of data hunt groups you plan.

1. Write the group number in the “Group No.” space (1-32).
2. Write the name of the group in the “Group ID” space.
3. Check the box to indicate the group use: local host computer access, workstation on LAN access, Analog-to-Digital Modem Pool, or Digital-to-Analog Modem Pool.
4. Write the factory-set extension number for the data hunt group in the space provided.

NOTE:

Check all pages of System Form 6e to be sure that you have not assigned the extension to a voice calling group.

5. If you want to reassign the factory-set extension number for the data hunt group, write the new number in the “Renumber to” space.
Also write the new extension number you want to reassign in the calling group or data hunt group on System Form 2d, System Numbering—Special Renumber.
6. In the “Stations” area, write the extension number of each member of the group in the “Ext. No.” column and the name of the person or location in the “Person or Location” column.
7. In the “Trunks or Pools” area, for each trunk or pool that you want to ring directly into the data hunt group, write the trunk number or pool extension number next to the logical ID in the “Trunk or Pool No.” column. Refer to System Form 2b for the trunk numbers and to System Form 2c for the pool extension numbers.

In general, to modify the system you must perform the following tasks:

1. Decide what you want to change and identify the programming needed
2. Complete (or revise) the appropriate planning forms.
3. Program the modification using instructions in *System Programming*.

This chapter contains instructions for adding trunks, auxiliary equipment, or more extensions to an existing system. It includes the following:

- the actions you must take to add to the system
- the interrelated options or features you should consider
- the forms that must be revised or completed

References to the relevant sections of this and other books, where detailed instructions can be found, are included.

Preparation

The following tasks should be performed as preparation for modifying the system:

1. Collect your file of planning forms. Although you may need to revise only one or two forms, it is suggested that you have all completed forms available for reference.

NOTE:

If you need clean copies of the forms, see Appendix A of this book

2. Review Chapter 1 for details on preparation for planning activities.
3. Before revising the forms, analyze and document the modification planned. For example:
 - If adding stations to your system, revise the Floor Plan to show the location of the new telephones and the kind of equipment to be used.
 - If activating a feature such as System Speed Dial, survey employees to identify the numbers that should be programmed into the Speed Dial file.

Adding to the System

Adding to the system is defined as increasing its capacity or capability. This increase may mean adding more or different kinds of trunks, connecting auxiliary equipment, or installing more stations (telephones, consoles or tip/ring equipment).

Forms Needed:

- **System Form 1, System Planning**
- **System Form 2a, System Numbering—Station Jacks**
- **System Form 2c, System Numbering—Trunk Jacks**

Planning Form Instruction

1. Determine the specific type of trunk, auxiliary equipment, or station to be added.

Use Table 6-1 to determine the type of trunk and/or station module needed to support what you plan to add.

2. On System Form 1, System Planning, review the completed “Control Unit Diagram” on the back of the form and determine if the module type needed is present and do *one* of the following:
 - If the module is not in the control unit, skip to Step 4.
 - If the module type needed is already in the control unit, proceed to Step 3.

3. Determine if there are jacks available on the module for the new trunk, auxiliary equipment, or station by referring to System Form 2a, System Numbering—Station Jacks, or System Form 2c, System Numbering—Trunk Jacks and do *one* of the following:
 - If there are sufficient jacks available on an existing module, plan to connect the added trunk, equipment, or station to them. Skip to Step 6.
 - If there aren't jacks available, proceed to Step 4.
4. Plan the placement of the new module required to support the trunk, auxiliary equipment or station by reviewing the guidelines that follow and deciding where the new module should be placed.
 - The power supply module must be placed in the far left slot of each carrier.
 - The processor module must be installed in slot 0 of the basic carrier.
 - Trunk and/or station modules can be placed in any order in slots 1 through 17 (with two expansion carriers), with the following conditions:
 - Install the modules in each carrier from left to right with no empty slots between modules.
 - If the system includes a queued call console, the 008 MLX module that supports it must be the first station module in the control unit.
 - Place all 012 and 008 OPT modules in the same carrier whenever possible.
 - Group all 800 DID, 100D, and tie modules together whenever possible.

Table 6-1. Required Trunk and/or Station Modules

	100D	400 EM	400 LS/ TTR	400 GS/ LS TTR	800 DID	800 LS	008 OPT	800 GS/ LS	008 ATL	008 MLX	012	408 LS ATL	408 GS/ LS ATL	408 GS/ LS MLX
LS trunks														
GS trunks														
Tie trunks														
DID trunks														
T1 service														
Emulated LS trunks														
Emulated GS trunks														
Emulated tie trunks														
PRI services														
Remote Access														
Loudspeaker paging														
Maintenance Alarm														
Music-on-Hold														
MLXDLX														
QCC														
Analog DC														
MLX telephone														
Analog multiline telephone														
Tip/ring equipment														
Off-premises telephone														

NOTE:

- DS1 connectivity configured for T1 operation provide 24 channels.
- If you are planning for Remote Access, at least one module with touch-tone receivers must be installed.
- If analog multiline telephones require either Simultaneous Voice and Data or Voice Announce to Busy, two consecutive station jacks are required.
- If you are connecting tip/ring equipment to the 008 MLX or 408 GS/LS-MLX module, an MFM is required.
- If you are connecting tip/ring equipment to the 008, 408, or 408 GS/LS modules, a GPA is required.

5. Do *one* of the following:

- If the control unit has an available slot to the right, and the guidelines permit placement there, proceed to Step 6.
- If you must rearrange existing modules to accommodate the new one, skip to Step 7.

NOTE:

Placing additional modules in the control unit requires a recalculation of unit loads. For instructions, see *Equipment and Operations Reference*.

6. Revise or complete the required Planning Form(s) according to the directions shown in Tables 6-2, 6-3, and 6-4.

Table 6-2. Adding New Trunks

If adding	Complete
<ul style="list-style-type: none"> ■ Loop-start or ground-start trunks 	<p>All columns of Form 2c, System Numbering—Trunk Jacks</p>
<ul style="list-style-type: none"> ■ DS1 trunks 	<p>All columns of Form 2c, System Numbering—Trunk Jacks and Form 3b, Incoming Trunks—DS1 Connectivity(100D Module)</p>
<ul style="list-style-type: none"> ■ Tie trunks 	<p>All columns of Form 2c, System Numbering—Trunk Jacks and Form 3c, Incoming Trunks—Tie</p>
<ul style="list-style-type: none"> ■ DID trunks 	<p>All columns of Form 2c, System Numbering—Trunk Jacks and Form 3d, Incoming Trunks—DID</p> <p>Consider revisions to incoming trunks forms:</p> <ul style="list-style-type: none"> ■ 3a, Incoming Trunks—Remote Access <p>Consider revisions to feature forms:</p> <ul style="list-style-type: none"> ■ 2c, System Numbering—Trunk Jacks (labels) ■ 9a through 9c, Automatic Route Selection <p>Button Diagram on appropriate copies of Forms 4b, and 4d through 5b</p> <p>If personal line is assigned, consider Remote Call Forward</p>

Table 6-3. Adding Auxiliary Equipment

If adding	Complete
Maintenance Alarm	Form 2c, System
Music-on-Hold	Numbering — Trunk Jacks
Loudspeaker Paging	

If making more additions to the system, continue to Table 6-4.

Table 6-4. Adding New Stations

If adding	Complete
<ul style="list-style-type: none"> ■ New stations 	<p>All columns of Form 2a, System Numbering—Station Jacks</p> <p>Copy of appropriate telephone/operator Forms 4b and 4d through 5d</p> <p>Consider revisions to:</p> <ul style="list-style-type: none"> ■ Group Assigned Features (Forms 6b through 6e) ■ Allowed and Disallowed List assignments (Forms 6g and 6h) ■ Night Service assignments (Forms 7a and 7b) ■ Station Labels (Form 2a)
<ul style="list-style-type: none"> ■ Operator console 	<p>Consider revisions to:</p> <ul style="list-style-type: none"> ■ Operator Features (Form 6a) ■ Extension Status assignment (Form 6f)

7. If rearranging modules in the control unit, the numbering plan will revert to the factory-set two-digit plan. You must then reprogram the system:

- a. Obtain a blank set of planning forms from Appendix A.
- b. Locate the Equipment List (if available), the local telephone company trunk information list, the Floor Plan, and the analysis of the Employee Communications Survey forms. If any of these materials have been revised, you should have both the original and revised versions available.
- c. Work through this book, beginning with Chapter 2.

When you have completed modifying existing forms or completing new forms, you can program the modification(s) following the instructions contained in "System Programming."

This chapter contains information concerning upgrading the following:

- MERLIN® II Communications System to MERLIN LEGEND Communications System Release 1.0, 1.1, or 2.0
- MERLIN LEGEND Communications System Release 1.0 or 1.1 to Release 2.0.

Since the system planning forms from Release 1.0 have been revised for Release 2.0, this chapter also includes a table that shows how the previous forms correspond to the new forms. A description of the significant form changes is included in the “About This Book” section, earlier in this book.

Upgrading from a MERLIN II Communications System

While retaining most of the same capabilities of MERLIN II, feature operation in a MERLIN LEGEND Communications System (Release 1.0, 1.1, or 2.0) is quite different from its predecessor. Therefore, system programming and telephone programming must be completely reprogrammed. Likewise, although some of the MERLIN II hardware can be reused, there are incompatibilities that must be considered, and some additional hardware that must be installed.

Thus, the planning process for upgrading a MERLIN II system to MERLIN LEGEND Communications System Release 1.0, 1.1, or 2.0 must be as complete as though it were a new installation of the latter.

This section contains an overview of the upgrade process, including an overview of changes in feature operation, administration and programming, and applications. For additional information, see the *Equipment and Operations Reference*.

CAUTION:

Do **not** assume that Release 2.0 telephone and system features with the same name as in MERLIN II function in a similar manner. Also, most features work slightly differently depending on the type of telephone. For more information about feature operation, see the *Feature Reference*.

NOTE:

If the upgrade includes the addition of MERLIN MAIL, AUDIX Voice Power, or CMS, it is strongly recommended that the customer's trunks be converted from Loop-Start to Ground-Start trunks. For more information, refer to the application documentation.

Feature Operation

Feature operation in the MERLIN LEGEND Communications System is quite different from feature operation in MERLIN II, even in cases in which the feature name is similar or even the same. These differences include the following:

- A new mode of call handling, Hybrid/PBX mode, is now available which replaces the "Pooled System" configuration in MERLIN II with its two Button Access, Dial Access, or ARS buttons.
- There are major differences in how ARS is accessed (dial 9 versus two ARS buttons) and how it is programmed (Subpatterns, time of day, FRLs, 1+7 dialing, etc.)

- Conference and Transfer work differently.
- Phantom extensions cannot be programmed at virtual slots at the end of the carrier. Rather, phantom extensions can be programmed on unused ports of installed modules, especially adjunct ports on MI-X modules. In addition, using the Boards menu item in SPM, phantom modules can be installed and phantom extensions placed on those non-existent modules.
- Tie-line dialing acts like regular dialing and does not use a separate dialplan as in MERLIN II.
- Group Call Distribution has been replaced with Group Calling which significantly enhances the capabilities.

For more information about these and other features, see the *Feature Reference*.

Administration and Programming

Although programming system options continues to be performed using a menu-driven interface, significant changes have resulted from new features, new options for old features, new terminology, and the greater complexity of the system. In particular, be aware of the following:

- “Administration” is now called “System Programming.” “Programming,” “Button Programming,” and “Feature Programming” are now called “Extension Programming.”
- System and extension feature settings cannot be retained from a MERLIN II to a MERLIN LEGEND Communications System. The system must be reprogrammed using MERLIN LEGEND initial installation programming procedures.
- Most of the Dial Codes for Station Programming have changed in order to accommodate the many new features. A display interface is now available on all display telephones and through Centralized Programming that allows Extension Programming using menus without the need for codes.
- System Programming cannot be done on the MERLIN II System Display Console.
- System Programming from a station can only be done from an MLX-20L telephone plugged into one of the first five MLX ports in the system. By default, the first MLX port is assigned as the System Programming console, but this may be changed.
- System Programming may also be done from a PC with SPM software which is plugged into the Administration Port on the Control Unit.

For more detailed information about programming and administration, refer to the Release 2.0 *System Programming* guide.

Applications

Of the applications available with MERLIN II, the MERLIN Attendant, Call Accounting System, and Call Accounting Terminal applications may be reused when upgrading to the MERLIN LEGEND Communications System. MERLIN II Call Management System must be upgraded to the MERLIN LEGEND Call Management System; MERLIN MAIL Release 1 must be upgraded to MERLIN MAIL Release 2 or Integrated Solution III.

Table 7-1 lists the applications available with MERLIN II, including whether or not they are compatible with Release 2.0, and some additional information.

Table 7-1. Applications Compatibility

MERLIN II Application	Compatible with Release 2.0	Notes
Call Management System (CMS)	No	Must be upgraded. However, PC equipment, printer, CMS PC Expansion Card, and Voice Announcement Unit may be reused. Old CMS report files must be discarded. CMS configuration files may be kept but must be re-entered.
MERLIN Attendant	Yes	Release 2.0 planning forms should be completed to ensure proper installation. (NOTE: Using MERLIN Attendant or AT&T Attendant requires an 012 module which has an Apparatus Code 517C1 3 or later. Also, programming for AT&T Attendant must indicate that it is connected to a MERLIN LEGEND Communications System Release 2.0 instead of an AT&T Partner System,)
MERLIN MAIL Release 1.0	No	Must be upgraded to a Release 2.0 system or IS-III.
Call Accounting System (CAS) CAS/B CASIH	Yes	Must be programmed for the Basic Call SMDR Format.
Call Accounting Terminal (CAT) MERLIN CAT/B MERLIN II CAT/H	Yes	The MERLIN LEGEND Communications System must be programmed for the Basic Call SMDR Format. Also, the CAT may only accommodate a 2-digit dialplan.

For more information about applications, refer to the application documentation.

Upgrade Overview

The following is an overview of the tasks that must be performed to upgrade a MERLIN II system to a MERLIN LEGEND Communications System:

1. Make paper copies of all the MERLIN II translations available via Print Reports. (Paper copies are necessary because this information cannot be saved to a diskette and cannot be converted for direct use with the MERLIN LEGEND Communications System.)
2. Complete the appropriate planning forms for the MERLIN LEGEND Communications System.
3. Remove the MERLIN II Feature Module and replace it with the appropriate MERLIN LEGEND Communications System Feature Module.
4. Rearrange any of the other circuit modules based on the considerations described earlier in this book.
5. Program the system using the information on the planning forms.

Upgrading Release 1.0 and 1.1

This section contains an overview of the process to upgrade from Release 1.0 to Release 1.1 or to Release 2.0, and from Release 1.1 to Release 2.0. The actual procedure varies slightly, depending on the release *from which* and *to which* you are upgrading.

The new Convert feature available with Release 2.0 allows for easy and rapid upgrading from Release 1.0 and 1.1 to Release 2.0. The feature is accessed using SPM and is available in both DOS and UNIX® system versions.

Also included in this section is information about SPM programming compatibility and about planning for 2.0 enhancements.

For detailed upgrade information and procedures, see *System Programming and Maintenance (SPM)*.

Inter-Release Compatibility

It is important to understand compatibilities between files created on each of the different versions of SPM, not only for upgrading, but also for programming. Table 7-2 summarizes programming compatibility. (It is assumed that most of the programming is done in surrogate mode and backed up on disk.)

Table 7-2. Programming Compatibility

SPM Version	Program/ Backup on	Restore on		
		1.0	1.1	2.0
1.13	1.0	yes	yes	no
1.16	1.0	yes	yes	no
2.00	1.0	yes	yes	yes*
1.16	1.1	no	yes	no
2.00	1.1	no	no	yes*
2.00	2.0	no	no	yes

*The backup file must be converted before it is restored.

Upgrade Overview

An upgrade from Release 1.0 to 1.1 involves the following tasks:

1. Complete the appropriate planning forms as described in the next section, "Upgrade Planning."
2. Upgrade the SPM software.
3. Back up the Release 1.0 or Release 1.1 system programming using the Backup function on the SPM Main Menu.

NOTE:

Although the backup can be performed at any time prior to the upgrade process, it is recommended that it be performed immediately before upgrading so that the upgrade includes the latest programming changes.

4. Turn off the AC power on the control unit beginning with the basic carrier.
5. Unplug the interface cords from the SPM and SMDR printer ports on the processor module.
6. Remove the processor module.
7. Replace the feature module.
8. Reinstall the processor module.
9. Plug the interface cords into the SPM and SMDR printer ports on the processor module.
10. Turn on AC power to the control unit beginning with the last carrier.
11. Perform a frigid start.

12. **(Release 2.0 only)** Convert the backup file to Release 2.0 format by selecting the `Convert` option from the SPM Main Menu and following the instructions on the screen.
- 13 Restore the system programming by selecting the `Restore` function on the SPM Main Menu and the following backup file:
 - If you are upgrading to Release 1.1, use the backup file created in Step 3.
 - If you are upgrading to Release 2.0, use the converted backup file created in Step 12.

NOTE:

For this step, the SPM software must be Version 1.16 or later.

14. Program language selections other than the default, English, for the following:
 - System language
 - Language for individual extensions or blocks of extensions
 - System programming reports language
 - SMDR header language
 - Program the system for Release 2.0 enhancements.
15. Program new features using the planning forms completed in Step 1.

NOTE:

The system is **not** forced idle during the Backup or conversion process; the system is forced idle during the Restore process.

Upgrade Planning

Planning for upgrade involves determining which of the new enhancements will be implemented, and what settings, if any, will be programmed. Table 7-3 contains a list of enhancements that must be planned for if they are to function in the new system. The table includes the form on which you record the information for that feature, and the chapter in this book that contains instructions for filling out that form.

Detailed information about these and other enhancements is contained in *Feature Reference* and *Equipment and Operations Reference*.

Table 7-3. Planning for 2.0 Enhancements

Feature	Form	Chapter
Language selection (English, French, Spanish)	Form 1	Chapter 1
8102 and 8110 analog voice telephones	Form 4f	Chapters 3 and 4
Extension Copy feature	Forms 4a and 4c	Chapters 3 and 4
Integrated Administration	(See application documentation)	—
Coverage VMS feature	Forms 4b, 4d, 4e, 4f, 5a, 5b, 5c	Chapter 4
Calling Group as Night Service Group Assignment	Form 7a	Chapter 4
DID trunk emulation on T1 facility	Form 3b	Chapter 3
408 GS/LS-MLX module	Form 1	Chapter 2
Primary Rate Interface	Form 3b	Chapter 3

Release 1.0 vs. Release 2.0 Forms

This section contains a table that compares the Release 1.0 forms versus Release 2.0, indicating the revisions that have been made.

The following are some general revisions that have been made:

- Key System Planning and Hybrid/PBX System planning forms are combined; items for Hybrid/PBX mode only are shaded.
- Some forms have been combined, thus allowing the deletion of some forms.

Table 7-4. System Planning Forms

1.0 Form No.	2.0 Form No.	2.0 Form Title
N/A	N/A	Employee Communication Survey
1	1	System Planning
2a	2a	System Numbering—Station Jacks
2b	2b	System Numbering—Digital Adjuncts
2c	2c	System Numbering—Trunk Jacks
2d	2d	System Numbering—Special Renumbers
2e	—	(1.0 form Technician's Run Sheet now included in 2c)
3a	3a	Incoming Trunks—Remote Access
3b	—	(1.0 form Incoming Trunks—Pools now included in 2a)
3c	3b	Incoming Trunks—DSI Connectivity (100D Module)
3d	3c	Incoming Trunks—Tie
3e	3d	Incoming Trunks—DID
—	4a	Extension Copy—Analog Multiline Telephone Template (new form)
4a	4b	Analog Multiline Telephone
—	4c	Extension Copy—MLX Telephone Template (new form)
4b	4d	MLX Telephone
4b	4e	MFM Adjunct—MLX Telephone
4c	4f	Tip/Ring Equipment
5a	5a	Direct-Line Console (DLC)—Analog
5b	5b	Direct-Line Console (DLC)—Digital
5b	5c	MFM Adjunct—DLC
5c	5d	Queued Call Console (QCC)
6a	6a	Optional Operator Features
6b	6b	Call Pickup Groups
6c	6c	Group Paging
6d	6d	Group Coverage
6e	6e	Group Calling
6f	6f	System Features
6g	6g	Allowed Lists
6h	6h	Disallowed Lists
—	6i	Call Restriction Assignments and Lists (new form)
7a	7a	Night Service—Group Assignment
7b	7b	Night Service—Outward Restriction
7c	7c	Night Service—Time Set
8a	—	(1.0 form, Label Form—Trunks, now included on Form 2c)
8b	—	(1.0 form, Label Form—Stations and Calling Groups, now included on Form 2a)

Continued on next page

Table 7-4. - Continued

1.0 Form No.	2.0 Form No.	2.0 Form Title
8c	8a	Label Form—Posted Message
8d	8b	System Speed Dial
9a	9a	Automatic Route Selection Worksheet
9b	9b	Automatic Route Selection Tables
9c	9c	Automatic Route Selection Default and Special Numbers Tables

Appendix A: System Forms



This appendix contains one copy of the Employee Communication Survey form and one copy of each System Form. The forms are in numerical order and organized according to planning purpose as shown in Table A-1. It is recommended that you make copies of these forms and use the copies, keeping the originals for future use. Planning forms for data communications are contained in Appendix B. The T1/PRI Planner is contained in Appendix C.

Table A-1. System Forms

<u>Used for Planning</u>	<u>Form No.</u>	<u>Form Title</u>
Features and Calling Privileges	N/A	Employee Communication Survey
Control Unit Assembly and Operating Conditions	1	System Planning
System Component Numbering	2a	System Numbering—Station Jacks
	2b	System Numbering—Digital Adjuncts
	2c	System Numbering—Trunk Jacks
	2d	System Numbering—Special Renumbers
Incoming Trunk Connections	3a	Incoming Trunks—Remote Access
	3b	Incoming Trunks—DS1 Connectivity (100D Module)
	3c	Incoming Trunks—Tie
	3d	Incoming Trunks—DID
Station Connections	4a	Extension Copy—Analog Multiline Telephone Template
	4b	Analog Multiline Telephone
	4c	Extension Copy—MLX Telephone Template
	4d	MLX Telephone
	4e	MFM Adjunct—MLX Telephone
	4f	Tip/Ring Equipment
	5a	Direct-Line Console (DLC)—Analog
	5b	Direct-Line Console (DLC)—Digital
	5c	MFM Adjunct—DLC
	5d	Queued Call Console (QCC)
	6a	Optional Operator Features
	Features for Operators Features for User Groups	6b	Call Pickup Groups
6c		Group Paging
6d		Group Coverage
6e		Group Calling
Features for System-Wide Use	6f	System Features
	6g	Allowed Lists
	6h	Disallowed Lists
	6i	Call Restriction Assignments and Lists
	7a	Night Service—Group Assignment
	7b	Night Service—Outward Restriction
	7c	Night Service—Time Set
	8a	Label Form—Posted Message
	8b	System Speed Dial
9a	Automatic Route Selection Worksheet	
9b	Automatic Route Selection Tables	
9c	Automatic Route Selection Default and Special Numbers Tables	

Employee Communication Survey

Name _____ Room _____ Extension _____

Name of work group (Sales, Customer Service, etc.) _____

Please answer each question below.

1. Do you regularly use any of the following outside lines? (Check any that apply)

- WATS
- FX (foreign exchange)
- Tie
- None of the above or don't know

2. Are your phone calls covered when you're away from your desk?

- No
- Yes By whom? _____

3. Do you want your phone number to appear on another person's phone for screening, or covering calls, or for other reasons?

- No
- Yes Please list these people:

4. Do you cover phone calls for co-workers when they are away from their desks?

- No
- Yes For whom? _____

Which of those people should have a button on your phone used exclusively for his or her calls?

When you are unable to cover calls, it is done by _____

MERLIN LEGEND Communications System Release 2.0
Employee Communication Survey (Continued)

5. Is there a group of people with whom you share responsibilities such that it would be convenient if you could answer each other's calls?

No

Yes With whom? _____

6. Would you say your phone use is

Heavy

Average

Light

Do you need to handle more than two calls at a time?

If yes, how many? _____

7. Do you have a data terminal or personal computer at your workstation?

No Do you expect to get one within the next year?

No

Yes

8. Do you use account codes for charge-back of calls?

No

Yes Please list all the codes you use (attach another sheet if necessary):

9. Are there numbers that you and other people in your organization dial over and over every day?

No

Yes Please list these numbers:

10. Do you want to be able to pick up other people's calls when you hear their phones ring?

No

Yes Please list these people:

System Planning

Capacity

Trunks

Module Type	Number of Modules	Trunks Supported by Module	Total Trunks by Module Type
400 LS/TTR	x	4	
800 LS	x	8	
408 LS ATL	x	4	
400 GS/LS/TTR	x	4	
800 GS/LS	x	8	
408 ATL GS/LS	x	4	
408 GS/LS - MLX	x	4	
400EM	x	4	
800 DID*	x	8	
100D	x	24**	
System Totals			

*Hybrid/PBX mode only.

**The 100D module has one physical jack that supports 24 trunks.

Stations

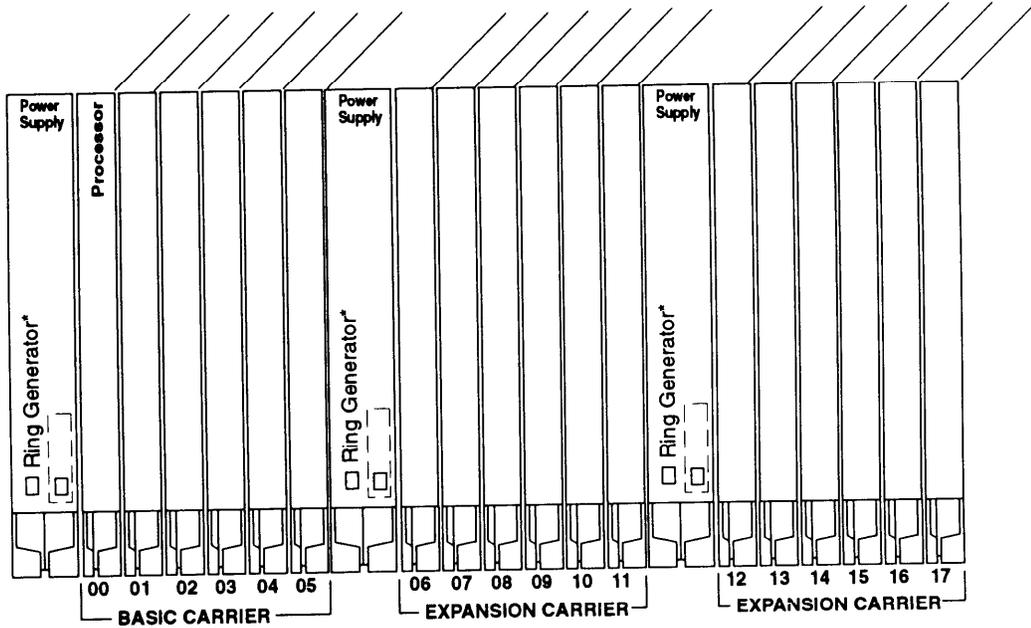
Module Type	Number of Modules	Physical Jacks per Module	Physical Jacks by Module Type	Extensions Assigned	Total Extensions Assigned
008 MLX	x	8	x	2	
008 ATL	x	8	x	1	
408 LS/ATL	x	8	x	1	
408 ATL GS/LS	x	8	x	1	
408 GS/LS - MLX	x	8	x	2	
012	x	12	x	1	
008 OPT	x	8	+	(_x4) †	
System Totals					

†The 008 OPT module is assigned 12 extension numbers although there are only 8 physical station jacks.

System Planning

Control Unit Diagram

Unit Load Total _____	Unit Load Total _____	Unit Load Total _____
Auxiliary Power Required	Auxiliary Power Required	Auxiliary Power Required
<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No



System Operating Conditions

Programming Equipment

- System Programming Console
 Logical ID ___ Ext. No. ___
- PC with SPM software

System Mode

- Key ◆
- Hybrid/PBX
- Behind Switch
- Host Dial Codes:
 - Transfer _____
 - Conference _____
 - Drop _____

Language Selection

- System:
- English ◆ French Spanish
- SMDR:
- English ◆ French Spanish
- Printer:
- English ◆ French Spanish

Automatic Maintenance Busy

- Enable
- Disable ◆

Set System Date

- Yes
- No

Set System Time

- Yes
- No

<p>System Consoles</p> <p><input type="checkbox"/> QCC (s)</p> <p>_____</p> <p><input type="checkbox"/> DLC (s)</p> <p>_____</p>

◆ Factory Setting

*Each carrier containing an 012 or 008 OPT module requires a Ring Generator.

Applications*

- Automated Document Delivery System
Notes: _____

- Call Accounting System (CAS)
Notes: _____

- Call Accounting Terminal (CAT)
 - Business
 - HospitalityNotes: _____

- Call Management System (CMS)
Notes: _____

- Centrex
Notes: _____

- CONVERSANT ® Intro
Notes: _____

- MERLIN ® Attendant
Notes: _____

- MERLIN MAIL™ Voice Messaging System
Notes: _____

- InnManager™ Guest Management System
Notes: _____

- MERLIN PFC™ Telephone
Notes: _____

*CAUTION: General information about these applications is in *Equipment and Operations*. But to ensure proper operation, you must review the documentation provided with the applications.

- MERLIN SmartConnect

Notes: _____

- System Programming and Maintenance (SPM)

Notes: _____

- Video Conferencing

Notes: _____

- IS-III

- IVP/Auto Attendant
- AUDIX Voice Power
- CAS
- SPM

Notes: _____

- IS-III

- IVP/Auto Attendant
- AUDIX Voice Power
- CAS
- SPM
- FAX Attendant System™
- Integrated Administration

Notes: _____

- Other

- _____
- _____
- _____
- _____

Notes: _____

System Form 2a

System Numbering—Station Jacks

Renumber System

2-Digit ♦ Selected Extension Numbers 3-Digit Set Up Space

Mod. Type	Log. ID	Jack Type			Eqpt.	2-Dig. Ext. No. ♦	3-Dig. Ext. No.	Set Up Space	Renumber to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
		A	D*	B										
	1					10	100	7100						
	2					11	101	7101						
	3					12	102	7102						
	4					13	103	7103						
	5					14	104	7104						
	6					15	105	7105						
	7					16	106	7106						
	8					17	107	7107						
	9					18	108	7108						
	10					19	109	7109						
	11					20	110	7110						
	12					21	111	7111						
	13					22	112	7112						
	14					23	113	7113						
	15					24	114	7114						
	16					25	115	7115						
	17					26	116	7116						
	18					27	117	7117						
	19					28	118	7118						
	20					29	119	7119						
	21					30	120	7120						
	22					31	121	7121						
	23					32	122	7122						
	24					33	123	7123						

Shaded lines indicate possible operator positions.
 ♦ Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Numbering - Station Jacks

Mod. Log. Type	Jack Type			Eqpt.	2-Dig. Ext. No.♦	3-Dig. Ext. No.	Set Up Space	Renumber to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
	A	D	B										
	25				34	124	7124						
	26				35	125	7125						
	27				36	126	7126						
	28				37	127	7127						
	29				38	128	7128						
	30				39	129	7129						
	31				40	130	7130						
	32				41	131	7131						
	33				42	132	7132						
	34				43	133	7133						
	35				44	134	7134						
	36				45	135	7135						
	37				46	136	7136						
	38				47	137	7137						
	39				48	138	7138						
	40				49	139	7139						
	41				50	140	7140						
	42				51	141	7141						
	43				52	142	7142						
	44				53	143	7143						
	45				54	144	7144						
	46				55	145	7145						
	47				56	146	7146						
	48				57	147	7147						

Shaded lines indicate possible operator positions.
 ♦ Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Numbering—Station Jacks

Mod. Type	Log. ID	Jack Type			Eqpt.	2-Dig. Ext. No. ♦	3-Dig. Ext. No.	Set Up Space	Renumbr to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
		A	D*	B										
	49					58	148	7148						
	50					59	149	7149						
	51					60	150	7150						
	52					61	151	7151						
	53					62	152	7152						
	54					63	153	7153						
	55					64	154	7154						
	56					65	155	7155						
	57					66	156	7156						
	58					67	157	7157						
	59					6800	158	7158						
	60					6801	159	7159						
	61					6802	160	7160						
	62					6803	161	7161						
	63					6804	162	7162						
	64					6805	163	7163						
	65					6806	164	7164						
	66					6807	165	7165						
	67					6808	166	7166						
	68					6809	167	7167						
	69					6810	168	7168						
	70					6811	169	7169						
	71					6812	170	7170						
	72					6813	171	7171						

Shaded lines indicate possible operator positions.
 * Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Form 2a (Continued)

System Numbering - Station Jacks

Mod. Type	Log. ID	Jack Type			Eqpt.	2-Dig. Ext. No. ♦	3-Dig. Ext. No.	Set Up Space	Renumbr to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
		A	D*	B										
	73				6814	172	7172		.....				
	74				6815	173	7173		.....				
	75				6816	174	7174		.....				
	76				6817	175	7175		.....				
	77				6818	176	7176		.....				
	78				6819	177	7177		.....				
	79				6820	178	7178		.....				
	80				6821	179	7179		.....				
	81				6822	180	7180		.....				
	82				6823	181	7181		.....				
	83				6824	182	7182		.....				
	84				6825	183	7183		.....				
	85				6826	184	7184		.....				
	86				6827	185	7185		.....				
	87				6828	186	7186		.....				
	88				6829	187	7187		.....				
	89				6830	188	7188		.....				
	90				6831	189	7189		.....				
	91				6832	190	7190		.....				
	92				6833	191	7191		.....				
	93				6834	192	7192		.....				
	94				6835	193	7193		.....				
	95				6836	194	7194		.....				
	96				6837	195	7195		.....				

Shaded lines indicate possible operator positions.
 * Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Numbering - Station Jacks

Mod. Type	Log. ID	Jack Type			Eqpt.	2-Dig. Ext. No. ♦	3-Dig. Ext. No.	Set Up Space	Renumber to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
		A	D*	B										
	97					6838	196	7196		.....			
	98					6839	197	7197		.....			
	99					6840	198	7198		.....			
	100					6841	199	7199		.....			
	101					6842	200	7200		.....			
	102					6843	201	7201		.....			
	103					6844	202	7202		.....			
	104					6845	203	7203		.....			
	105					6846	204	7204		.....			
	106					6847	205	7205		.....			
	107					6848	206	7206		.....			
	108					6849	207	7207		.....			
	109					6850	208	7208		.....			
	110					6851	209	7209		.....			
	111					6852	210	7210		.....			
	112					6853	211	7211		.....			
	113					6854	212	7212		.....			
	114					6855	213	7213		.....			
	115					6856	214	7214		.....			
	116					6857	215	7215		.....			
	117					6858	216	7216		.....			
	118					6859	217	7217		.....			
	119					6860	218	7218		.....			
	120					6861	219	7219		.....			

Shaded lines indicate possible operator positions.
 * Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Numbering - Station Jacks

Mod. Type	Log. ID	Jack Type			Eqpt.	2-Dig Ext. No. ♦	3-Dig. Ext. No.	Set Up Space	Renumber to	Label	Old Ext. No.	Wire No.	Person, Location, or Function	AUDIX Voice Power™
		A	D*	B										
	121				6862	220	7220							
	122				6863	221	7221							
	123				6864	222	7222							
	124				6865	223	7223							
	125				6866	224	7224							
	126				6867	225	7225							
	127				6868	226	7226							
	128				6869	227	7227							
	129				6870	228	7228							
	130				6871	229	7229							
	131				6872	230	7230							
	132				6873	231	7231							
	133				6874	232	7232							
	134				6875	233	7233							
	135				6876	234	7234							
	136				6877	235	7235							
	137				6878	236	7236							
	138				6879	237	7237							
	139				6880	238	7238							
	140				6881	239	7239							
	141				6882	240	7240							
	142				6883	241	7241							
	143				6884	242	7242							
	144				6885	243	7243							

Shaded lines indicate possible operator positions.
 * Use Form 2b for adjuncts connected via MFM or ISDN 7500B Data Module. ♦ Factory Setting

System Form 2c

System Numbering - Trunk Jacks

Maintenance Alarm, Trunk No. _____
 Loop-Start Reliable Disconnect*
 No Yes

Music-on-Hold, Trunk No. _____ Source _____
 Loudspeaker Page, Trunk No(s). _____

Module Type and Slot No.	Jack Type (LS, GS, Log. DID, Tie, etc.)	Trunk No.	Pool Dial-Out Code††	Re-number To	Incoming Trunk Type (Main No., Personal Line, WATS, FX, etc.)	Telephone Number or Equipment	Label	Outmode Signaling		Toll Type Prefix Req'd for LD		Hold Disc. Interval		QCC Queue Priority Level† (4 ♦)	QCC Operator to Receive Callist (No ♦)	Function
								TT♦	R	Yes♦	No	Short	Long ♦			
1		801					.....								
2		802					.....								
3		803					.....								
4		804					.....								
5		805					.....								
6		806					.....								
7		807					.....								
8		808					.....								
9		809					.....								
10		810					.....								
11		811					.....								
12		812					.....								
13		813					.....								
14		814					.....								
15		815					.....								
16		816					.....								
17		817					.....								
18		818					.....								
19		819					.....								
20		820					.....								

♦ Factory Setting
 * If the system has AUDIX Voice Power/FAX Attendant System™, Integrated Administration will automatically set Loop-Start Reliable Disconnect to "Yes."
 † Hybrid/PBX mode only.
 ‡ Maximum: 11 pools with up to 80 trunks per pool.
 Factory settings: 70 (main), 891 (dial-in tie), 892 (automatic-in tie).

System Form 2c (Continued)

System Numbering - Trunk Jacks

Module Type and Slot No.	Jack Type (LS, GS, DID, Tie, etc.)	Trunk No.	Pool Dial-Out Code†	Re-number To	Incoming Trunk Type (Main No., Personal Line, WATS, FX, etc.)	Telephone Number or Equipment	Label	Outmode Signaling		Toll Type Prefix Req'd for LD			Hold Disc. Interval			QCC Queue Priority Level† (4 ⇄)	QCC Operator to Receive Call† (No ⇄)	Function
								TT ⇄	IR	Yes ⇄	No	Short	Long ⇄					
		21	821				.....										
		22	822				.....										
		23	823				.....										
		24	824				.....										
		25	825				.....										
		26	826				.....										
		27	827				.....										
		28	828				.....										
		29	829				.....										
		30	830				.....										
		31	831				.....										
		32	832				.....										
		33	833				.....										
		34	834				.....										
		35	835				.....										
		36	836				.....										
		37	837				.....										
		38	838				.....										
		39	839				.....										
		40	840				.....										

◆ Factory Setting
 † Hybrid/PBX mode only.
 ‡ Maximum: 11 pools with up to 80 trunks per pool.
 Factory settings: 70 (main), 891 (dial-in tie), 892 (automatic-in tie).

System Numbering - Trunk Jacks

Module Type and Slot No.	Log. ID	Jack Type (LS, GS, DID, Tie, etc.)	Trunk No.	Pool Dial-Out Code†	Re-number To	Incoming Trunk Type (Main No., Personal Line, WATS, FX, etc.)	Telephone Number or Equipment	Label	Outmode Signaling			Toll Type Prefix Req'd for LD			Hold Disc. Interval	QCC Queue Priority Level‡ (4 ⇄)	QCC Operator to Receive Call§ (No ⇄)	Function
									TT⇄	R	Yes⇄	No	Short	Long ⇄				
	41		841					.....									
	42		842					.....									
	43		843					.....									
	44		844					.....									
	45		845					.....									
	46		846					.....									
	47		847					.....									
	48		848					.....									
	49		849					.....									
	50		850					.....									
	51		851					.....									
	52		852					.....									
	53		853					.....									
	54		854					.....									
	55		855					.....									
	56		856					.....									
	57		857					.....									
	58		858					.....									
	59		859					.....									
	60		860					.....									

‡ Maximum: 11 pools with up to 80 trunks per pool.
 Factory settings: 70 (main), 891 (dial-in tie), 892 (automatic-in tie).

◆ Factory Setting
 † Hybrid/PBX mode only.

System Numbering - Trunk Jacks

Module Type and Slot No.	Log. ID	Jack Type (LS, GS, DID, Tie, etc.)	Trunk No.	Pool Dial-Out Code††	Re-number To	Incoming Trunk Type (Main No., Personal Line, WATS, FX, etc.)	Telephone Number or Equipment	Label	Outmode Signaling		Toll Type Prefix Req'd for LD		Hold Disc. Interval		QCC Queue Priority Level† (4 ⇄)	QCC Operator to Receive Calls† (No ⇄)	Function
									TT⇄	R	Yes⇄	No	Short	Long ⇄			
	61		861					.....								
	62		862					.....								
	63		863					.....								
	64		864					.....								
	65		865					.....								
	66		866					.....								
	67		867					.....								
	68		868					.....								
	69		869					.....								
	70		870					.....								
	71		871					.....								
	72		872					.....								
	73		873					.....								
	74		874					.....								
	75		875					.....								
	76		876					.....								
	77		877					.....								
	78		878					.....								
	79		879					.....								
	80		880					.....								

◆ Factory Setting
 † Hybrid/PBX mode only.
 † Maximum: 11 pools with up to 80 trunks per pool.
 Factory settings: 70 (main), 891 (dial-in tie), 892 (automatic-in tie).

System Form 2d

System Numbering - Special Renumbers

Pools * (Form 2c) Description	Factory-Set Number	Renumber to
	70	
	890	
	891	
	892	
	893	
	894	
	895	
	896	
	897	
	898	
	899	

Group Paging (Form 6c) Group ID	Factory-Set Number	Renumber to
	793	
	794	
	795	
	796	
	797	
	798	
	799	

Call Park (Form 6a)	Factory-Set Number	Renumber to
	881	
	882	
	883	
	884	
	885	
	886	
	887	
	888	

Remote Access Code (Form 3a)	Factory-Set Number	Renumber to
	889	

Group Calling (Form 6e) Group ID Label	Factory-Set Number	Renumber to
| | | | |	770	
| | | | |	771	
| | | | |	772	
| | | | |	773	
| | | | |	774	
| | | | |	775	
| | | | |	776	
| | | | |	777	
| | | | |	778	
| | | | |	779	
| | | | |	780	
| | | | |	781	
| | | | |	782	
| | | | |	783	
| | | | |	784	
| | | | |	785	
| | | | |	786	
| | | | |	787	
| | | | |	788	
| | | | |	789	
| | | | |	790	
| | | | |	791	
| | | | |	7920	
| | | | |	7921	
| | | | |	7922	
| | | | |	7923	
| | | | |	7924**	
| | | | |	7925**	
| | | | |	7926**	
| | | | |	7927**	
| | | | |	7928**	
| | | | |	7929**	

Listed Directory Number* (QCC Queue)	Factory-Set Number	Renumber to
	800	

*Hybrid/PBX mode only.

**Reserved for AUDIX Voice Power/FAX Attendant System.

Class of Restriction without Barrier Codes

DID* and Tie Trunks

Restriction

- Unrestricted
- Outward Restrict ♦
- Toll Restrict

ARS Restriction Level*

- | | |
|------------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 |
| <input type="checkbox"/> 3 ♦ | |

Allowed List Access

- List Numbers (0 - 7)

____ _
____ _

Disallowed List Access

- List Numbers (0 - 7)

____ _
____ _

Non-Tie Trunks

Restriction

- Unrestricted
- Outward Restrict ♦
- Toll Restrict

ARS Restriction Level*

- | | |
|------------------------------|----------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 |
| <input type="checkbox"/> 3 ♦ | |

Allowed List Access

- List Numbers (0 - 7)

____ _
____ _

Disallowed List Access

- List Numbers (0 - 7)

____ _
____ _

♦ Factory Setting
*Hybrid/PBX mode only

Class of Restriction with Barrier Codes

Maximum: 16 barrier codes. (Make copies if more than 4 are assigned.)

Barrier Code
 Number _____
 Digits _____ (4 digits, 0 - 9)

Restriction
 Unrestricted
 Outward Restrict ◆
 Toll Restrict

ARS Restriction Level*
 0 4
 1 5
 2 6
 3 ◆

Allowed List Access
 List Numbers (0 - 7)

Disallowed List Access
 List Numbers (0 - 7)

Barrier Code
 Number _____
 Digits _____ (4 digits, 0 - 9)

Restriction
 Unrestricted
 Outward Restrict ◆
 Toll Restrict

ARS Restriction Level*
 0 4
 1 5
 2 6
 3 ◆

Allowed List Access
 List Numbers (0 - 7)

Disallowed List Access
 List Numbers (0 - 7)

Barrier Code
 Number _____
 Digits _____ (4 digits, 0 - 9)

Restriction
 Unrestricted
 Outward Restrict ◆
 Toll Restrict

ARS Restriction Level*
 0 4
 1 5
 2 6
 3 ◆

Allowed List Access
 List Numbers (0 - 7)

Disallowed List Access
 List Numbers (0 - 7)

Barrier Code
 Number _____
 Digits _____ (4 digits, 0 - 9)

Restriction
 Unrestricted
 Outward Restrict ◆
 Toll Restrict

ARS Restriction Level*
 0 4
 1 5
 2 6
 3 ◆

Allowed List Access
 List Numbers (0 - 7)

Disallowed List Access
 List Numbers (0 - 7)

◆ Factory Setting
 *Hybrid/PBX mode only

Incoming Trunks - DS1 Connectivity (100D Module)

Module 1 Slot No. _____

<p>Type of Service</p> <p><input type="checkbox"/> T1 ♦ *</p> <p><input type="checkbox"/> PRI**</p> <p>T1 Trunks</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Trunk Type</th> <th rowspan="2">Channel Number(s)</th> <th colspan="2">For TIE/All TIE</th> </tr> <tr> <th>TIE-PBX</th> <th>Toll</th> </tr> </thead> <tbody> <tr><td>Ground Start</td><td></td><td></td><td></td></tr> <tr><td>Loop Start</td><td></td><td></td><td></td></tr> <tr><td>TIE</td><td></td><td></td><td></td></tr> <tr><td>Unequipped</td><td></td><td></td><td></td></tr> <tr><td>All Ground Start</td><td></td><td></td><td></td></tr> <tr><td>All Loop Start</td><td></td><td></td><td></td></tr> <tr><td>All TIE</td><td></td><td></td><td></td></tr> <tr><td>All Unequipped</td><td></td><td></td><td></td></tr> <tr><td>DID</td><td></td><td></td><td></td></tr> <tr><td>All DID</td><td></td><td></td><td></td></tr> </tbody> </table> <p>Frame Format</p> <p><input type="checkbox"/> D4 Compatible ♦</p> <p><input type="checkbox"/> Extended Super Frame (ESF)</p>	Trunk Type	Channel Number(s)	For TIE/All TIE		TIE-PBX	Toll	Ground Start				Loop Start				TIE				Unequipped				All Ground Start				All Loop Start				All TIE				All Unequipped				DID				All DID				<p>Suppression (Line Code)</p> <p><input type="checkbox"/> AMI-ZCS ♦</p> <p><input type="checkbox"/> B8ZS</p> <p>Signaling Mode</p> <p><input type="checkbox"/> Robbed Bit Signaling (RBS) ♦</p> <p><input type="checkbox"/> Common Channel Signaling (CCS)</p> <p>Line Compensation</p> <p style="text-align: center;">_____ Cable Feet</p> <p><input type="checkbox"/> 1 ♦ (.6 dB)</p> <p><input type="checkbox"/> 2 (1.2 dB)</p> <p><input type="checkbox"/> 3 (1.8 dB)</p> <p><input type="checkbox"/> 4 (2.4 dB)</p> <p><input type="checkbox"/> 5 (3.0 dB)</p>	<p>Clock Synchronization</p> <p>Priority</p> <p><input type="checkbox"/> Primary ♦</p> <p><input type="checkbox"/> Secondary</p> <p><input type="checkbox"/> Tertiary</p> <p><input type="checkbox"/> None</p> <p>Source</p> <p><input type="checkbox"/> Loop ♦</p> <p><input type="checkbox"/> Local</p> <p>Activation</p> <p><input type="checkbox"/> Active ♦</p> <p><input type="checkbox"/> Not Active</p> <p>Channel Service Unit</p> <p><input type="checkbox"/> Foreign Exchange ♦</p> <p><input type="checkbox"/> Special Access</p>
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Module 2 Slot No. _____

<p>Type of Service</p> <p><input type="checkbox"/> T1 ♦ *</p> <p><input type="checkbox"/> PRI**</p> <p>T1 Trunks</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Trunk Type</th> <th rowspan="2">Channel Number(s)</th> <th colspan="2">For TIE/All TIE</th> </tr> <tr> <th>TIE-PBX</th> <th>Toll</th> </tr> </thead> <tbody> <tr><td>Ground Start</td><td></td><td></td><td></td></tr> <tr><td>Loop Start</td><td></td><td></td><td></td></tr> <tr><td>TIE</td><td></td><td></td><td></td></tr> <tr><td>Unequipped</td><td></td><td></td><td></td></tr> <tr><td>All Ground Start</td><td></td><td></td><td></td></tr> <tr><td>All Loop Start</td><td></td><td></td><td></td></tr> <tr><td>All TIE</td><td></td><td></td><td></td></tr> <tr><td>All Unequipped</td><td></td><td></td><td></td></tr> <tr><td>DID</td><td></td><td></td><td></td></tr> <tr><td>All DID</td><td></td><td></td><td></td></tr> </tbody> </table> <p>Frame Format</p> <p><input type="checkbox"/> D4 Compatible ♦</p> <p><input type="checkbox"/> Extended Super Frame (ESF)</p>	Trunk Type	Channel Number(s)	For TIE/All TIE		TIE-PBX	Toll	Ground Start				Loop Start				TIE				Unequipped				All Ground Start				All Loop Start				All TIE				All Unequipped				DID				All DID				<p>Suppression (Line Code)</p> <p><input type="checkbox"/> AMI-ZCS ♦</p> <p><input type="checkbox"/> B8ZS</p> <p>Signaling Mode</p> <p><input type="checkbox"/> Robbed Bit Signaling (RBS) ♦</p> <p><input type="checkbox"/> Common Channel Signaling (CCS)</p> <p>Line Compensation</p> <p style="text-align: center;">_____ Cable Feet</p> <p><input type="checkbox"/> 1 ♦ (.6 dB)</p> <p><input type="checkbox"/> 2 (1.2 dB)</p> <p><input type="checkbox"/> 3 (1.8 dB)</p> <p><input type="checkbox"/> 4 (2.4 dB)</p> <p><input type="checkbox"/> 5 (3.0 dB)</p>	<p>Clock Synchronization</p> <p>Priority</p> <p><input type="checkbox"/> Primary</p> <p><input type="checkbox"/> Secondary</p> <p><input type="checkbox"/> Tertiary</p> <p><input type="checkbox"/> None</p> <p>Source</p> <p><input type="checkbox"/> Loop ♦</p> <p><input type="checkbox"/> Local</p> <p>Activation</p> <p><input type="checkbox"/> Active ♦</p> <p><input type="checkbox"/> Not Active</p> <p>Channel Service Unit</p> <p><input type="checkbox"/> Foreign Exchange ♦</p> <p><input type="checkbox"/> Special Access</p>
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♦ Factory Setting

*The factory setting of "T1" is not automatically selected if you enter nothing; it must be entered.

** "PRI" must be selected as the "Type" of DS 1 connectivity before PRI options are entered.

Module 3 Slot No. _____

<p>Type of Service</p> <p><input type="checkbox"/> T1 ♦ *</p> <p><input type="checkbox"/> PRI**</p> <p>T1 Trunks</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Trunk Type</th> <th rowspan="2">Channel Number(s)</th> <th colspan="2">For TIE/All TIE</th> </tr> <tr> <th>TIE-PBX</th> <th>Toll</th> </tr> </thead> <tbody> <tr><td>Ground Start</td><td></td><td></td><td></td></tr> <tr><td>Loop Start</td><td></td><td></td><td></td></tr> <tr><td>TIE</td><td></td><td></td><td></td></tr> <tr><td>Unequipped</td><td></td><td></td><td></td></tr> <tr><td>All Ground Start</td><td></td><td></td><td></td></tr> <tr><td>All Loop Start</td><td></td><td></td><td></td></tr> <tr><td>All TIE</td><td></td><td></td><td></td></tr> <tr><td>All Unequipped</td><td></td><td></td><td></td></tr> <tr><td>DID</td><td></td><td></td><td></td></tr> <tr><td>All DID</td><td></td><td></td><td></td></tr> </tbody> </table>	Trunk Type	Channel Number(s)	For TIE/All TIE		TIE-PBX	Toll	Ground Start				Loop Start				TIE				Unequipped				All Ground Start				All Loop Start				All TIE				All Unequipped				DID				All DID				<p>Suppression (Line Code)</p> <p><input type="checkbox"/> AMI-ZCS ♦</p> <p><input type="checkbox"/> B8ZS</p> <p>Signaling Mode</p> <p><input type="checkbox"/> Robbed Bit Signaling (RBS) ♦</p> <p><input type="checkbox"/> Common Channel Signaling (CCS)</p> <p>Line Compensation</p> <p style="text-align: center;">Cable Feet</p> <p><input type="checkbox"/> 1 ♦ (.6 dB)</p> <p><input type="checkbox"/> 2 (1.2 dB)</p> <p><input type="checkbox"/> 3 (1.8 dB)</p> <p><input type="checkbox"/> 4 (2.4 dB)</p> <p><input type="checkbox"/> 5 (3.0 dB)</p>	<p>Clock Synchronization</p> <p>Priority</p> <p><input type="checkbox"/> Primary</p> <p><input type="checkbox"/> Secondary</p> <p><input type="checkbox"/> Tertiary</p> <p><input type="checkbox"/> None</p> <p>Source</p> <p><input type="checkbox"/> Loop ♦</p> <p><input type="checkbox"/> Local</p> <p>Activation</p> <p><input type="checkbox"/> Active ♦</p> <p><input type="checkbox"/> Not Active</p> <p>Channel Service Unit</p> <p><input type="checkbox"/> Foreign Exchange ♦</p> <p><input type="checkbox"/> Special Access</p>
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♦ Factory Setting

*The factory setting of **T1" is **not** automaticaly selected if you enter nothing; it must be entered.

** "PRI" must be selected as the "Type" of DS1 connectivity before PRI options are entered.

Dial Plan Routing (Incoming Services)*

Maximum: 16 entries

Entry No.	0	1	2	3	4	5	6	7
Service**								
Pattern to match†								
Total Digits in dialed number (0 - 14)								
Delete Digits (0 - 14)								
Add Digits (0 -4)								

Entry No.	8	9	10	11	12	13	14	15
Service**								
Pattern to match†								
Total Digits in dialed number (0 - 14)								
Delete Digits (0 - 14)								
Add Digits (0 - 4)								

* Hybrid/PBX mode only.

** Services:

AT&T Toll: Megacom WATS, Megacom 800, ACCUNET® SDS, Software Defined Network (SDN), MULTIQUEST Long Distance.

Local: OUTWATS, 56/64 Digital, Virtual private Network, INWATS.

Other All services, Other, No service.

† Pattern of up to 8 digits.

Outgoing Tables (Outgoing Services)

Network Selection Table

Maximum: 4 entries

Entry No.	0 ♦	1 ♦	2	3
Dial Prefix*	101***	10***		

Special Services Table

Maximum: 8 entries

Entry No.	0	1	2	3	4	5	6	7
Pattern to match**	011	010	01	00	0	1		
Operator †	none	OP	OP	OP/P	OP	none		
Type of No. (N= Nat'l; I=Int'l)	I	I	I	N	N	N		
Delete Digits (0 - 4)	3	3	2	2	1	1		

♦ Defaults.

* Dial Pattern can be up to 8 digits (*is a wildcard); must include at least one number; cannot begin with*.

** Pattern can be up to 4 digits; no asterisks(*)

† Operator: Local Operator (OP), Presubscribed Carrier (P), No operator (none).

Call-By-Call Service Table

Maximum: 10 entries

Entry No.	0	1	2	3	4
Pattern to match (up to 10 entries)					
Call type (Voice/Data/Both)					
Service*					
Delete Digits (0 - 8)					

Entry No.	5	6	7	8	9
Pattern to match (up to 10 entries)					
Call type (Voice/Data/Both)					
Service*					
Delete Digits (0 - 8)					

* Services:
 AT&T Toll: Megacom WATS, ACCUNET® SDS, Software Defined Network(SDN), Long Distance.
 Local: OUTWATS, 56/64 Digital, Virtual Private Network.
 Other: Other, No service.

Test Telephone Numbers

Module 1: _____ **Module 2:** _____ **Module 3:** _____

PRI Protocol

Timers and Counters

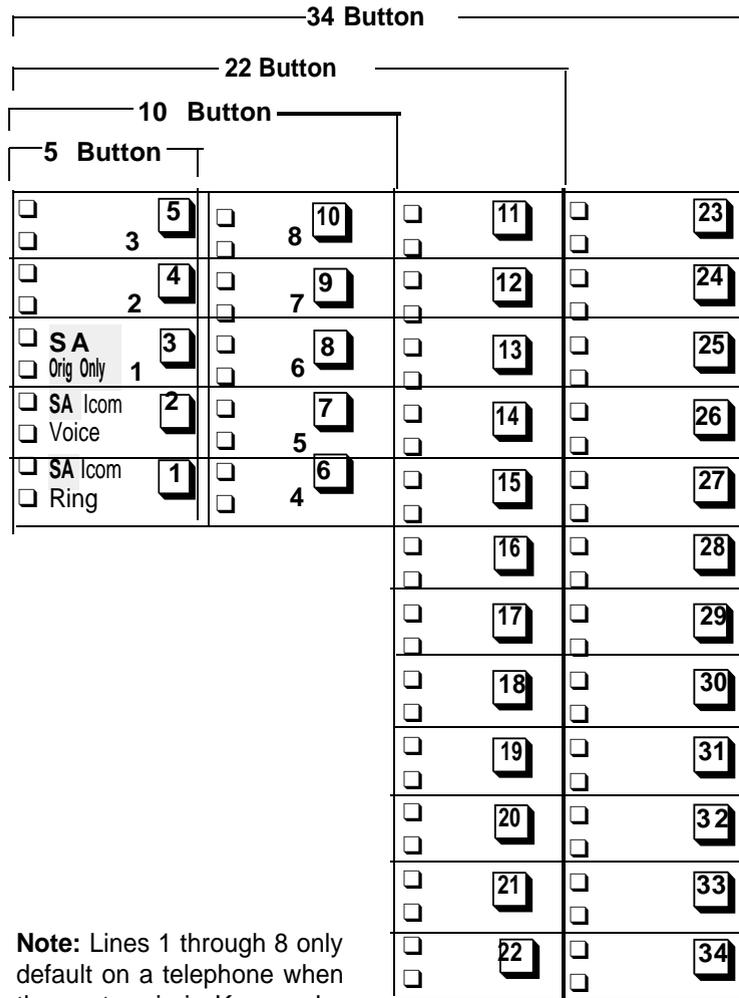
	Factory Setting	Change To
T200 Timer	1 second	(1000 - 3000 ms)
T203 Timer	30 seconds	(1 - 60 seconds)
N200 Counter	3 transmissions	(1 - 5 transmissions)
N201 Counter	260 octets	(16 - 260 octets)
K Counter	7 frames	(1 - 15 frames)
T303 Timer	4 seconds	(4 - 12 seconds)
T305 Timer	4 seconds	(4 - 30 seconds)
T308 Timer	4 seconds	(4 - 12 seconds)
T309 Timer	90 seconds	(30 - 120 seconds)
T310 Timer	10 seconds	(2 - 10 seconds)
T313 Timer	4 seconds	(4 - 12 seconds)
T316 Timer	120 seconds	(3 - 120 seconds)

Terminal Equipment Identifier (TEI)

- 0 ♦
- _____ (1 - 63)

♦ *Factory Setting*

Button Diagram



Note: Lines 1 through 8 only default on a telephone when the system is in Key mode.

Analog Multiline Telephone

(Make a copy of this form for each telephone.)

Logical ID _____ Extension No. _____ Person or Location _____

Copied from Master Ext. No. _____

Station Jack Pair

- Voice Announce to Busy (voice/voice)
- Simultaneous Voice and Data (voice/data)

Even-numbered jack

Logical ID _____ Ext. No. _____

Telephone Model

- MLC-5 BIS-22D
- BIS-10 BIS-34
- BIS- 22 BIS-34D
- Other _____

Adjuncts

- General Purpose Adapter
 - FAX machine
 - Answering machine
 - Data terminal
 - Other _____
- Supplemental Alert Adapter
 - Alert device type _____
- Headset
- Headset adapter
- Hands-free unit
- Hearing-impaired handset
- Noisy environment
- Off Premise
- Other _____

Assigned Features

Pool Dial-Out Code Restriction*

- Unrestricted from following codes**

- Restricted from following codes†

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)

- Disallowed List(s)

ARS Restriction Level*

- 3 ♦
- ____ (0 - 6)

Personal Lines

Principal User of Personal Line

Trunk No. (801-880) _____
Tel. No. _____

Shared Extension No. _____

- Ring
- No Ring

Auto Line Selection

Language

- English ♦
- French
- Spanish

♦ Factory Setting

*Hybrid/PBX mode only.

**Factory setting is unrestricted for all codes.

† Pool dial-out code restrictions must be programmed.

System Form 4b (Continued)

Optional Features

Abbreviated Ring

- Off ♦
- On

Auto Callback

- Off ♦
- On

AUDIX Voice Power Subscriber

- Yes, Auto Dial button # _____
- No

Call Pickup Group

- No
- Yes, Group No. _____

Call Waiting

- Off ♦
- On

Forced Account Code Entry

- No ♦
- Yes

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ♦
- Allowed

Voice-Announced Calls

- On ♦
- Off

Coverage

Individual Coverage Receivers

Primary receivers

Secondary receivers

Group Coverage

- No ♦
- Yes, Group No. _____

Coverage Inside

- Off ♦
- On

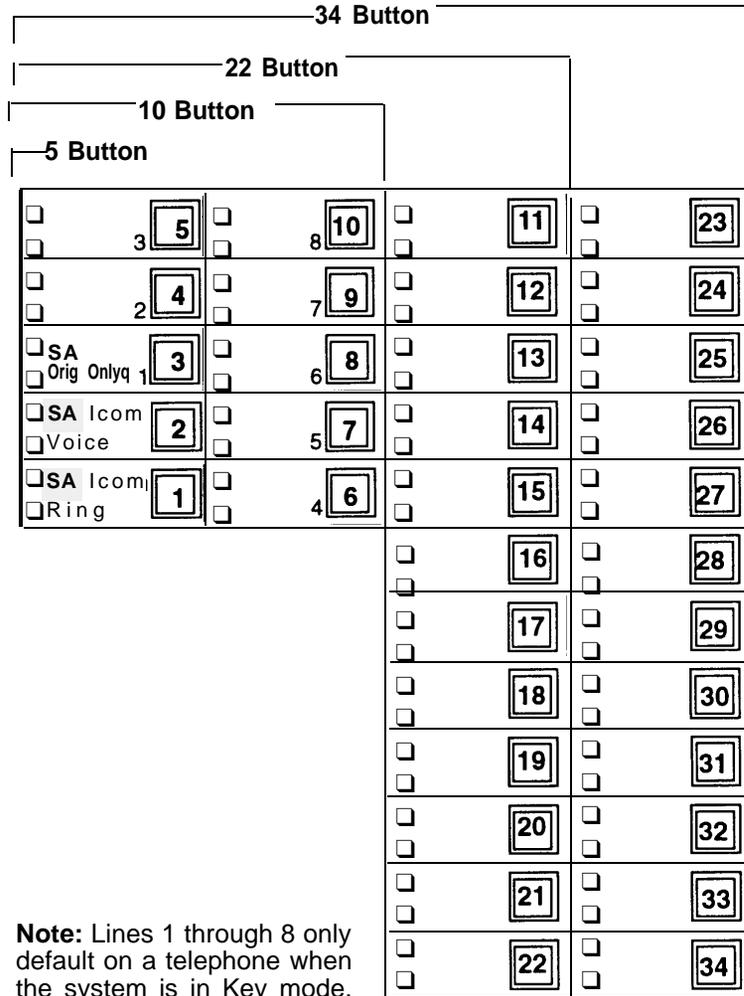
Coverage VMS

- Off ♦
- No

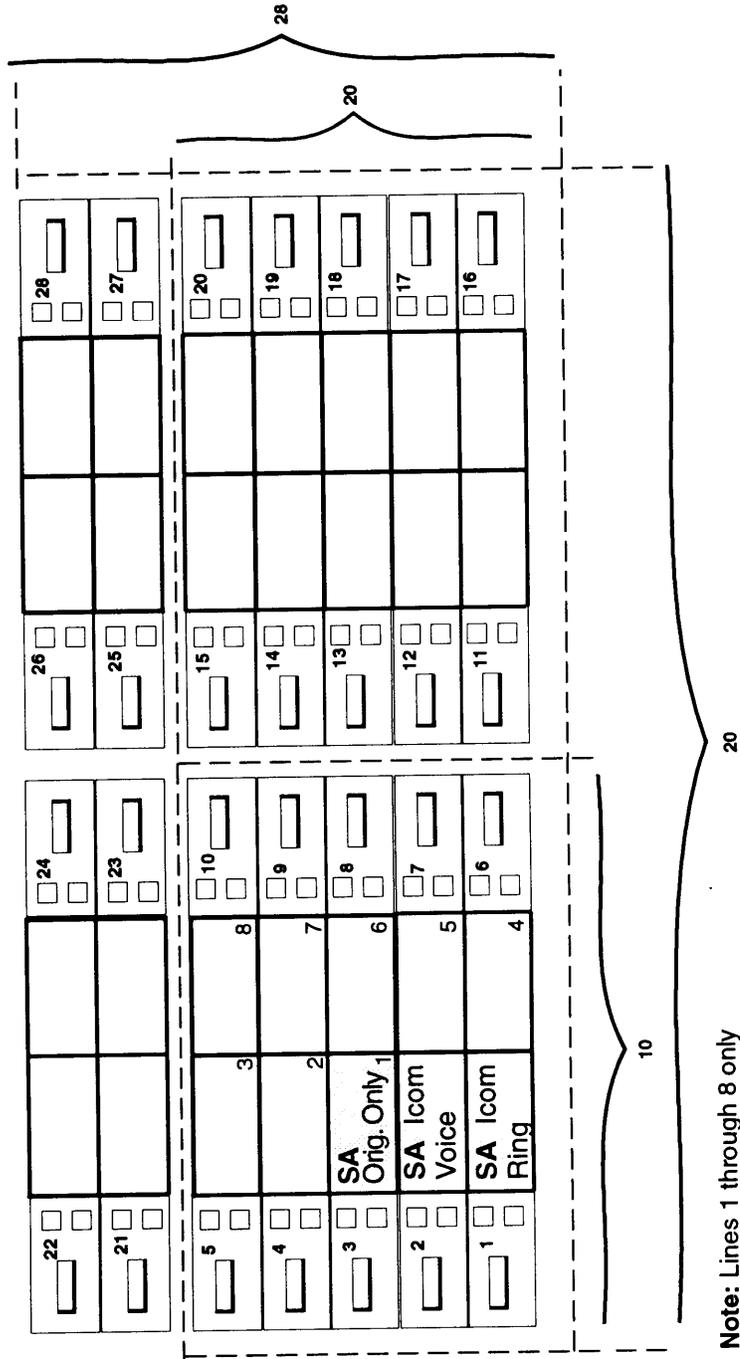
♦ *Factory Setting*

Button Diagram

See Master Extension



Button Diagram



Note: Lines 1 through 8 only default on a telephone when the system is in Key mode.

System Form 4d

MLX Telephone

(Make a copy of this form for each telephone.)

Logical ID _____ Extension No. _____ Person or Location _____

- Copied from Master Ext. No. _____
- Wall Mount (MLX-10 and MLX-10D only)

Telephone Model

- MLX-20L TM
- MLX-28D TM
- MLX-10D TM
- MLX-10 TM

Adjuncts

- Headset
- Hearing-impaired handset
- Noisy environment
- Multi-Function Module (MFM) Extension No. _____
 - FAX machine
 - Answering machine
 - Data terminal
 - Alert device, type _____
 - Other _____
- Off Premise

Assigned Features

Pool Dial-Out Code Restriction*

- Unrestricted from following codes**
 - _____
 - _____
- Restricted from following codes†
 - _____
 - _____

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)
 - _____
 - _____
- Disallowed List(s)
 - _____
 - _____

ARS Restriction Level*

- 3 ♦
- _____ (0 -6)

Personal Lines

Principal User of Personal Line

Trunk No. (801-880) _____
Tel. No. _____

Shared Extension No. _____

- Ring
- No Ring

Auto Line Selection

Language

- English ♦
- French
- Spanish

♦ Factory Setting

* Hybrid/PBX mode only.

** Factory setting is unrestricted for all codes.

† Pool dial-out code restrictions must be programmed.

System Form 4d (Continued)

Optional Features

Abbreviated Ring

- Off ♦
- On

Auto Callback

- Off ♦
- On

AUDIX Voice Power Subscriber

- Yes, Auto Dial button # _____
- No

Call Pickup Group

- No
- Yes, Group No. _____

Call Waiting

- Off ♦
- On

Forced Account Code Entry

- No ♦
- Yes

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Microphone Operation

- Enable ♦
- Disable

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ♦
- Allowed

Voice-Announced Calls

- On ♦
- Off

Coverage

Individual Coverage Receivers

Primary receivers

____ _

Secondary receivers

____ _

Group Coverage

- No ♦
- Yes, Group No. _____

Coverage Inside

- Off ♦
- On

Coverage VMS

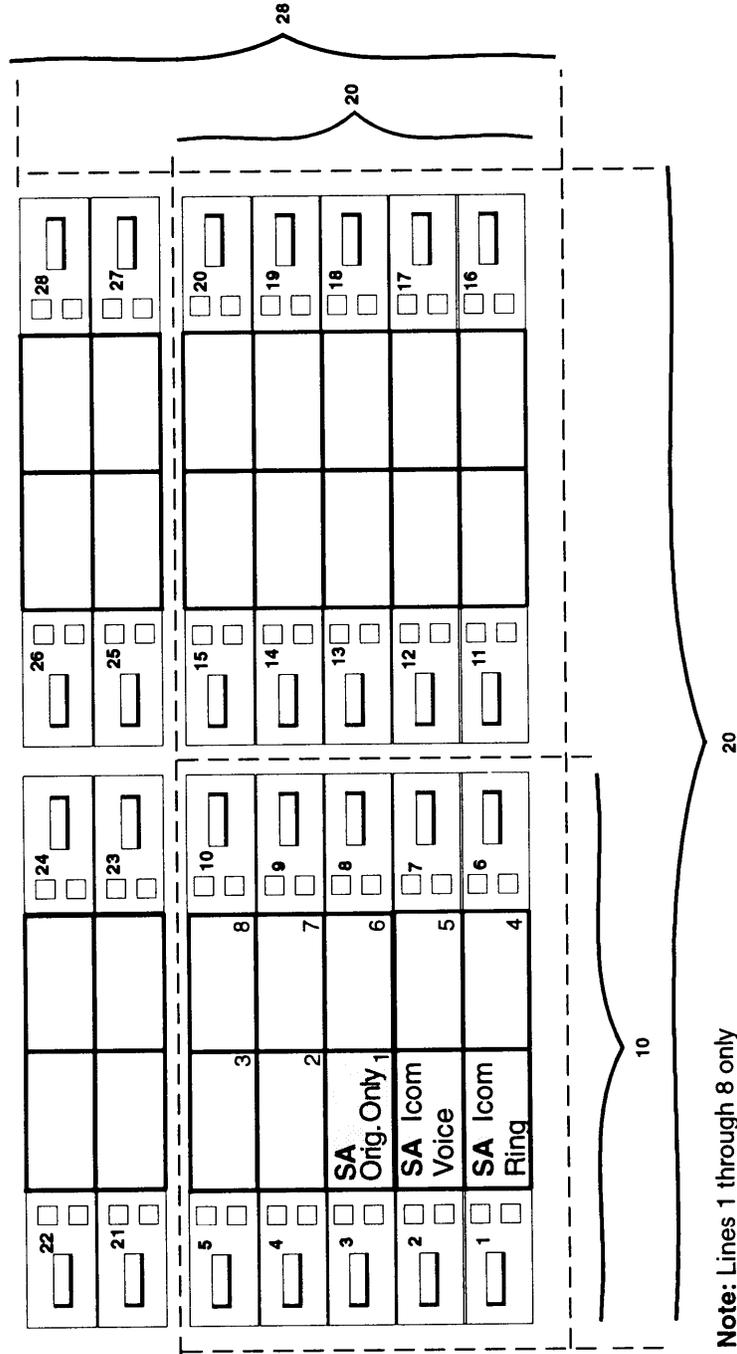
- Off ♦
- On

♦ *Factory Setting*

System Form 4d (Continued)

Button Diagram

See Master Extension



MFM Adjunct — MLX Telephone

Extension No. _____ Person or Location _____

Connected to MLX extension No. _____

Adjuncts

- FAX machine
- Answering machine
 - Used as delay announcement device for calling groups
Ext. No. _____
- Data terminal
- Alert device, type _____
 - Used as Calls-in-Queue Alarm device for calling groups
Ext. No. _____
- Other _____

Assigned Features

- Pool Dial-Out Code Restriction***
- Unrestricted from following codes**

 - Restricted from following codes†

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)

- Disallowed List(s)

- ARS Restriction Level***
- 3 ♦
 - _____ (0 - 6)

Button Diagram

Copied from Master Extension No.

Line 3	5	Line 8	10
Line 2	4	Line 7	9
Line 1	3	Line 6	8
SA Orig. Only			
SA Icom	2	Line 5	7
Voice			
SA Icom	1	Line 4	6
Ring			

Note: Lines 1 through 8 only default on a telephone when the system is in Key mode.

- Centralized Programming Requirements**
- Disable Voice Announce-change button 2 assignment to System Access Originate Only and remove button 3 assignment
 - Enable Ringing/Idle Line Preference
 - Change Automatic Line Selection order to: (1) System Access Ring, (2) System Access Originate Only, (3) outside trunks assigned to buttons 3 through 10
 - Set ringing Option to No Ring for each personal line on which calls are **not** received

Principal User of Personal Line

Trunk No. (801-880) _____

Tel. No. _____

Auto Line Selection

♦ Factory Setting
 *Hybrid/PBX mode only
 ** Factory setting is unrestricted for all codes.
 † Pool dial-out code restrictions must be programmed.

Optional Features

AUDIX Voice Power Subscriber

- Yes, Auto Dial button # _____
- No

Auto Callback

- Off ♦
- On

Call Pickup Group

- No
- Yes, Group No. _____

Call Waiting

- Off ♦
- On

Forced Account Code Entry

- No ♦
- Yes

FAX Machine Features

FAX Machine Receiver

- No ♦
- Extension No. _____

FAX Message Threshold

- 10 seconds ♦
- _____ seconds (0 - 30)

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ♦
- Allowed

Coverage

Individual Coverage Receivers

Primary receivers

Secondary receivers

Coverage Inside

- Off ♦
- On

♦ Factory Setting

Tip/Ring Equipment

(Make a copy of this form for each device.)

Logical ID _____ Extension No. _____ Person or Location _____

Type

- Single-line telephone
- Answering machine
 - Used as delay announcement device for calling groups
Ext. No. _____

- FAX machine
- Other _____

Adjuncts

- Speakerphone
- Hearing-impaired handset
- Noisy environment
- Off Premise

Assigned Featured

Pool Dial-Out Code Restriction*

- Unrestricted from following codes**

- Restricted from following codes†

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)

- Disallowed List(s)

ARS Restriction Level*

- 3 ♦
- _____ (0-6)

Principal User of Personal Line

Trunk No. (801-880) _____
Tel. No. _____

Auto Line Selection

Button Diagram

Line 3	5	Line 8	10
Line 2	4	Line 7	9
Line 1	3	Line 6	8
SA Orig. Only			
SA Icom Ring	2	Line 5	7
S A Icom Ring	1	Line 4	6

♦ Factory Setting
 *Hybrid/PBX mode only
 ** Factory setting is unrestricted for all codes.
 † Pool dial-out code restrictions must be programmed.

System Form 4f (Continued)

Optional Features

AUDIX Voice Power Subscriber

Yes, Auto Dial button # _____

No

Auto Callback

Off **◆**

On

Call Pickup Group

No

Yes, Group No. _____

Call Waiting

Off **◆**

On

Forced Account Code Entry

No **◆**

Yes

FAX Machine Features

FAX Machine Receiver

No **◆**

Extension No. _____

FAX Message Threshold

10 seconds **◆**

_____ seconds (0- 30)

Messag-Waiting Receiver

FAX machine at

Extension No. _____

Page Group

No

Yes, Group No. _____

Remote Call Forward

Not allowed **◆**

Allowed

Coverage

Individual Covage Receivers

Primary receivers

Secondary receivers

Coverage Inside

Off **◆**

On

◆ *Factory Setting*

System Form 5a

Direct-Line Console (DLC) - Analog

(Make a copy of this form for each telephone.)

Logical ID _____ Extension No. _____ Person or Location _____

Copied from Master Ext. No. _____

Station Jack Pair

- Voice Announce to Busy (voice/voice)
- Simultaneous Voice and Data (voice/data)

Even-numbered jack

Logical ID _____ Ext. No. _____

Console Model

- MERLIN II System Display Console
- BIS-34D
- BIS-34
- BIS-22

Adjuncts

- General Purpose Adapter
 - FAX machine
 - Answering machine
 - Data terminal
 - Other _____
- Supplemental Station Alert Adapter
 - Alert Device type _____
- Headset
- Headset adapter
- Hearing-impaired handset
- Noisy environment
- Other _____

Assigned Features

Pool Dial-Out Code Restriction*

Unrestricted from following codes**

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Restricted from following codes †

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Disallowed List(s)

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

ARS Restriction Level*

- 3 ♦
- ____ (0 -6)

Personal Lines

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Principal User of Personal Line

Trunk No. (801-880) _____

Tel. No. _____

Auto Line Selection

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Language

- English ♦
- French
- Spanish

♦ Factory Setting
 *Hybrid/PBX mode only.
 **Factory setting is unrestricted for all codes.
 † Pool dial-out code restrictions must be programmed.

System Form 5a (Continued)

Optional Features

Abbreviated Ring

- Off ♦
- On

Auto Callback

- Off ♦
- On

AUDIX Voice Power Subscriber

- Yes, Auto Dial button # _____
- No

Call Pickup

- No ♦
- Yes, Group No. _____

Call Waiting

- Off ♦
- On

Calling Group

- No
- Yes, Group No. _____

Forced Account Code Entry

- No ♦
- Yes

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ♦
- Allowed

Voice-Announced Calls

- On ♦
- Off

Coverage

Individual Coverage Receivers

Primary receivers

Secondary receivers

Group Coverage

- No ♦
- Yes, Group No. _____

Coverage Inside

- Off ♦
- On

Coverage VMS

- Off ♦
- On

Extension Status

- No ♦
- Yes

♦ Factory Setting

System Form 5b

Direct-Line Console (DLC) - Digital

(Make a copy of this form for each console.)

Logical ID _____ Extension No. _____ Person or Location _____

Copied from Master Ext. No. _____

Console Model

MLX-20L™

MLX-28D™

Adjuncts

Direct Station Selector
Number (1 or 2) _____

Multi-Function Module (MFM) Extension No. _____

FAX machine

Answering machine

Data terminal

Alert device
type _____

Other _____

Headset

Hearing-impaired handset

Noisy environment

Assigned Features

Pool Dial-Out Code Restriction*

Unrestricted from following codes**

____ _

Restricted from following codes†

____ _

Call Restriction

Unrestricted ◆

Outward Restrict

Toll Restrict

Allowed List(s)
____ _

Disallowed List(s)
____ _

ARS Restriction Level*

3 ◆

____ (0-6)

Personal Lines

____ _

Principal User of Personal Line

Trunk No. (801-880) _____

Tel. No. _____

Auto Line Selection

____ _

Language

English ◆

French

Spanish

Optional Features

Abbreviated Ring

Off ◆

On

Auto Callback

Off ◆

On

AUDIX Voice Power Subscriber

Yes, Auto Dial button # _____

No

Call Pickup Group

No

Yes, Group No. _____

Call Waiting

Off

On

◆ Factory Setting

*Hybrid/PBX mode only.

**Factory setting is unrestricted for all codes.

† Pool dial-out code restrictions must be programmed.

Forced Account Code Entry

- No ♦
- Yes

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Microphone Operation

- Enable ♦
- Disable

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ♦
- Allowed

Voice-Announced Calls

- On ♦
- Off

Coverage

Individual Coverage Receivers

Primary receivers

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Secondary receivers

____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Group Coverage

- No ♦
- Yes, Group No. _____

Coverage Inside

- Off ♦
- On

Coverage VMS

- Off ♦
- On

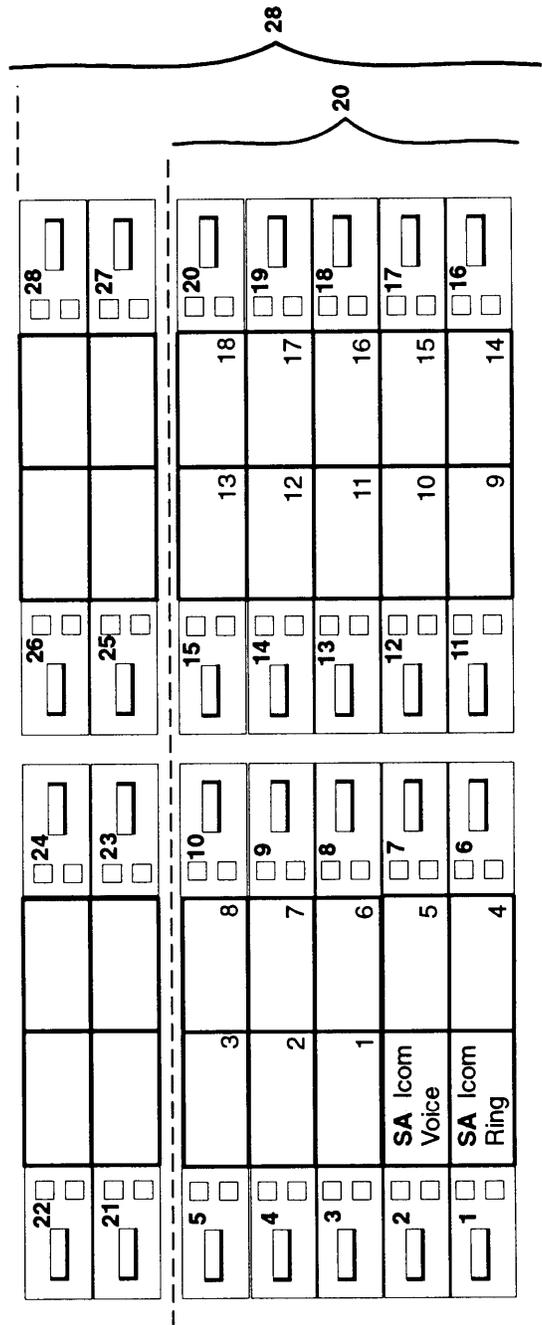
Extension Status

- No ♦
- Yes

♦ *Factory Setting*

Button Diagram

See Master Extension



Assignment of outside trunks to console buttons begins with number 3.

MFM Adjunct - DLC

Extension No. _____ Person or Location _____

Connected to MLX extension No. _____

Adjuncts

- FAX machine
- Answering machine
 - Used as delay announcement device for calling groups
Ext. No. _____

- Data terminal
- Alert device, type _____
 - Use as Calls-in-Queue Alarm device for calling groups
Ext. No. _____
- Other _____

Button Diagram

- Copied from Master Extension No. _____

Line 3	Line 8
Line 2	Line 7
Line 1 SA Orig. Only	Line 6
SA Icom Voice	Line 5
SA Icom Ring	Line 4

Note: Lines 1 through 8 only default on a telephone when the system is in Key mode.

Assigned Features

- Pool Dial-Out Code Restriction***
- Unrestricted from following codes**
____ _
____ _
 - Restricted from following codes†
____ _
____ _

Call Restriction

- Unrestricted ♦
- Outward Restrict
- Toll Restrict
- Allowed List(s)
____ _
____ _
- Disallowed List(s)
____ _
____ _

ARS Restriction Level*

- 3 ♦
- ____ (0 - 6)

Centralized Programming Requirements

- Disable Voice Announce – change button 2 assignment to System Access Originate Only and remove button 3 assignment
- Enable Ringing/Idle Line Preference
- Change Automatic Line Selection order to:
(1) System Access Ring, (2) System Access Originate Only, (3) outside trunks assigned to buttons 3 through 10
- Set Ringing Option to No Ring for each personal line on which calls are not received

Principal User of Personal Line

Trunk No. (801-880) _____

Tel. No. _____

Auto Line Selection

____ _
____ _

♦ Factory Setting
 *Hybrid/PBX mode only
 **Factory setting is unrestricted for all codes
 † Pool dial-out code restrictions must be programmed.

Optional Features

AUDIX Voice Power Subscriber

- Yes, Auto Dial button # _____
- No

Auto Callback

- Off ◆
- On

Call Pickup Group

- No
- Yes, Group No. _____

Call Waiting

- Off ◆
- On

Forced Account Code Entry

- No ◆
- Yes

FAX Machine Features

FAX Machine Receiver

- No ◆
- Extension No. _____

FAX Message Threshold

- 10 seconds ◆
- ____ second (0 - 30)

Messages-Waiting Receiver

- FAX machine at
Extension No. _____

Page Group

- No
- Yes, Group No. _____

Remote Call Forward

- Not allowed ◆
- Allowed

Coverage

Individual Coverage Receivers

Primary receivers
____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Secondary receivers
____ _ ____ _ ____ _ ____ _
____ _ ____ _ ____ _ ____ _

Coverage Inside

- Off ◆
- On

◆ Factory Setting

System Form 5d

Queued Call Console (QCC)*

(Make a copy of this form for each console.)

Logical ID _____ Extension No. _____ Person or Location _____

Adjuncts

- Direct station selector
- Number (1 or 2) _____
- Headset
- Hearing-impaired handset
- Noisy environment

Message Center Operator

- No
- Yes

Assigned Features

Pool Dial-Out Code Restriction

- Unrestricted from following codes**

____ _
____ _

- Restricted from following codes†

____ _
____ _

Call Restriction

- Unrestricted ◆
- Outward Restrict
- Toll Restrict
- Allowed List(s)

____ _
____ _

- Disallowed List(s)

____ _
____ _

Language ‡

- English ◆
- French
- Spanish

Optional Features

Call Pickup Group

- No
- Yes, Group No. _____

Forced Account Code Entry

- No ◆
- Yes

Message-Waiting Receiver

- FAX machine at
Extension No. _____

Page Group

- No
- Yes, Group No. _____

◆ Factory Setting

*Hybrid/PBX mode only.

**Factory setting is unrestricted for all codes.

† Pool dial-out code restrictions must be programmed.

‡ Language selection is set through system programming.

Button Diagram

<input type="checkbox"/> 5 <input type="checkbox"/>	<input type="checkbox"/> 10 <input type="checkbox"/>	<input type="checkbox"/> 15 <input type="checkbox"/>	<input type="checkbox"/> 20 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G CALL 5	H POSITION BUSY	I ALARM	J FORCED RELEASE	K CALL 4	L SEND/REMOVE MSG	M NIGHT SERVICE	N POOL STATUS
<input type="checkbox"/> 4 <input type="checkbox"/>	<input type="checkbox"/> 9 <input type="checkbox"/>	<input type="checkbox"/> 14 <input type="checkbox"/>	<input type="checkbox"/> 19 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O CALL 3	P HEADSET MUTE	Q HEADSET STATUS	R HEADSET AUTO ANSWER	S CALL 2	T SOURCE	U DESTINATION	V JOIN
<input type="checkbox"/> 3 <input type="checkbox"/>	<input type="checkbox"/> 8 <input type="checkbox"/>	<input type="checkbox"/> 13 <input type="checkbox"/>	<input type="checkbox"/> 18 <input type="checkbox"/>	<input type="checkbox"/> 7 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 2 <input type="checkbox"/>	<input type="checkbox"/> 7 <input type="checkbox"/>	<input type="checkbox"/> 12 <input type="checkbox"/>	<input type="checkbox"/> 17 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
W CALL 1	X START	Y RELEASE	Z CANCEL	<input type="checkbox"/> 6 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> 1 <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Optional Operator Features

Direct-Line console

Operator Hold Timer

- 60 seconds ♦
- _____ seconds (10 - 255)

DLC Automatic Hold

- Disable ♦
- Enable

Queued Call Console*

Hold Return

- Remain on hold ♦
- Return to queue

Message Center

- No
- Yes, Operator Extension No. _____

Automatic Hold or Release

- Automatic Release ♦
- Automatic Hold

Extended Call Completion

- Automatic completion ♦
- Manual completion

Queue Over Threshold

- 0 calls ♦ (operators not notified when calls are in queue)
- _____ calls (1 - 99)

Return Ring

- 4 rings+
- _____ rings(1 - 15)

Elevate Priority

- 0 seconds ♦ (calls are not automatically reprioritized)
- _____ seconds (5 - 30)

Position Busy Backup

- No ♦
- Yes, Extension no. of calling group backup _____

Calls-in-Queue Alert

- Disable ♦
- Enable, Operator Extension No(s).

Operator Hold Timer

- 60 seconds ♦
- _____ seconds (10 - 255)

Direct Station Selector

Page Buttons

Page Button	1	2	3
Beginning extension for range			

Enter first extension number for range of 50 (1 DSS) or 100 (2 DSSs) extensions for each Page button.

Call Park Codes

Factory-Set Extension No.	Renumber to	Factory-Set Extension No.	Renumber to
881		885	
882		886	
883		887	
884		888	

♦ Factory Setting
 *Hybrid/PBX mode only

Call Types*

Call Types	QCC Operator to Receive Calls	QCC Queue Priority Level (4♦)
Dial 0		
Call Follow/Forward	N/A	
Unassigned DID		
Listed Directory Number		
QCC Extension	N/A	
Returning		

Group Coverage Calls

Group No.	QCC Operator to Receive Calls	QCC Queue Priority Level (4♦)	Group No.	QCC Operator to Receive Calls	QCC Queue Priority Level (4♦)
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		

♦ Factory Setting
 *Hybnd/PBX mode only

Call Pickup Groups

Maximum: 30 groups. (Make additional copies if more than 8 groups are assigned.)

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Number _____		
Group ID _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Group Paging

Group No. 1 Group ID _____		
Factory-Set Ext. No. 793 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group No. 2 Group ID _____		
Factory-Set Ext. No. 794 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group No. 3 Group ID _____		
Factory-Set Ext. No. 795 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group No. 4 Group ID _____		
Factory-Set Ext. No. 796 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group Paging

Group No. 5 Group ID _____		
Factory-Set Ext. No. 797 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group No. 6 Group ID _____		
Factory-Set Ext. No. 798 Renumber to _____		
	Ext. No.	Person or Location
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Group No. 7 Page All
Factory-Set Ext. No. 799 Renumber to _____

Group Number _____

Group ID _____

Ext. No. _____

Calling Group Options*

Hunt Type

- Circular ◆
- Linear

Delay Announcement

- No ◆
- Yes, Extension No. _____

Message-Waiting Receiver

- No ◆
- Yes, Extension No. _____

Calls-in-Queue Alarm Threshold

- 1 call ◆
- _____ calls (2 - 99)

External Alert for Calls-in-Queue Alarm

- No ◆
- Yes, Extension No. _____

Overflow Coverage

- No ◆
- Yes, Calling Group No. _____
- Yes, QCC LDN (queue) Extension No. _____

Overflow Threshold

- 1 call ◆
- _____ calls (2 - 99)

Group Type

- Auto Login
- Auto Logout ◆
- Integrated VMI
- Generic VMI

Coverage Group Receiver

- No
- Yes, Group No. _____
(See Form 6d.)

**If the system has AUDIX Voice Power/FAX Attendant System, you do not need to fill in this information- settings will be automatically set by Integrated Administration to defaults assumed by the A AUDIX Voice Power system (and not necessarily those listed on this form). Changing the assumed defaults could affect how the AUDIX Voice Power system works. If you change them, DO SO WITH CAUTION, and record the settings on this form. For more information, see the A AUDIX Voice Power documentation.*

System Features

Transfer Options

Return Time Interval

- 4 rings ♦
- 0 rings
- ____ rings (1 - 9)*

One-Touch Call Handling

- One-Touch Transfer ♦
 - Manual Completion
 - Automatic Completion ♦
- One-Touch-Hold

Transfer Audible

- Music-on-Hold ♦
- Ringback

Type of Transfer

- Voice button
- Ring button ♦

Camp-On Return Time

- 90 seconds ♦
- ____ seconds (30 - 300)

Call Park Return Time

- 180 seconds ♦
- ____ seconds (30 - 300)

Automatic Callback Interval

- 3 rings ♦
- ____ rings (1 -6)

Extension Status

- Assign to operator positions
____ _
____ _
- Hotel
- Group Calling/CMS ♦

SMDR Options

Call Report Format

- Basic ♦
- ISDN

Call Length

- 40 seconds ♦
- ____ seconds (0-255)

Calls Reported

- Incoming and outgoing ♦
- Outgoing only

Inside Dial Tone

- Inside ♦
- Outside

Reminder Service Cancel

- No
- Yes, ____time of day

Calls to unassigned Extensions

- QCC, Extension No. _____ **
- Primary Operator+
- Another extension, Extension No. _____
- Calling Group, Extension No. _____

Recall Timer

- 350 ms
- 450 ms ♦
- 650 ms
- 1 sec

Rotary

- Delay ♦
- No Delay

Note: If you use equipment that rebroadcasts music or other copyrighted material, 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 representative.

♦ *Factory Setting*

**If the system has AUDIX Voice Power/FAXAttendant System, Integrated Administration will automatically set the Return Time/Interval to "6".*

*** Hybrid/PBX mode only*

Night Service - Time Set

Day	Start Time*	Stop Time*
Sunday (0)		
Monday (1)		
Tuesday (2)		
Wednesday (3)		
Thursday (4)		
Friday (5)		
Saturday (6)		

**Hours and minutes in 24-hour (military) time*

System Form 8a

Label Form — Posted Message

Message No.	Default Label	Revised Message (16 characters maximum)
1	DO NOT DISTURB	(Cannot be changed)
2	OUT TO LUNCH	| | | | | | | | | | | | | | | |
3	AT HOME	| | | | | | | | | | | | | | | |
4	OUT SICK	| | | | | | | | | | | | | | | |
5	IN A MEETING	| | | | | | | | | | | | | | | |
6	IN CONFERENCE	| | | | | | | | | | | | | | | |
7	WITH A CLIENT	| | | | | | | | | | | | | | | |
8	WITH A CUSTOMER	| | | | | | | | | | | | | | | |
9	AWAY FROM DESK	| | | | | | | | | | | | | | | |
10	OUT ALL DAY	| | | | | | | | | | | | | | | |
11	CUSTM MSG11	| | | | | | | | | | | | | | | |
12	CUSTM MSG12	| | | | | | | | | | | | | | | |
13	CUSTM MSG13	| | | | | | | | | | | | | | | |
14	CUSTM MSG14	| | | | | | | | | | | | | | | |
15	CUSTM MSG15	| | | | | | | | | | | | | | | |
16	CUSTM MSG16	| | | | | | | | | | | | | | | |
17	CUSTM MSG17	| | | | | | | | | | | | | | | |
18	CUSTM MSG18	| | | | | | | | | | | | | | | |
19	CUSTM MSG19	| | | | | | | | | | | | | | | |
20	CUSTM MSG20	| | | | | | | | | | | | | | | |

System Speed Dial

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ◆	No
#600				
#601				
#602				
#603				
#604				
#605				
#606				
#607				
#608				
#609				
#610				
#611				
#612				
#613				
#614				
#615				
#616				
#617				
#618				
#619				
#620				
#621				

◆ Factory Setting

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ♦	No
#622				
#623				
#624				
#625				
#626				
#627				
#628				
#629				
#630				
#631				
#632				
#633				
#634				
#635				
#636				
#637				
#638				
#639				
#640				
#641				
#642				
#643				

♦ Factory Setting

System Speed Dial

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ◆	No
#644		
#645		
#646		
#647		
#648		
#649		
#650		
#651		
#652		
#653		
#654		
#655		
#656		
#657		
#658		
#659		
#660		
#661		
#662		
#663		
#664		
#665		

◆ Factory Setting

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ◆	No
#666				
#667				
#668				
#669				
#670				
#671				
#672				
#673				
#674				
#675				
#676				
#677				
#678				
#679				
#680				
#681				
#682				
#683				
#684				
#685				
#686				
#687				

◆ Factory Setting

System Speed Dial

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ◆	No
#688		
#689		
#690		
#691		
#692		
#693		
#694		
#695		
#696		
#697		
#698		
#699		
#700		
#701		
#702		
#703		
#704		
#705		
#706		
#707		
#708		
#709		

◆ Factory Setting

Dial Code	Label (11 characters maximum)	Telephone Number (40 digits maximum)	Display	
			Yes ◆	No
#710				
#711				
#712				
#713				
#714				
#715				
#716				
#717				
#718				
#719				
#720				
#721				
#722				
#723				
#724				
#725				
#726				
#727				
#728				
#729				

Automatic Route Selection Tables*

Maximum: 16 Tables. (Make a copy for each table.)

Table No. _____

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1+7, dialing from
 - within area code
 - not within area code ♦

Area Code/Exchanges

001 _____	021 _____	041 _____	061 _____	081 _____
002 _____	022 _____	042 _____	062 _____	082 _____
003 _____	023 _____	043 _____	063 _____	083 _____
004 _____	024 _____	044 _____	064 _____	084 _____
005 _____	025 _____	045 _____	065 _____	085 _____
006 _____	026 _____	046 _____	066 _____	086 _____
007 _____	027 _____	047 _____	067 _____	087 _____
008 _____	028 _____	048 _____	068 _____	088 _____
009 _____	029 _____	049 _____	069 _____	089 _____
010 _____	030 _____	050 _____	070 _____	090 _____
011 _____	031 _____	051 _____	071 _____	091 _____
012 _____	032 _____	052 _____	072 _____	092 _____
013 _____	033 _____	053 _____	073 _____	093 _____
014 _____	034 _____	054 _____	074 _____	094 _____
015 _____	035 _____	055 _____	075 _____	095 _____
016 _____	036 _____	056 _____	076 _____	096 _____
017 _____	037 _____	057 _____	077 _____	097 _____
018 _____	038 _____	058 _____	078 _____	098 _____
019 _____	039 _____	059 _____	079 _____	099 _____
020 _____	040 _____	060 _____	080 _____	100 _____

Subpattern A Time of Day _____					Subpattern B Time of Day _____				
Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**	Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**
1 _____	_____	_____	1 _____	_____	1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____	2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____	3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____	4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____	5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____	6 _____	_____	_____	6 _____	_____

♦ Factory Setting
 *Hybrid/PBX mode only
 **Select Voice only, Data only, or Both.

Table No. _____

Type of Table

- 6-Digit
- Area Code
- Exchange
- 1+7, dialing from
 - within area code
 - not within area code ◆

Area Code/Exchanges

001 _____	021 _____	041 _____	061 _____	081 _____
002 _____	022 _____	042 _____	062 _____	082 _____
003 _____	023 _____	043 _____	063 _____	083 _____
004 _____	024 _____	044 _____	064 _____	084 _____
005 _____	025 _____	045 _____	065 _____	085 _____
006 _____	026 _____	046 _____	066 _____	086 _____
007 _____	027 _____	047 _____	067 _____	087 _____
008 _____	028 _____	048 _____	068 _____	088 _____
009 _____	029 _____	049 _____	069 _____	089 _____
010 _____	030 _____	050 _____	070 _____	090 _____
011 _____	031 _____	051 _____	071 _____	091 _____
012 _____	032 _____	052 _____	072 _____	092 _____
013 _____	033 _____	053 _____	073 _____	093 _____
014 _____	034 _____	054 _____	074 _____	094 _____
015 _____	035 _____	055 _____	075 _____	095 _____
016 _____	036 _____	056 _____	076 _____	096 _____
017 _____	037 _____	057 _____	077 _____	097 _____
018 _____	038 _____	058 _____	078 _____	098 _____
019 _____	039 _____	059 _____	079 _____	099 _____
020 _____	040 _____	060 _____	080 _____	100 _____

Subpattern A Time of Day _____				
Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type*
1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____

Subpattern B Time of Day _____				
Pool	FRL (3 ◆)	Other Digits	Absorb	Call Type*
1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____

◆ Factory Setting
 * Select Voice only, Data only, or Both.

Automatic Route Selection Default and Special Numbers Tables*

Table 17: Default Toll Table

Subpattern A Time of Day					Subpattern B Time of Day				
Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**	Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**
1 _____	_____	_____	1 _____	_____	1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____	2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____	3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____	4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____	5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____	6 _____	_____	_____	6 _____	_____

Table 18: Default Local Table

Subpattern A Time of Day					Subpattern B Time of Day				
Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**	Pool	FRL (3 ♦)	Other Digits	Absorb	Call Type**
1 _____	_____	_____	1 _____	_____	1 _____	_____	_____	1 _____	_____
2 _____	_____	_____	2 _____	_____	2 _____	_____	_____	2 _____	_____
3 _____	_____	_____	3 _____	_____	3 _____	_____	_____	3 _____	_____
4 _____	_____	_____	4 _____	_____	4 _____	_____	_____	4 _____	_____
5 _____	_____	_____	5 _____	_____	5 _____	_____	_____	5 _____	_____
6 _____	_____	_____	6 _____	_____	6 _____	_____	_____	6 _____	_____

Table 19: Dial 0

Pool	FRL (3 ♦)	Other Digits
1 _____	_____	_____

Table 20: Special Number (411. 611.811. 911)

Pool†	FRL (3 ♦)	Other Digits
1 _____	_____	_____

♦ Factory Setting

*HybridVPBX mode only

**Select Voice only, Data only, or Both.

† Always set to the first pool in the system; cannot be changed.

Appendix B: Data Forms

B

This appendix contains one copy of each Data Form. The forms are listed in Table B-1. It is recommended that you make copies of these forms and use the copies, keeping the originals for future use.

Table B-1. Data Forms

<u>Form No.</u>	<u>Form Title</u>
1a	Modem Pool—Analog to Digital
1b	Modem Pool—Digital to Analog
2a	Analog Data Station
2b	Digital Data Station
3	Data Hunt Groups

Data Form 1a

Modem Pool1 - Analog to Digital

Modem Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Modem		Data Module		Pair	Modem		Data Module	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Modem Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Modem		Data Module		Pair	Modem		Data Module	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Modem Pool Number _____									
Pool Member in data hunt group?									
<input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Modem		Data Module		Pair	Modem		Data Module	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Modem Pool Number _____									
Pool Member in data hunt group?									
<input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Modem		Data Module		Pair	Modem		Data Module	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Data Form 1b

Modem Pool - Digital to Analog

Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Data Module		Modem		Pair	Data Module		Modem	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Data Module		Modem		Pair	Data Module		Modem	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Data Module		Modem		Pair	Data Module		Modem	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				

Pool Number _____									
Pool Member in data hunt group? <input type="checkbox"/> Yes, DHG Extension No. _____									
Pair	Data Module		Modem		Pair	Data Module		Modem	
	Logical ID	Extension	Logical ID	Extension		Logical ID	Extension	Logical ID	Extension
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Data Hunt Groups

(Make a copy for each group.)

Group Number (1-32) _____ Factory-Set Ext. No. _____
 Group ID _____ Renumber To _____

Group Type

- Local Host Computer Access
- Workstation on LAN Access
- Analog-to-digital Pool
- Digital-to-Analog Pool

Stations

	Ext. No.	Person or Location		Ext. No.	Person or Location		Ext. No.	Person or Location		Ext. No.	Person or Location
1			6			11			16		
2			7			12			17		
3			8			13			18		
4			9			14			19		
5			10			15			20		

Trunks or Pools

Logical ID	Trunk or Pool						
1		21		41		61	
2		22		42		62	
3		23		43		63	
4		24		44		64	
5		25		45		65	
6		26		46		66	
7		27		47		67	
8		28		48		68	
9		29		49		69	
10		30		50		70	
11		31		51		71	
12		32		52		72	
13		33		53		73	
14		34		54		74	
15		35		55		75	
16		36		56		76	
17		37		57		77	
18		38		58		78	
19		39		59		79	
20		40		60		80	

Appendix C: T1/PRI Review

C

To ensure compatibility with the system, all local offerings of DS1 configurations must be reviewed by National Technical Marketing (NTM) personnel. This review begins when NTM receives the "T1/PRI Planner." This appendix contains instructions for completing the planner, including the form needed. It is recommended that you make copies of these form pages and use the copies, keeping the originals for future use.

Form Needed:

T1/PRI Planner

Planning Form Instructions

1. On Page 1, fill in the customer name, telephone number, and address.

NOTE:

"Reference Number" is filled in by NTM.

2. Fill in the Order Number.
3. Identify the personnel handling the account:
 - a. Account Executive's name and telephone number.
 - b. System Consultant's name and telephone number.
4. Identify the DS1 facility vendor by writing the vendor's name in the "T1/PRI Vendor" space along with the contact person's name and telephone number.

5. Under the “installation” heading:
 - a. Write the “Due Date” on which the installation is scheduled to be complete.
 - b. Write the date the equipment is scheduled for delivery to the customer next to “Materials-on-Job Date.”
6. Under the “Installation Contacts” heading, list the names and telephone numbers of the personnel responsible for the equipment order and its installation:
 - a. (Order) Implementor
 - b. NTM Manager
 - c. National Technical Service Center (NTSC) Engineer
 - d. Data Services Organization (DSO) Manager
7. Under the question about whether the order has been placed:
 - If the order has been placed, check “Yes” and fill in the date.
 - If the order has not been placed, check “No.”
8. On Page 2, complete one box for each 100D module by transferring the options information for each module from the corresponding box on Page 1 of Form 3b:
 - a. Service Ordered or Planned (Type of Service)
 - b. Frame Format
 - c. Line Coding (Suppression)
 - d. Line Signaling Mode
 - e. Synchronization Timing (Clock Synchronization: Source)
9. To ensure that the synchronization integrity of the network—both this communications system and its far-end connections—is protected, prepare the “Network Planning Map” on Page 3 for review by NTM. Describe the entire network of DS1 facilities by summarizing the following for each 100D module:
 - a. Fill in the control unit slot number(s) of the 100D modules connected to the CSU(S).
 - b. Write the approximate number of cable feet between each module and its CSU or far-end connection. (Refer to “Line Compensation” on Page 1.)

- c. For the model number(s) of the CSU(S), do *one* of the following:
 - Check the appropriate box if “551-T1” or “ESF-T1.”
 - If “Other,” check that box and write the manufacturer’s name and model number in the space provided at the bottom of the page,
 - If no CSU is needed, check “None.”
- d. In the connection block(s), describe the DS1’s far-end connection by doing one of the following:
 - If connected to the telephone company central office, check “CO.”
 - If connected to another communications system, check “PBX.”
 - If connected to the PRI network, check “PRI.”
 - If the facility’s type of service is T1, check the type(s) of emulated trunks. Also, check “Services” if the facility includes services such as MultiQuest with DNIS.
- e. Describe the clock synchronization sources according to the key at the lower left of the map:
 - a. Draw a circle and line from the clock source to the appropriate 100D module.
 - b. Label the circle “P” for primary, “S” for secondary, or “T” for tertiary.

10. Make a copy of the T1/PRI Planner for your records and forward the original to National Technical Marketing (NTM).

As an example, the system described in Figure C-1 shows a processor module system with two 100D modules.

The communications system in Figure C-1 is configured as follows:

- Module 1 in slot 04 is connected to a model ESF-T1 CSU that is approximately 100 cable feet from the control unit. (The DS1 facility is connected to the PRI network.)
- Module 2 in slot 05 is connected to a 551-T1 CSU that is approximately 160 cable feet from the control unit. (The far end is another communications system.)
- The primary clock synchronization source is the PRI network connected to Module 1. Its path is shown by a line and the letter P.
- The secondary clock synchronization path, shown by a line and the letter S, is the system internal clock.

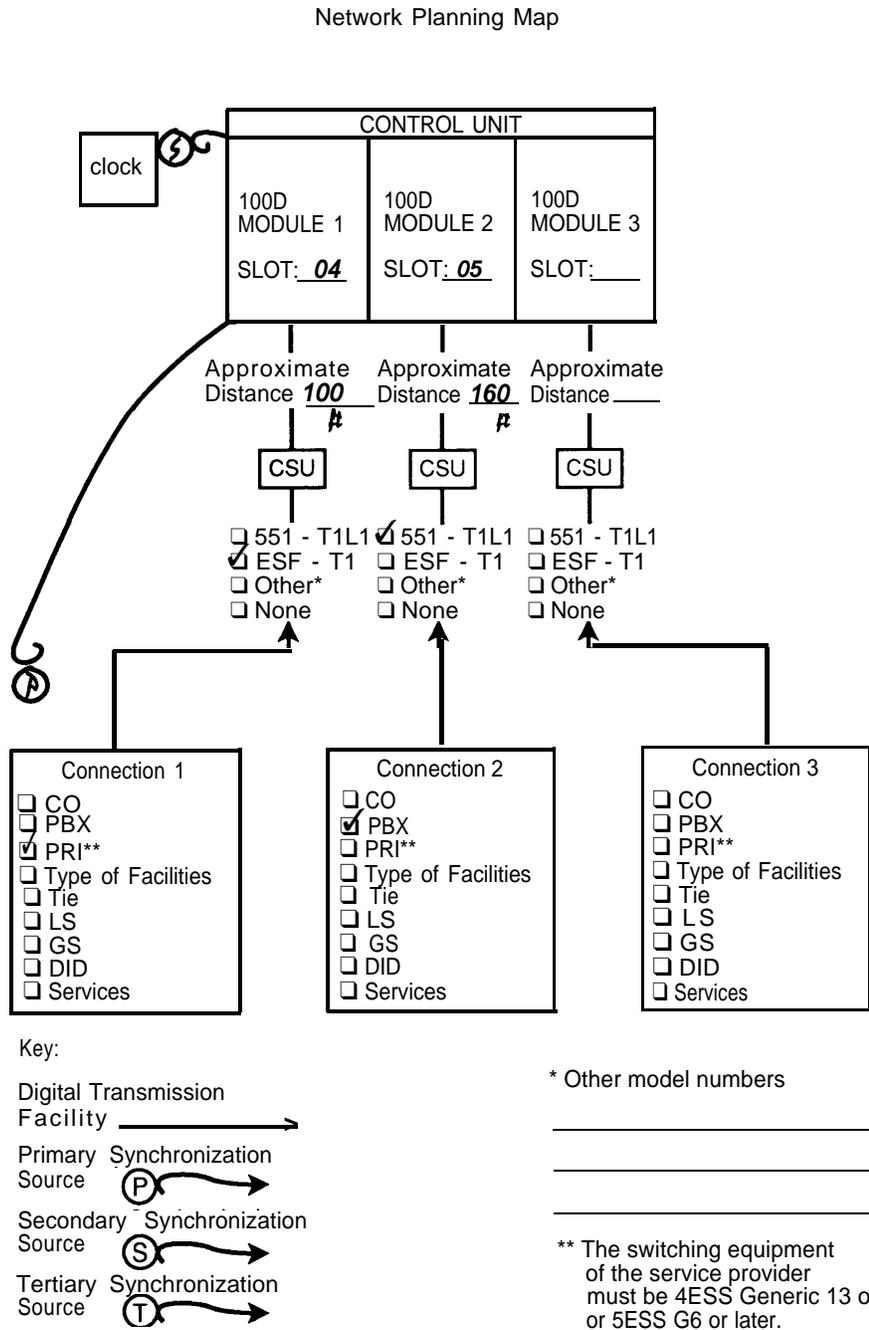


Figure C-1. Sample Network Planning Map

NTM also evaluates the complexity of the facility configuration requested. Examples of complex configurations are connections into PBX networking applications, connections to multiplexing arrangements, or applications that involve customer engineering or design. NTM then does one of the following:

- If an order is considered complex, NTM directs you to the Business Communications System (BCS) National Engineering Center (NEC).
- If NTM notifies you that the order's configuration is not complex, Tier III General Business System (GBS) National Technical Service Center (NTSC) is authorized to approve the configuration.

The NTSC group's pre-authorization review is based, in part, on information you provide to them. Specifically, you must send them the following:

- a copy of the planner
- a completed "Non-Complex Configuration" sheet (Pages 5 through 7 of the Planner) for each 100D module you plan to install

Planning Form Instructions (Continued)

Complete one "Non-Complex Configuration" page (Pages 5 through 7) for each 100D module. Label the top right corner of the copies "Page 1 of ___" (1, 2, or 3).

On each page:

1. Write the module number (1, 2, or 3). Indicate the total number of 100D modules (maximum of 3 per system).
2. Fill in the control unit slot number. (Refer to Page 1 of Form 3b.)
3. In the "Services" section:
 - a. Check the box next to each emulated trunk or service that will be connected. Check only those services allowed on the type of service (T1 or PRI) selected for the module.
 - b. Circle the channel(s) to which each emulated trunk or service will be assigned.

NOTE:

No channel should show more than one trunk or service, and the 24th channel cannot be used if the signaling type is common channel.

4. If the type of service is PRI, complete the "PRI Identification Service" section by doing one of the following:
 - If you are not planning to use the number identification service, check the "No" box and continue to Step 6.
 - If you are planning to use the identification services, check the "Yes" box and check the service planned:
 - For incoming calls, check "ANI," "SID," or "Both." If both automatic and station identification service are planned, indicate the order in which the information should be displayed (ANI then SID or SID then ANI).
 - For outgoing calls, check either "ANI" or "SID" to indicate the service planned. If you are planning to prevent sending out your own caller identification information, check the box labeled "SID/ANI Privacy."

NOTE:

The availability of the caller identification information may be limited by local-serving (caller's) jurisdiction, availability, or central office equipment.

5. In the "Channel Service Unit" section:
 - a. Check the box that describes the channel service unit used. If you are not using one of the two models listed, check the third box and write in the manufacturer information that describes the unit.
 - b. Forward all copies of this page along with a copy of the Planner to Tier III, General Business Systems, National Technical Service Center.

MERLIN LEGEND Communications System Release 2.0
T1/PRI Planner

For Use with Form 3b, Incoming Trunks-DS1 Connectivity (100D Module)

Reference No. _____

Customer

*Name _____ Tel. No. _____

*Address _____

* Order Number _____

Account Executive _____ Tel. No. _____

Systems Consultant _____ Tel. No. _____

T1/PRI Vendor

*Name _____

Contact _____ Tel. No. _____

Installation

Due Date _____

Materials-on Job Date _____

Installation Contacts

Implementor _____ Tel. No. _____

NTM Manager _____ Tel. No. _____

NTSC Engineer _____ Tel. No. _____

DSO Manager _____ Tel. No. _____

Has order been placed with the network provider for this service?

Yes, Date _____

No

* Required fields for presale.

***Module 1**

Service Ordered or Planned

- PRI
- T1

Frame Format

- ESF - Preferred.
- D4 - Maybe used if required by local telephone company.

Line Coding (Suppression)

- B8ZS - Preferred.
- AMI-ZCS

Line Signaling Mode

- Common Channel - Required for PRI.
- Local

Synchronization Timing

- Loop - Default.
- Local

***Module 2**

Service Ordered or Planned

- PRI
- T1

Frame Format

- ESF - Preferred.
- D4 - Maybe used if required by local telephone company.

Line Coding (Suppression)

- B8ZS - Preferred.
- AMI-ZCS

Line Signaling Mode

- Common Channel - Required for PRI.
- Robbed Bit

Synchronization Timing

- Loop-Default.
- Local

***Module 3**

Service Ordered or Planned

- PRI
- T1

Frame Format

- ESF - Preferred.
- D4 - May be used if required by local telephone company.

Line Coding (Suppression)

- B8ZS - Preferred.
- AMI-ZCS

Line Signaling Mode

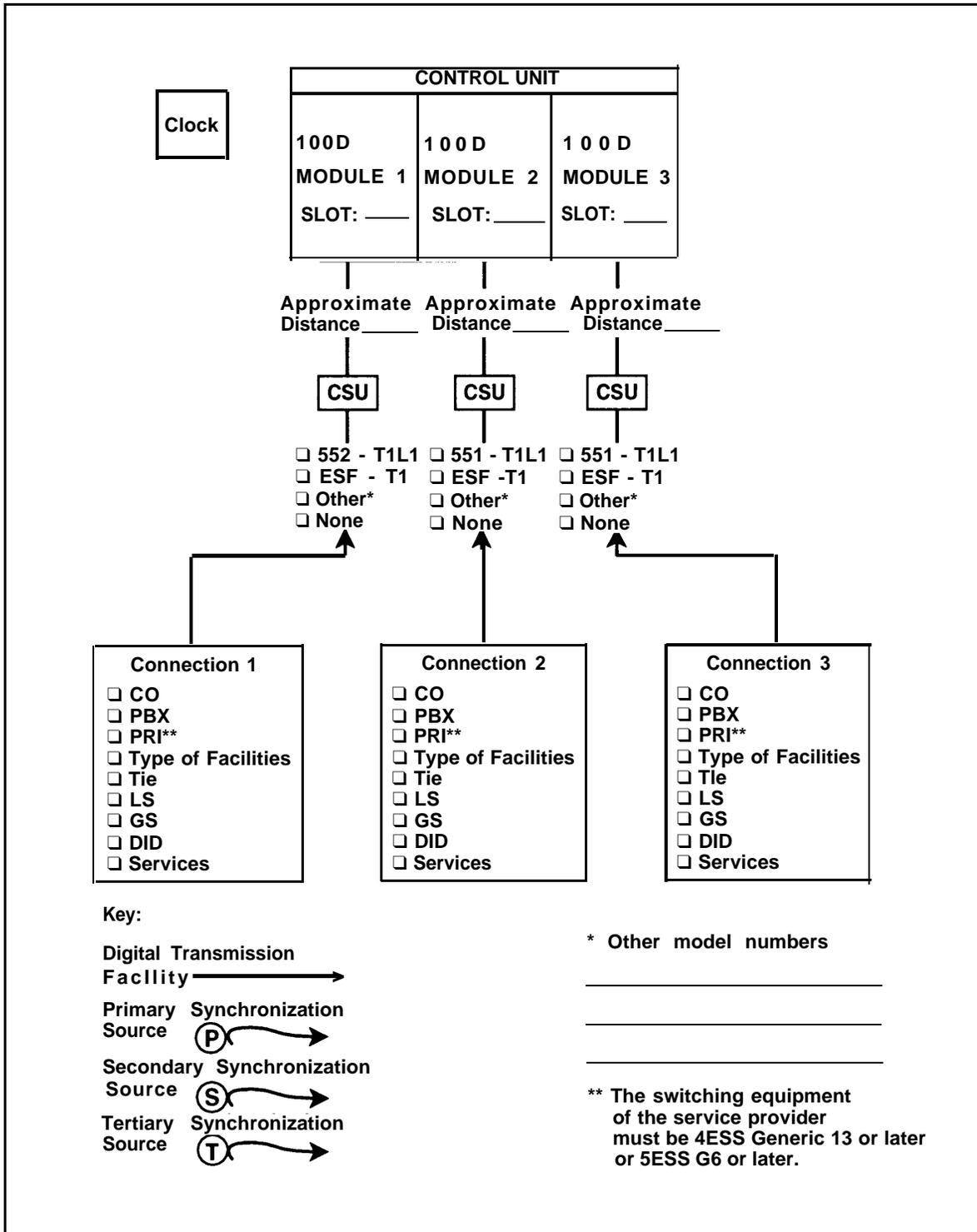
- Common Channel - Required for PRI.
- Robbed Bit

Synchronization Timing

- Loop - Default.
- Local

**All fields required for presale*

Network Planning Map



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Non-Complex Configuration

Module ____ of ____ Slot No. _____

Services*

Subscribed To:	Channels Assigned to Service
<input type="checkbox"/> Ground-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Loop-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Tie Trunk (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> MultiQuest 900 (w/wo DNIS) (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom** <input type="checkbox"/> OUTWATS† (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom 800 <input type="checkbox"/> INWATS† (w/wo DNIS)** (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom/ Megacom 800** <input type="checkbox"/> OUTWATS/ (T1 or PRI) INWATS†	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> SDN** <input type="checkbox"/> VPN† (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> ACCUNET Switched <input type="checkbox"/> 56/64 Digital† Digital Service (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> DID (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Call-by-Call Service Selection (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

PRI Identification Service

*Will SID/ANI be used?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
Incoming calls	<input type="checkbox"/> ANI	<input type="checkbox"/> SID	<input type="checkbox"/> Both. . . Prefer _____ then _____
Outgoing calls	<input type="checkbox"/> ANI	<input type="checkbox"/> SID/ANI Privacy	<input type="checkbox"/> SID - Extension Based <input type="checkbox"/> SID - Line Based

Channel Service Unit

Mfr	<input type="checkbox"/> AT&T	<input type="checkbox"/> AT&T	<input type="checkbox"/> ‡ _____
Md1	551-T1L1	ESF-T1	_____
REG#	GI 472-16819-DE-N	GIC 472-16544-DE-N	_____
FIC	4DU 158	4DN 188	_____

‡ If a CSU other than the two listed AT&T models is used, AT&T will not accept the responsibility for its installation, connection, or testing.

* Required fields for presale
 ** 4ESS
 † 5ESS

Non-Complex Configuration

Module ___ of ___ Slot No. _____

Services*

Subscribed To:	Channels Assigned to Service
<input type="checkbox"/> Ground-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Loop-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Tie Trunk (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> MultiQuest 900 (w/wo DNIS) (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom** <input type="checkbox"/> OUTWATS † (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom 800 <input type="checkbox"/> INWATS † (w/wo DNIS)** (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom/ Megacom 800** <input type="checkbox"/> OUTWATS/ (T1 or PRI) INWATS †	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> SDN** <input type="checkbox"/> VPN † (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> ACCUNET Switched <input type="checkbox"/> 56/64 Digital † Digital Service (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> DID (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Call-by-Call Service Selection (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

PRI Identification Service

*Will SID/ANI be used?	<input type="checkbox"/> No	<input type="checkbox"/> Yes	
Incoming calls	<input type="checkbox"/> ANI	<input type="checkbox"/> SID	<input type="checkbox"/> Both. . . Prefer _____ then _____
Outgoing calls	<input type="checkbox"/> ANI	<input type="checkbox"/> SID/ANI Privacy	<input type="checkbox"/> SID - Extension Based <input type="checkbox"/> SID - Line Based

Channel Service Unit

Mfr	<input type="checkbox"/> AT&T	<input type="checkbox"/> AT&T	<input type="checkbox"/> † _____
Md1	551-T1 L1	ESF-T1	_____
REG#	GI 472-16819-DE-N	GIC 472-16544-DE-N	_____
FIC	4DU 158	4DN 188	_____

† If a CSU other than the two listed AT&T models is used, AT&T will not accept the responsibility for its installation, connection, or testing.

* Required fields for presale

** 4ESS

† 5ESS

Non-Complex Configuration

Module ___ of ___ Slot No. _____

Services*

Subscribed To:	Channels Assigned to Service
<input type="checkbox"/> Ground-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Loop-start (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Tie Trunk (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> MultiQuest 900 (w/wo DNIS) (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom** <input type="checkbox"/> OUTWATS† (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom 800 <input type="checkbox"/> INWATS† (w/wo DNIS)** (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Megacom/ Megacom 800** <input type="checkbox"/> OUTWATS/ INWATS† (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> SDN** <input type="checkbox"/> VPN† (T1 or PRI)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> ACCUNET Switched <input type="checkbox"/> 56/64 Digital† Digital Service (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> DID (T1 only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
<input type="checkbox"/> Call-by-Call Service Selection (PRI only)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

PRI Identification Service

*Will SID/ANI be used?	<input type="checkbox"/> No	<input type="checkbox"/> Yes
Incoming calls	<input type="checkbox"/> ANI <input type="checkbox"/> SID	<input type="checkbox"/> Both. . . Prefer _____ then _____
Outgoing calls	<input type="checkbox"/> ANI <input type="checkbox"/> SID/ANI Privacy	<input type="checkbox"/> SID - Extension Based <input type="checkbox"/> SID - Line Based

Channel Service Unit

Mfr	<input type="checkbox"/> AT&T	<input type="checkbox"/> AT&T	<input type="checkbox"/> ‡ _____
Md1	551-T1L1	ESF-T1	_____
REG#	GI 472-16819-DE-N	GIC 472-16544-DE-N	_____
FIC	4DU 158	4DN 188	_____

‡ If a CSU other than the two listed AT&T models is used, AT&T will not accept the responsibility for its installation, connection, or testing.

* Required fields for presale

** 4ESS

† 5ESS

Appendix D: DS1 Connectivity Ordering

D

After the contract is signed, your sales representative or authorized dealer contacts the DS1 connectivity vendor to discuss the T1/PRI service order. The vendor needs information about the communications system as well as customer identification. Table D-1 describes the kind of information the vendor requires. This table should be reviewed with the customer's network representative or dealer so the information will be available when needed.

Appendix E: Unit Load Calculation

E

A unit load is a measure of power (1.9 watts) used to determine the electrical load that the following components have on **each carrier's** power supply:

- telephones and adjuncts

Only the telephones and adjuncts that connect to the analog and digital ports on the control unit require unit load calculation. Do not include any equipment with its own power supply in the unit load calculation.

- direct-inward dial (DID) modules

Unit load and auxiliary power requirements for a new system are computed automatically when the equipment for the system is initially ordered. These calculations are based on the assumption that each module is fully utilized, that is, all jacks are used.

It may be useful to obtain more accurate calculations, for example, if the modules are not fully utilized, if there is a change in the equipment, or if you suspect that a particular carrier has more unit loads than the power supply can handle. You can calculate the actual unit load using the worksheet and instructions in this appendix.

Unit Load Rules

A general rule to follow is that if you can distribute the DID modules and telephone modules equally across the carriers, you will prevent unnecessary drain on any one carrier.

Also, depending on the system's mode, the rules vary. This section provides the rules for calculating unit loads in various modes.

Unit Loads for the Hybrid/PBX Mode

The power supply generally supports six modules of any type in a system in Hybrid/PBX mode—without requiring an auxiliary power unit.

If, however, both of the following conditions are true, the unit loads on a carrier can exceed the 54-unit maximum, and therefore require auxiliary power:

- all six carrier slots are occupied by MLX telephone or analog multiline telephone modules
- the carrier has a total of more than 45 MLX-20L telephones or 34-button analog multiline telephones installed

Unit Loads for Key or Behind Switch Mode

In a Key or Behind Switch system with four or fewer modules, no calculation is needed. The power supply generally supports four modules of any type in Key or Behind Switch mode.

Calculating Unit Loads

Use the worksheet and instructions in the remainder of this appendix to calculate unit loads for each carrier. Make a copy of all pages of the worksheet for each carrier.

Unit Load Worksheet

1. Number of modules in carrier (excluding power supply and processor): _____

■ If fewer than 5, auxiliary power is not required.

■ If 5 or 6, continue to Step 2.

2. Key or Behind Switch mode only: Square
Indicate configuration of lines; then go to Step 5. Modified

3. Hybrid/PBX mode only: Yes
Do all modules in the carrier have MLX and/or No
analog multiline telephone jacks?

■ 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 MIX-28D 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 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			13.25	
008 OPT			8.0	
012			8.4	
100D			0.0	
400			0.0	
400 EM			8.0	
400 GS/LS/TTR			0.0	
408			12.0	
408 GS/LS			12.0	
408 GS/LS-MLX			13.5	
800			0.0	
800 GS/LS			0.0	
800 DID			8.0	
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	Unit Load		= Total
		Hybrid/PBX or Modified	Square	
Network Access Lines*				
DID		1.0	1.0	
DS1		0.0	0.0	
GS/LS		0.0	0.0	
Tie		1.4	1.4	
Telephones				
MLX-10		.9	1.2	
MLX-10D		.9	1.2	
MLX-28D		1.2	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		1.1	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		1.2	1.7	
34-Button BIS		1.2	1.4	
34-Button BIS/DIS		1.2	1.4	
Single-Line Telephone		0.6	0.7	
<i>Continued</i>				

* Unit loads are computed per trunk for trunk-type network access lines.

Equipment	Qty x	Unit Load		= Total
		Hybrid/PBX or Modified	Square	
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				

† The MFM has its own wall power unit located at the telephone and therefore is not added to 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.

- 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.

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 through 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
		Hybrid/PBX or Modified	Square	
Network Access Lines*				
DS1		0.0	0.0	
GS/LS		0.0	0.0	
Tie		1.4	1.4	
Telephones				
MLX-10		.9	1.2	
MLX-10D		.9	1.2	
MLX-28D		1.2	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	1.23	
4-Button Basic		0.9	1.1	
34-Button DLX		1.2	1.7	
34-Button BIS		1.2	1.4	
34-Button BIS/DIS		1.2	1.4	
Single-Line Telephone		0.6	0.7	
<i>Continued</i>				

* Unit loads are computed per trunk for trunk-type network access lines.

Equipment	Qty x	Unit Load		= Total
		Hybrid/PBX or Modified	Square	
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				

† The MFM has its own Individual wall power unit located at the telephone and therefore is not added to 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.

- 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.

9. Try to exchange modules between carriers to reduce the unit loads for slots 5 and 6 through 27. (Remember that the 100D, 400, 400 GS/LS, 800, and 800 GS/LS modules have unit loads of 0.0.) Repeat Steps 1 through 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 through 27 or less, auxiliary power is sufficient.
- If the exchange does not reduce the unit load for slots 5 and 6 through 27, install wall power units for the appropriate number of telephones to reduce the unit load to 27.

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