Lucent Technologies
Bell Labs Innovations

MERLIN LEGEND® Communications System Release 7.0

Pocket Reference

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Notice

Every effort has been made to ensure that the information in this guide is complete and accurate at the time of printing. Information, however, is subject to change. See Appendix A, “Customer Support Information,” in *System Programming*, for important information.

Your Responsibility for Your System’s Security

Toll fraud is the unauthorized use of your telecommunications system by an unauthorized party—for example, persons other than your company’s employees, agents, subcontractors, or persons working on your company’s behalf. Note that there may be a risk of toll fraud associated with your telecommunications system, and, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

You and your system manager are responsible for the security of your system, such as programming and configuring your equipment to prevent unauthorized use. The system manager is also responsible for reading all installation, instruction, and system administration documents provided with this product in order to fully understand the features that can introduce risk of toll fraud and the steps that can be taken to reduce that risk. Lucent Technologies does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. Lucent Technologies will not be responsible for any charges that result from such unauthorized use. For important information regarding your system and toll fraud, see Appendix A, “Customer Support Information,” in *System Programming*.

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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 their own expense. For further FCC information, see Appendix A, “Customer Support Information,” in *System Programming*.

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 classe A préscrites dans le réglement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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For more information about Lucent Technologies documents, refer to the section entitled, “Related Documents” in “About This Guide.”

Support Telephone Number

In the continental US, Lucent Technologies provides a toll-free customer helpline 24 hours a day. Call the Lucent Technologies Helpline at **1-800-628-2888** or your Lucent Technologies authorized dealer if you need assistance when installing, programming, or using your system. Outside the continental US, contact your local Lucent Technologies authorized representative.

Network Engineering Group

For assistance in designing a private network, call the Network Engineering Group at 1-888-297-4700.

Lucent Technologies Corporate Security

Whether or not immediate support is required, all toll fraud incidents involving Lucent Technologies products or services *should be reported* to Lucent Technologies Corporate Security at **1-800-821-8235**. In addition to recording the incident, Lucent Technologies Corporate Security is available for consultation on security issues, investigation support, referral to law enforcement agencies, and educational programs.

Lucent Technologies Fraud Intervention

If you *suspect you are being victimized* by toll fraud and you need technical support or assistance, call BCS National Service Assistance Center at **1-800-628-2888**.

Warranty

Lucent Technologies provides a limited warranty on this product. Refer to “Limited Warranty and Limitation of Liability” in Appendix A, “Customer Support Information,” in *System Programming*.

Contents

Release 7.0 Enhancements (April 1999)

Release 7.0 includes all Release 6.1 functionality, plus the enhancements listed below.

- **MLS and Enhanced Tip/Ring (ETR) Telephone Support**

  One of the most important new capabilities of MERLIN LEGEND Release 7.0 is its support for MLS and ETR telephones, allowing existing customers with either telephones the ability to migrate to a MERLIN LEGEND Communications System. The MLS telephones include the MLS-6®, MLS-12®, MLS-12D®, MLS-18D®, and MLS-34D®. The ETR telephones include the ETR-6, ETR-18, ETR-18D, and ETR-34D. The Business Cordless 905 telephone and the TransTalk™ 9000 Digital Wireless System are also supported.

  The MLS, ETR, and Business Cordless 905 telephones, as well as the TransTalk 9000 Digital Wireless System, require ETR station ports. To provide support for these telephones and for the TransTalk 9000 system, two new modules have been designed:

  - **412 LS-ID-ETR Module**. The 412 LS-ID-ETR module is not available. To connect ETR and MLS telephones to a MERLIN LEGEND Communications System, use the 016 ETR module.
  - **016 ETR Module**. The 016 ETR module provides 16 ETR station ports, including 6 with T/R functionality and 4 TTRs. On the 016 ETR module, the first 10 ports are ETR ports only—these ports do not have T/R functionality. The remaining 6 ports (ports 11 through 16) can be programmed to support either T/R or ETR, but not both simultaneously.

- **Expanded Digital Endpoint Connectivity**

  Release 7.0 increases the maximum number of digital telephones supported from 127 to 200 by introducing a new 016 MLX module. In addition, each of the 200 ports can support an MFM adjunct which increases the current 255 station endpoints to 400.

  - **016 MLX Module**. Each 016 MLX module provides 16 digital station ports and has an additional 32K of dual port RAM.
  - **Processor Module**. The 016 MLX module can only be utilized with the CKE4 or later processor module with upgrade to R7.0 software. The CKE4 processor module provides the lead to access the additional 32K of RAM on the 016 MLX module.

- **Voice Announce on Idle Only Option on MLX Telephones**

  Prior to Release 7.0, no options were available for disabling intercom voice announcements at an MLX telephone when busy. In Release 7.0, a new option—Voice Announce on IDLE ONLY—is available with the existing Voice Announce feature. This new option allows a user to receive intercom voice announcements only when they are not active on another call.

- **Priority Call Queuing**

  Priority call queuing provides the ability to:

  - Place some callers ahead of others who are waiting for the same agent group.
  - Give key clients priority over others.
  - Automatically increase the number of agents answering calls during busy times, while continuing to offer callers the choice to leave a message instead of waiting.
  - Keep costs down by handling toll free calls (calls arriving on 800 and 888 lines) before processing calls on local lines.

  Priority call queuing is accomplished in Release 7.0 by allowing you to define a supportive relationship between calling groups. Calls that arrive in one calling group can be processed by another calling group when no one from the first calling group is available to answer the call. Through system programming, a calling group can be assigned a priority level between 1 (highest priority) and 32 (lowest priority) and then designated as a support group for another group.

- **Calling Party Name on Caller ID**

  Release 7.0 continues to support Calling Party Number and adds a new functionality for Calling Party Name. By programming a button on the telephone or with a feature code through centralized programming, users are able to toggle between displaying the caller's telephone number or the caller's name. In order to use this feature, users must subscribe to caller identification from their local exchange carrier (LEC).

  Calling Party Name can be 15 characters in length for MLX telephones as well as for ETR and MLS telephones. Calling Party Name is not recorded on SMDR reports. In addition, neither Calling Party Name nor Calling Party Number are displayed on analog multiline telephones.

  This feature requires loop-start (LS) trunks. The existing LS-ID delay feature must be programmed for each line, as well. This prevents Calling Party Number and Name information from being lost when a call is answered too quickly.

  Release 7.0 software also supports the Caller ID capability of the 408 GS/LS-ID-MLX module. Although previously orderable, the Caller ID capability of this module could not be used until Release 7.0 software became available.

- **MLX Headset Operation**

  Headset operation in Release 7.0 has been enhanced so that MLX headset operation more closely mimics the handset operation in the following ways:

  – When a person is on a call using a headset and the headset auto-answer is turned on, the user hears a short ring when another call is coming in. In previous releases, this ring was not provided.

  – When a person receives a voice-announced call and handles the call by using a headset and turning off the speakerphone, the associated LEDs (the DSS button and the inside Auto Dial button) for that extension at other telephones are lit. In previous releases, the LEDs for that extension did not light at the other telephones.

  – When a reliable disconnect occurs on a headset-handled call, the associated LEDs (the DSS button and the inside Auto Dial button) for that extension at other telephones are turned off. In previous releases, the LEDs for that extension remained lit at the other telephones unless the user pressed the Headset Hangup button.

- **Touch-Tone or Rotary Signaling**

  Beginning in Release 7.0, you can program tip/ring ports to use rotary signaling. You can program any tip/ring port on an individual basis (including ports on the 412 LS-ID-ETR and 016 ETR modules that are programmed for tip/ring operation). The factory setting is that rotary signaling is disabled.

  Whenever the system receives a rotary digit on a port, it determines if the port is programmed as rotary-enabled. If the port is rotary-enabled, the system processes the digit. If the port is not rotary-enabled, the digit is rejected. Touch-tone digits are always accepted by the port, regardless if it is rotary-enabled or not.

- **Abandoned Call Information Reported to MERLIN LEGEND Reporter**

  For abandoned calls, you are now able to identify the queue or the agent where the call was abandoned. The MERLIN LEGEND Release 7.0 software has been modified so that either of the following occurs:

  – If the caller hangs up while the call is in queue, the Auto Login/Logout Group ID is entered into the Station Message Detail Recording (SMDR) record.

  – If the caller hangs up while the call is ringing at a group member's extension, that group member's extension number is entered into the SMDR record.

Release 6.1 Enhancements (August 1998)

Release 6.1 includes all Release 6.0 functionality plus the enhancements listed below.

- **Private Networking**

  Release 6.1 enhances the functioning of the networked MERLIN LEGEND Communications System in a number of ways:

  - Centralized Voice Messaging
  - Group Calling Enhancements
  - Transfer Redirect
  - Direct Station Selector
  - Call Forwarding
  - SMDR
  - Decrease in Call Set-Up Time
  - PRI Switch Type Test

- **Centralized Voice Messaging**

  One or more MERLIN LEGEND Systems (Release 6.1 or later) can share the voice messaging system (VMS) of another MERLIN LEGEND System, provided the systems are directly connected to the system with the VMS. In this configuration, the system containing the VMS is known as the *hub*. This sharing of the VMS is called *Centralized Voice Messaging*. Centralized Voice Messaging includes the functions of voice mail, Automated Attendant, and fax messaging. See the *Network Reference* for detailed information about Centralized Voice Messaging.

  Centralized Voice Messaging offers the following benefits:

  - Private-networked MERLIN LEGEND Systems do not need a local VMS. Having systems use a centralized VMS instead of separate VMSs is more economical.
  - Users who travel between sites can dial the same digits anywhere in the private network to access the voice messaging system. For example, a salesperson headquartered in Cincinnati can dial the same four digits at the company's Los Angeles office to retrieve voice messages.
  - Productivity is enhanced because messages can be forwarded and broadcast to all personnel within the private network.
  - Calling groups on networked systems can send overflow coverage to a shared VMS, so that an incoming caller can leave a message instead of waiting in a queue.
  - The VMS can light the Message Waiting lights on multiple MERLIN LEGEND Systems in a private network. This greater efficiency saves time because a user only has to look at his or her telephone to determine if he or she has a message.

- **Group Calling Enhancements**

  A calling group can have a *single* non-local member that is defined by the Uniform Dial Plan and exists on another MERLIN LEGEND Communications System connected by a tandem trunk to the local system. If a calling group contains a non-local member, the non-local member must be the *only* member in the calling group. See the *Network Reference* for details.

  A calling group containing a single non-local member can be used for the same purposes as a calling group containing local extensions, including:

  - **Night Service**. Night Service coverage can be provided across a private network to a centralized Automated Attendant, a non-local calling group, a QCC queue, a DLC, or any individual extension on the remote system, such as a night bell.
  - **Group Coverage**. Group Coverage can be provided across a private network to a VMS, a non-local calling group, a QCC queue, a DLC, or any individual extension on the remote system.
  - **Calling Group Overflow Coverage**. Calling group overflow coverage can be provided by a centralized VMS, a non-local calling group, a QCC queue, a DLC, or any individual extension on the remote system.
  - **Calls Directed to Another System**. Lines connected to remote systems can be answered by any extension programmed to answer the call, such as a centralized Automated Attendant or a system operator (QCC or DLC).

- **Transfer Redirect**

  When an Automated Attendant transfers a call to a non-local extension, the transferring MERLIN LEGEND System monitors the call to ensure that it is answered. If the non-local extension is not available, or the call is not answered within the transfer redirect timeout period (fixed at 32 seconds), the call stops ringing at the non-local destination and is redirected to the extension on the same system as the Automated Attendant that is programmed to receive redirected calls. This redirect extension can be a QCC queue, a calling group, or an individual extension.

- **Direct Station Selector**

  Now users can press a Direct Station Selector (DSS) button for a non-local extension to make or transfer calls to that extension. No busy indication, however, is displayed by the DSS for non-local extensions.

- **Call Forwarding**

  The Forward feature now can be used to send calls to non-local extensions across the private network.

- **SMDR**

  In addition to SMDR options for non-network calls placed to and from the local system, system managers now can program SMDR to log incoming and outgoing UDP calls, or they can choose to log no UDP calls. The factory setting is to record all UDP calls.

  Customers who use a call accounting system may not want to fill the database with calls coming and going across the private network. These customers may choose not to log UDP calls.

- **Decrease in Call Setup Time**

  The setup time for a call across a private network has been reduced by programming the number of UDP digits expected.

- **PRI Switch Type Test**

  A new maintenance test, the PRI Switch Type Test, has been created to allow Lucent Technologies technicians or authorized dealers to automatically determine if each end of the PRI tandem trunks has been programmed correctly. The test works for directly connected MERLIN LEGEND Systems, not for DEFINITY® systems.

  For a PRI tandem trunk to operate correctly between two MERLIN LEGEND Systems, one system must have the PRI Switch Type set to Network, and the other system must have the PRI Switch Type set to PBX. If both ends of the PRI tandem trunk are programmed the same, problems occur in the communications between the two systems.

- **Service Observing**

  Service Observing allows one extension to listen in on (observe) a call at another extension. A typical application of this feature is that of a Customer Service supervisor observing how a Customer Service representative handles calls.

  The Service Observing group can listen to anywhere from one extension to all extensions in the system, including other Service Observers. Up to 16 Service Observing groups can be programmed. The Service Observer and the observed extension must be on the same system.

  The observer activates Service Observing either by pressing a Service Observing button and then dialing an extension number, or by pressing a DSS or Auto Intercom button. The Service Observer must use an MLX telephone to observe an extension; the telephone at the observed extension can be of any type.

  A warning tone that alerts the observer, the observed extension, and the caller that Service Observing is occurring can be set to on or off through System Programming. The factory setting is on.

- **WinSPM**

  The System Programming and Maintenance (SPM) software is now available in a Windows format called WinSPM. For R6.1 and later systems, WinSPM provides a graphical user interface (GUI) for those tasks most commonly performed by the system manager. Pictorial representations of system components, such as modules and their vintages and the creation of MLX telephone button labels appear on WinSPM. Supported in Windows 95, Windows NT, and Windows 98, WinSPM is also backwards-compatible with previous DOS versions of SPM and is available on CD-ROM.

- **Windows NT Driver**

  The MERLIN LEGEND Windows NT PBX driver is available in R6.1. When coupled with the CentreVU Telephony Services application, the driver provides true server-based Computer Telephony Integration (CTI). The new driver requires a MERLIN LEGEND System of Release 5.0 or later and servers and PCs that support the applications.

Release 6.0 Enhancements (February 1998)

Release 6.0 includes all Release 5.0 functionality, plus the enhancements listed below.

- **Private Networks**

  In Hybrid/PBX mode systems only, MERLIN LEGEND Communications Systems can be networked with one another or with DEFINITY Enterprise Communications Server (ECS) and ProLogix™ Communications Systems in private networks. In previous releases, this functionality is available using tie lines, but users handle calls between networked switches as outside calls. In this release, dialing the pool access code is not necessary for a call going from one networked switch to another. Also, delay-start tie trunks or T1 trunks administered as PRI can act as *tandem trunks* to connect networked systems.

  Available for Hybrid/PBX mode systems, the private network features of the MERLIN LEGEND Communications System Release 6.0 provide the following advantages for geographically dispersed organizational sites:

  – **Intersystem Calling**. In a private network, users on one local system can call extensions on other systems in the network. Release 6.0 can support 2-, 3-, 4-, or 5-digit dial plans. They dial these extensions as inside calls. To implement this function, the system manager programs the extension ranges of remote networked switches to create a non-local dial plan. This programming does not actually affect numbering on the remote system. To correctly set up systems for transparent calling among non-local dial plan extensions, the system manager assigns networking tie and/or PRI tandem trunks to pools. Then he or she programs up to 20 patterns, associated routes, Facility Restriction Levels (FRLs), digit absorption, and digit prepending. This allows ARS-like routing of non-local dial plan calls. In addition, system managers can control whether calling name, calling number, or both are shown at MLX display telephones for incoming calls across PRI tandem trunks.

- **Toll Savings**. Private networked trunks may allow you to realize significant cost savings on long-distance and toll calls by performing tandem switching in the following two ways:
  - Callers on a local system, or individuals dialing in to remote access at a local system, can reach the public switched telephone network (PSTN) via outside trunks connected to other systems in a private network, avoiding toll charges or decreasing the cost of toll calls. No special dialing is required. For example, an organization might have a main office in Boston and a subsidiary office in New Jersey connected by networked private tandem trunks between two systems. A user in the New Jersey office who wishes to make an outside call to the 617 area code (Boston) can do so through a line/trunk connected to the system in Boston. For example, he or she might dial, `916175551211`. The local ARS tables would route this call over the private networked trunks and use the ARS tables of the remote system in Boston to route this call. The system managers at each end of a private network set up ARS and Remote Access features to implement this functionality.
  - In addition, local organizations or incoming DID calls use private networked trunks to make intersystem calls between networked systems, which may be geographically distant from one another, also resulting in toll savings.
- **Service Cost Savings**. In addition to toll call savings, there are two ways that organizations can save on service costs incurred from telecommunications providers that provide public switched telephone network access:
  - You order a point to point T1 facility from a service provider, then use system programming to set it up for PRI signalling. As necessary, a service provider can provide amplification on the T1 facility, but does not supply switching services.
  - You can tailor your use of PRI B-channels with drop-and-insert equipment that allows fractional use of B-channels for dedicated data/video communications between systems at speeds greater than 64 kbps per channel or 128 kbps for 2B data, while keeping the remaining B-channels available for PRI voice traffic. The PRI D-channel must remain active.
  - You can tailor use of T1 channels to support both T1-emulated tandem tie service and T1 Switched 56 service for data communications at 56 kbps per channel, allowing 2B data transfers at 112 kbps. You can also use drop-and-insert equipment to provide fractional T1 use.
- **Voice Mail and Auto Attendant**. Networked systems (prior to Release 6.1) should have their own local voice mail and/or auto attendant applications as well as their own external alerts and Music-On-Hold sources. A single Auto Attendant, however, can transfer calls throughout the network. It can answer only those calls that arrive on the PSTN facilities of the system where it is connected.

Although many features are available using tie trunks for network connectivity, PRI tandem trunks provide greatly enhanced features and faster call setup. For this reason, PRI is recommended over tie functionality in private networks.

- **Group Calling Enhancements**

  Release 6.0 and later systems include Group Calling features that enhance group calling operations.

- **Queue Control**

  The system manager can control the maximum number of calls allowed in the primary calling group queue for calls that arrive on certain facilities often assigned to calling groups. When the number of the calls in queue reaches the programmed maximum, subsequent callers receive a busy signal.

  Queue control applies to calls received on the following types of facilities:

  — Direct Inward Dialing (DID)

  — PRI facilities programmed for dial-plan routing

  — All calls transferred from a voice messaging interface (VMI) port

  — Dial-in Tie

  Queue control also applies to internal calls to a calling group and calls to a calling group through the Queued Call Console (QCC).

  Internal calls that dial `#0` or `#800` and are directed to a calling group administered as Position-Busy Backup are eligible for queue control. Calls that come in on a trunk assigned to the QCC are not eligible for queue control if the call is directed to a calling group designated as Position-Busy Backup.

  Remote-access calls to a calling group, coverage calls directed to a calling group, calls directed to a calling group through QCC Position-Busy Backup, and all other outside calls are not eligible for queue control.

- **Prompt-Based Overflow**

  System managers can activate the Prompt-Based Overflow option. This option allows callers waiting in queue and listening to a delay announcement to press the # key in order to reach the overflow receiver for the group, which may be the QCC queue or another calling group (including a calling group assigned for a voice mail system).

  All three overflow distribution options—based on the number of calls, the time a caller has waited, and according to the caller's prompt—may be used at one time. In this case, time-based and number-of-calls based options take precedence over overflow distribution based on the caller's prompt.

  When prompt-based overflow distribution is used, an extra TTR must be provided for each delay announcement device assigned to the associated calling group. The delay announcement informs the caller of the # key option to exit the queue and leave rather than waiting for an agent. If no TTR is available when a calling group call arrives, the call is not sent to a delay announcement extension.

- **Centrex Transfer via Remote Call Forwarding**

  Centrex Transfer via Remote Call Forwarding can be used in all system modes of operation to send outside calls to a remote telephone number or another Centrex station. In this context, the term *outside calls* refers to calls from outside the communications system, which may originate at extensions in the Centrex system that are not connected to the local MERLIN LEGEND Communications System.

  An outside call that uses this feature is defined as a call that arrives on an analog Centrex loop-start line at the MERLIN LEGEND Communications System. It may arrive directly or be transferred without consultation or without transfer supervision (in the case of an automated attendant). The forwarding call to the outside number is made on the same line/trunk on which the call arrived, conserving system facilities. The following considerations and rules apply:

  — Only outside Centrex calls are forwarded using this feature.

  — The system must be equipped with analog loop-start Centrex lines and *all* loop-start lines in the system must be Centrex facilities. Loop-start lines do not have to provide reliable disconnect for use by the Centrex Transfer via the Remote Call Forwarding feature.

  — To transfer calls outside the Centrex system, the organization must subscribe to a Centrex trunk-to-trunk transfer feature.

  Activating Centrex Transfer via Remote Call Forwarding is just like activating regular Remote Call Forwarding and requires that Remote Call Forwarding be enabled for the extension. However, the user dials * instead of a dial-out code, and a Pause character may be required after the *. The Centrex service provider determines whether the Pause is needed.

  Pause cannot be originated from a single-line telephone or a remote access user. A multiline telephone user in the local system must enter an authorization code to activate the feature.

  A remote access user may activate the feature without using an authorization code. Barrier code requirements, however, do apply.

- **Authorization Codes and Remote Call Forwarding**

  In Release 6.0 and later Key or Hybrid/PBX mode systems, forwarding features (including Centrex Transfer via Remote Call Forwarding, but excluding Follow Me) can be activated or deactivated at a multiline telephone by entering the authorization code for the extension from which calls are to be forwarded. The user enters the authorization code, then activates or deactivates the forwarding feature in the normal fashion. This is especially useful for a single-line telephone user who must include a Pause character in a Centrex Transfer via Remote Call Forwarding dialing sequence, because the character cannot be dialed at a single-line telephone. It is also useful when activating Call Forwarding or Remote Call Forwarding at phantom stations or via remote access (for example, from another switch in the network). No other features can be used by entering an authorization code in this fashion.

Release 5.0 Enhancements (June 1997)

Release 5.0 includes all Release 4.2 functionality, plus the enhancements listed below.

- **Computer Telephony Integration (CTI)**

  Beginning with Release 5.0, a PassageWay® Telephony Services CTI link from the MERLIN LEGEND Communications System to a LAN server running Novell® NetWare® software allows Lucent Technologies-certified telephony applications to control and monitor MLX and analog multiline telephone (BIS only) operations. The physical connection for the CTI link is an MLX port on a 008 MLX or 408 MLX module on the MERLIN LEGEND Communications System control unit and an ISDN link interface card plugged into the customer's server. The feature is available for Hybrid/PBX mode systems only.

  NOTES:
  - The NetWare server software version must be 3.12, 4.1, or 4.11.
  - The 008 MLX and 408 MLX modules must have a firmware vintage other than 29. If the module has firmware 29, programming a CTI link on the module is prevented. An earlier or later vintage firmware is supported.

- **Basic Call Control**

  A CTI link application on a user's computer can assume basic call control of the user's analog multiline or MLX telephone's SA buttons. Basic call control includes:

  — Answering calls arriving on an SA button.

  — Making calls from an SA button.

  — Hanging up calls.

  — Holding and retrieving a call on hold at the user's extension.

  NOTE:
  Transfer and three-way conference, when handled through a CTI link application, provide the original caller's calling number information or other information to the transfer receiver or new conference participant, if the user has screen pop capability.

- **Screen Pop**

  Screen pop occurs when the calling number, called number, or other user-defined identifier (such as an account code that a voice-response unit prompts the caller to dial) is used to display a screen associated with the far-end party. For example, Caller ID services can be used to support screen pop on a system that includes a CTI link; using the calling party number as a database key code, information about a caller automatically appears on the user's computer screen when the call arrives at the extension. Depending on the application, screen pop may be available for calls that arrive on line buttons other than SA buttons and/or calls that are answered manually at the telephone rather than by the application.

  Screen pop can occur on incoming calls from the following sources:

- Calling group distribution.
- ISDN PRI Routing by Dial Plan.
- An extension on the MERLIN LEGEND Communications System.
- Remote access.

  NOTE:
  In the case of remote access calls, the only information that the application can collect about the caller is the remote telephone number.
- A transfer of a call that was answered by a voice response unit.
- A transfer, redirection, or conference of a call that was answered at a Direct-Line Console (DLC) or at a Queued Call Console (QCC).

  NOTES:
  - DLCs may use CTI applications. If they do, they perform the same way as other extensions. A DLC assigned to use a CTI link application is a monitored DLC. When a DLC is used as a regular operator console and is not using a CTI link extension, it is non-monitored.
  - Calls to a QCC or a DLC not using a CTI application do not initiate screen pop at the operator position. However, when an operator directs a call to an extension using a CTI application, caller information does initiate screen pop. If the DLC is non-monitored, screen pops can occur after the DLC releases the call.
  - Calls transferred from Cover buttons on non-monitored DLCs do not initiate screen pop at the destination extension.

■ **HotLine Feature**

The Release 5.0 HotLine feature is designed for retail sales, catalogue sales, and other types of businesses and organizations, and is available in all three modes of system operation. It allows a system manager to program a single-line telephone extension connected to an 008 OPT, 012, or 016 module as a HotLine. When a user lifts the handset at the HotLine extension, the telephone automatically dials the inside extension or outside telephone number programmed as the first Personal Speed Dial number (code #01) for the extension. The system does not permit calls to be transferred, put on hold, or conferenced. (A user can press the telephone's Hold button, if it has one, to put a call on local hold, but the call cannot be redirected in any way. Switchhook flashes are ignored.)

Personal Speed Dial codes can be programmed from the extension prior to HotLine assignment (a system programming function). Alternatively, a Personal Speed Dial code can be programmed from the single-line telephone after HotLine operation is assigned. However, because of security considerations, this is a one-time opportunity. Once the Personal Speed Dial number is programmed, any changes to it or any other extension programming must be performed using centralized telephone programming.

Any type of inside or outside line that is normally available to a single-line telephone can be assigned to a HotLine extension. Generally, the HotLine telephone does not receive calls, and its lines should be set to No Ring.

SECURITY ALERT:

If a HotLine extension accesses a loop-start line, that line should provide reliable disconnect and be programmed for reliable disconnect. Otherwise, a user at the extension may be able to stay on the line after a call is completed and then make a toll call.

- **Group Calling Enhancements**

Release 5.0 and later systems include Group Calling features that enhance group calling operations.

- **Most Idle Hunt Type**

In addition to the Circular (factory setting) and Linear hunt types supported in earlier releases, a third hunt type distributes calling group calls in an order based on which agent has waited the longest since transferring or hanging up on an incoming calling group call. For some applications, this hunt type is more efficient than the circular type because it takes into account the varying duration of calls. The system distributes calls based on when an agent last completed a call, not on when he or she last received one. This hunting method ignores non-calling group calls. For example, if an agent transfers a call that arrived on a line not assigned to the calling group, the calling group member's most-idle status is unaffected.

- **Delay Announcement Devices**

The system manager can designate as many as ten primary delay announcement devices per group, rather than the single device for each group that is available in Release 4.2 and earlier systems. Furthermore, an additional secondary delay announcement device can be specified, for a total of ten primary device extensions and one secondary device extension per group.

A primary delay announcement device operates in the same fashion as a single delay announcement device, playing once, as soon as it is available, for the caller who has waited the longest for a calling group agent and has not heard a primary delay announcement. If a secondary announcement device is used, it can use the factory setting, which plays the announcement once, or it can be set to repeat the announcement after a certain amount of time. The system manager programs the time (0–900 seconds) between announcements. This setting controls both the interval between primary and secondary announcements and the interval between repetitions of the secondary announcement, if it is set to repeat. (See "Calling Group Options" in Chapter 4 of *System Planning* for guidelines on setting the delay.)

The primary and secondary announcement options, when used together, allow an initial message to play for callers, followed by a repeating announcement that, for example, urges callers to stay on the line and wait for a calling group member.

Two or more groups may share an announcement device.

A primary delay announcement device can be programmed as a secondary delay announcement device.

- **Enhanced Calls-in-Queue Alarm Thresholds**

Three Calls-in-Queue Alarm thresholds can be set to more clearly indicate the real-time status of the calls waiting in the queue according to the behavior of programmed Calls-in-Queue Alarm buttons. In earlier releases, only one Calls-in-Queue Alarm Threshold setting is available to activate the LEDs at programmed Calls-in-Queue Alarm buttons for a calling group.

Using all three levels, the system manager sets Threshold 3 to the highest value, Threshold 2 to a middle value, and Threshold 1 to the lowest value. A Calls-in-Queue Alarm button indicates the severity of the alarm conditions in the following ways:

- If the number of waiting calls is less than the value programmed for Threshold 1 or drops below that level, the LED is unlit.
- If the number of waiting calls is greater than or equal to the Threshold 1 value but less than the Threshold 2 value, the LED flashes.
- If the number of waiting calls is greater than or equal to the Threshold 2 value but less than the value for Threshold 3, the LED winks.
- If the number of waiting calls is greater than or equal to the highest value, Threshold 3, the LED lights steadily.

NOTE:
A Direct Station Selector (DSS) button that is used as a Calls-in-Queue Alarm button can only indicate two threshold levels, either by flashing or by lighting steadily. If a calling group must use this type of Calls-in-Queue Alarm button, only two threshold levels should be programmed.

If all three thresholds are set to the same value, the result is one threshold only with LED state either off or on (steady). If two values are the same, then the result is two alarm levels (flash, steady). The factory setting is one call for all three thresholds, with LED states of off and steady.

An external alert signals only when the number of calls in the queue meets or exceeds the programmed Threshold 3 value.

- **MLX-5 and MLX-5D Telephones**

The MLX-5 nondisplay and MLX-5D display telephones are compatible with all system releases. The display telephone includes a 2-line by 24-character display, and both telephones come with five line buttons. In systems prior to Release 5.0, the MLX-5 and MLX-5D telephones are treated as MLX-10 and MLX-10D telephones, respectively. As of Release 5.0, the system recognizes the MLX-5 and MLX-5D telephones as 5-button telephones.

If these telephones are connected to communications system releases prior to 5.0, they are recognized by the communications system as 10-button telephones.

Release 4.2 Enhancements (June 1997)

Release 4.2 includes all Release 4.1 functionality, plus the enhancements listed below. There are no hardware changes for Release 4.2.

- **Additional Network Switch and Services Options for ISDN Primary Rate Interface (PRI)**

  Release 4.2 of the system supports connectivity to MCI® or local exchange carrier (LEC) PRI services and to the following central office switch types (in addition to the 4ESS™ and 5ESS® switch types that carry AT&T Switched Network services):

  - NORTEL® DMS™-100 BCS 36 for local exchange carrier services.
  - NORTEL DMS-250 generic MCI07, serving the MCI network.
  - Digital Switch Corporation DEX600E generic 500-39.30, serving the MCI network.

    Beginning with Release 4.2, the following MCI PRI and PRI local exchange carrier (LEC) services (along with AT&T Switched Network services) can be provided to users of the MERLIN LEGEND Communications System:

  - MCI Toll Services for DMS-250 or DEX600E switch type:
    - MCI Prism® service for domestic outgoing long-distance and international voice calls; for domestic outgoing 56-kbps restricted, 64-kbps unrestricted, and 64-kbps restricted circuit-switched data calls.
    - MCI VNet® service for incoming and outgoing domestic and voice calls; for 56-kbps restricted, 64-kbps restricted, and 64-kbps unrestricted circuit-switched data calls.
    - MCI 800 for domestic, toll-free incoming voice calls.
    - MCI 900 service numbers.
  - LEC services for DMS-100 switch types:
    - DMS Virtual Private Network service for calls between the MERLIN LEGEND Communications System and another communications system (such as another MERLIN LEGEND Communications System).
    - DMS INWATS (Inward Wide Area Telephone Service) for domestic toll-free incoming voice calls.
    - DMS OUTWATS (Outward Wide Area Telephone Service) for domestic outgoing long-distance voice calls.
    - DMS FX (foreign exchange) to provide local call rating for calls from the local exchange to the area serviced by the foreign exchange.
    - DMS tie trunk service to provide private exchange call rating for calls placed on a dedicated central office facility between the MERLIN LEGEND Communications System and another communications system.

- **Improvements to Station Message Detail Recording (SMDR) and Support for MERLIN LEGEND Reporter Application**

  The SMDR feature is enhanced to provide more details about calling group agent activities and to help system managers assess the effectiveness of call centers in terms of both agent performance and the adequacy of facilities to handle inbound calls. These improvements apply to calling groups that are programmed as Auto Login or Auto Logout type. The SMDR and MERLIN LEGEND Reporter features listed are administrable:

  - **TALK Field**. For Auto Login and Auto Logout calling groups, the TALK field records the amount of time a calling group agent spends on a call.
  - **DUR. (DURATION) Field**. For Auto Login and Auto Logout calling groups, call timing begins when a call arrives at the MERLIN LEGEND Communications System and not after a preset number of seconds. Call timing ends when the call is disconnected; either the caller or the agent hangs up. This allows the system manager to determine how long a caller waited for an agent's attention.
  - **Coding of Calls on Reports**. An asterisk (*) appears in the call record when:
    - A call is not answered by an Auto Login or Auto Logout calling group agent and is abandoned while waiting for an agent.
    - The call is answered by someone not a member of an Auto Login or Auto Logout calling group.
      An exclamation point (!) signals that an Auto Login or Auto Logout agent handled a call that was answered by someone who was not a member of that Auto Login or Auto Logout with Overflow group. An ampersand (&) in the call record indicates that the group's overflow receiver answered the call.

- **MERLIN LEGEND Reporter**

  MERLIN LEGEND Reporter provides basic call accounting system reports for all incoming calls to Auto Login or Auto Logout type calling groups. MERLIN LEGEND Reporter assists in determining the effectiveness of calling group agents, assessing the level of service provided to callers, and ascertaining whether adequate incoming telephone lines and agents are available to handle peak-call load. The SMDR Talk Time option sets up special call records used by MERLIN LEGEND Reporter. The default is off, in which case the Release 4.0 SMDR reports are available. If the option is set to on, the following new reports are provided:

  - Organization Detail Report
  - Organization Summary and Trends Report
  - Selection Detail Report
  - Account Code Report
  - Traffic Report
  - Extension Summary Report

- Data Report
- Talk and Queue Time Distribution Report
- Time of Day Report
- ICLID Call Distribution Report
- Facility Grade-of-Service Report

■ **Maintenance Enhancements**

■ **Change to Permanent Error Alarm**

Beginning with Release 4.2, the most recent permanent error alarm is not shown on the System Error Log menu screen but is available as an option from that screen. For details, refer to the maintenance section of the technician guide, *Installation, Programming, and Maintenance.*

■ **Enhanced Extension Information Report**

Beginning with Release 4.2, the Extension Information Report includes the Extension Status and supervisory mode of each extension.

Release 4.1 Enhancements (June 1997)

Release 4.1 includes all Release 4.0 functionality, plus the enhancements listed below. There are no hardware changes in Release 4.1.

■ **Coverage Timers Programmed for Individual Extensions**

Beginning with Release 4.1, coverage timers, which control the duration of the delay before calls are sent to each level of coverage, are changed as follows:

- The Group Coverage Ring Delay (1–9 rings) is programmed on individual extensions and replaces the Coverage Delay Interval programmed systemwide in previous releases.
- The Primary Cover Ring Delay (1–6 rings) and Secondary Cover Ring Delay (1–6 rings), programmed on individual extensions, replace the Delay Ring Interval programmed systemwide in previous releases.

These enhancements allow the system manager to customize coverage call delivery to match individual extensions' call-handling requirements.

■ **Night Service with Coverage Control**

Beginning with Release 4.1, a system manager can enable the Night Service Coverage Control option to automatically control the status of telephones programmed with Coverage VMS (voice messaging system) Off buttons, according to Night Service status.

When Coverage Control is enabled and the MERLIN LEGEND Communications System is put into Night Service, all programmed Coverage VMS Off buttons are automatically turned off (LED is unlit) and all eligible outside calls are sent to the assigned voice messaging system calling group with normal ringing delay. When Night Service is deactivated during the day, all programmed Coverage VMS Off buttons are automatically turned on (LED is lit) and voice mail coverage is disabled for outside calls.

Users can override the Coverage VMS Off button status at any time by pressing the programmed Coverage VMS Off button to turn the LED on or off.

- **Night Service Group Line Assignment**

  Beginning with Release 4.1, a system manager can assign lines to Night Service groups to control handling of after-hours calls received on individual lines. This capability replaces the automatic assignment to Night Service groups of only those lines that ring on the Night Service operator console. An outside line must be assigned to a Night Service group to receive Night Service treatment.

  With this enhancement, Night Service can be activated and deactivated on lines that do not appear on operator consoles (for example, personal lines), and lines appearing at operator positions can be excluded from Night Service.

- **Forward on Busy**

  Beginning with Release 4.1, the Forward, Follow Me, and Remote Call Forward features are enhanced to remove the requirement that a call be ringing at an extension before it can be forwarded. With the Forward on Busy enhancement, a call to an extension with no available SA or ICOM buttons is forwarded immediately to the programmed destination, preventing the caller from hearing a busy signal from the intended call recipient's extension.

- **Maintenance Testing for BRI Facilities that Are Part of Multiline Hunt Groups (MLHGs)**

  Beginning with Release 4.1, the NI-1 BRI (National Integrated Services Digital Network-1 Basic Rate Interface) Provisioning Test Tool is enhanced to include testing for BRI facilities that are part of Multiline Hunt Groups (MLHGs).

  The NI-1 BRI Provisioning Test Tool is used by Lucent Technologies maintenance personnel on MERLIN LEGEND Communications Systems that include an 800 NI-BRI module. Technicians use the tool during system installation and maintenance to test the functionality of the BRI lines and to report analyzed results.

Release 4.0 Enhancements (March 1996)

Release 4.0 includes all Release 3.1 functionality, plus the enhancements listed below.

- **Support for Up to 200 Extensions**

  An expanded dial plan supports up to 200 tip/ring devices.

- **Support for National ISDN BRI Service**

  This service (Hybrid/PBX and Key modes) provides an alternative to loop-start and ground-start lines/trunks for voice and digital data connectivity to the central office. Each of the two B-channels (*bearer channels*) on a BRI line can carry one voice and one data call at any given time. The data speeds on a B-channel are up to 28.8 kbps for analog data and up to 64 kbps for digital data, which is necessary for videoconferencing and other high-speed applications. Release 4.0 supports the

ISDN Ordering Code (IOC) Package “S” (basic call handling) service configuration and Multiline Hunt service configuration on designated central office switches.

- **New Control Unit Modules**

  Release 4.0 supports a new NI-BRI line/trunk module and a higher-capacity tip/ring module.

- **800 NI-BRI Module**

  This new module connects NI-BRI trunks to the MERLIN LEGEND System for voice, high-speed data, and video transmission.

- **016 Tip/Ring Module**

  This new module supports a 200-extension dial plan by providing 16 ports for tip/ring devices. Applications that use a tip/ring interface can connect to this board. All 16 ports can ring simultaneously. Four touch-tone receivers (TTRs) are included on the module as well. The module’s ringing frequency (default 20 Hz) can be changed, through programming, to 25 Hz for those locations that require it.

- **Downloadable Firmware for the 016 (T/R) and NI-BRI Modules**

  The Personal Computer Memory Card International Association (PCMCIA) technology, introduced in Release 3.0, continues to support these two modules for installation and upgrade in Release 4.0. A Release 3.0 or later processor is required for PCMCIA technology.

- **Support for 2B Data Applications**

  A Lucent Technologies-certified group and desktop video application can use two B-channels to make video/data calls when connected to a single MLX extension jack programmed for 2B data. The 2B data devices must be equipped with ISDN-BRI interfaces. NI-1 BRI, PRI, or T1 Switched 56 facilities support 2B data communications at 112 kbps (using two 56-kbps channels) or 128 kbps (using two 64-kbps B-channels). This feature is available for Hybrid/PBX and Key modes only.

- **Support for T1 Switched 56 Digital Data Transmission**

  For Hybrid/PBX and Key mode systems, Release 4.0 expands support of T1 functionality by providing access to digital data over the public switched 56-kbps network, as well as to digital data tie-trunk services. Users who have T1 facilities for voice services can now use them for video or data calls at rates of 56 kbps per channel (112 kbps for video calls using 2B data). The Release 4.0 offering also includes point-to-point connectivity over T1 tie trunks, allowing customers to connect two MERLIN LEGEND Communications Systems or a MERLIN LEGEND Communications System with a Lucent Technologies DEFINITY G1.1 Communications System or DEFINITY Enterprise Communications Server. The two communications systems can be co-located or can be at different sites.

- **Forwarding Delay Option**

  Each user can program a Forwarding Delay setting for the Forward, Remote Call Forwarding, or Follow Me features. The forwarding delay is the number of times that a call rings at the forwarding extension before the call is sent to the receiver. The delay period gives the original call recipient time to answer or to screen calls by checking the displayed calling number (if available). The delay can be set from 0 to 9 rings. The factory setting for the forwarding delay is 0 rings (no delay).

- **Voice Announce on Queued Call Console**

  The system manager can enable the fifth Call button on a QCC console (Hybrid/PBX mode only) to announce a call on another user's speakerphone (providing the destination telephone has a voice announce-capable SA button available). A QCC cannot receive voice-announced calls; they are received as ringing calls. The factory-set status for the fifth Call button is voice announce disabled.

- **Time-Based Option for Overflow on Calling Group**

  Release 4.0 has added a *time* limit for calls in queue in addition to the previous *number of calls* limit. If the Overflow Threshold Time option is set to a valid number between 1 and 900 seconds, calls that remain in the calling group queue for the set time are sent to the overflow receiver. If the overflow threshold time is set to 0, overflow by time is turned off. The factory-set time limit is 0 seconds (off).

- **Single-Line Telephone Enhancements**

  The following changes enhance the performance of single-line telephones:

  — **Disable Transfer**. Through centralized telephone programming, the system manager can disable transfer by removing all but one SA or ICOM button from the extension.

  — **No Transfer Return**. When a handset bounces in its cradle, the system interprets this as a switchhook flash and attempts to transfer a call. When the transfer attempt period expires, the user's telephone rings. Release 4.0 eliminates this unintended ringing by disconnecting the call in situations where a switchhook flash is followed by an on-hook state and a dial tone is present.

  — **Forward Disconnect**. All ports on 008 OPT, 012, and 016 modules now send forward disconnect to all devices connected to them when forward disconnect is received from the central office. This enhancement prevents the trunk/line from being kept active when one end disconnects from the call. If an answering machine is connected to the port, it does not record silence, busy tones, or other useless messages. This operation is not programmable.

- **Seven-Digit Password for SPM**

  Release 4.0 has increased system security by requiring a 7-digit password for system managers or technicians who use System Programming and Maintenance (SPM) to perform programming or the Trunk Test procedure. This password is for use in addition to a remote access barrier code.

Release 3.1 Enhancements (March 1996)

Release 3.1 includes all Release 3.0 functionality, plus the enhancements listed below.

- **Call Restriction Checking for Star Codes**

  Beginning with Release 3.1, a system manager can add star (*) codes to Allowed and Disallowed Lists to help prevent toll fraud. Star codes, typically dialed before an outgoing call, enable telephone users to obtain special services provided by the central office. For example, in many areas, a telephone user can dial *67 before a telephone number to disable central office-supplied caller identification at the receiving party's telephone. You must contract with your telephone service provider to have these codes activated.

  When users dial star codes, the system's calling restrictions determine whether the codes are allowed. If they are allowed, the system's calling restrictions are reset, and the remaining digits that the users dial are checked against the calling restrictions.

- **Trunk-to-Trunk Transfer Set for Each Extension**

  This enhancement to the Transfer feature enables the system manager to allow or disallow trunk-to-trunk transfer on a per-extension basis. In Release 3.1 and later systems, the default setting for all extensions is restricted.

- **Programmable Second Dial Tone Timer**

  The system manager can assign a second dial tone timer to lines/trunks, in order to help prevent toll fraud (for example, when star codes are used). After receiving certain digits dialed by a user, the central office may provide a second dial tone, prompting the user to enter more digits. If this second dial tone is delayed, and the user dials digits before the central office provides the second dial tone, there is a risk of toll fraud or misrouting the call. The second dial tone timer enables the system manager to make sure that the central office is ready to receive more digits from the caller.

- **Security Enhancements**

  The sections below outline security measures that are implemented in Release 3.1 and later systems.

- **Disallowed List Including Numbers Often Associated with Toll Fraud**

  A factory-set Disallowed List 7 contains default entries, which are numbers frequently associated with toll fraud. By default, Disallowed List 7 is automatically assigned to both generic and integrated voice messaging interface (VMI) ports used by voice messaging systems. The system manager can manually assign this list to other extensions.

- **Default Pool Dial-Out Code Restriction for All Extensions**

  The default setting for the pool dial-out code restriction (Hybrid/PBX mode only) is restricted. No extension or remote access user with a barrier code has access to pools until the restriction is removed by the system manager.

- **Default Outward Restrictions for VMI Ports**

  Ports assigned for use by voice messaging systems (generic or integrated VMI ports) are now assigned outward restrictions by default. If a voice messaging system must be allowed to call out (for example, to send calls to a user's home office), the system manager must remove these restrictions.

!SECURITY ALERT:

Before removing restrictions, it is strongly recommended that you read Appendix A, "Customer Support Information," in System Programming.

- **Default Facility Restriction Level (FRL) for VMI Ports**

  The default Automatic Route Selection (ARS) FRL for VMI ports is 0, restricting all outcalling.

- **Default for the Default Local Table**

  The default Automatic Route Selection (Hybrid/PBX mode only) FRL has changed to 2 for the Default Local table. System managers can easily change an extension's default FRL of 3 to 2 or lower to restrict calling. No adjustment to the route FRL is required.

- **New Maintenance Procedure for Testing Outgoing Trunks**

  Technicians must enter a password in order to perform trunk tests.

!SECURITY ALERT:

The enhancements in Release 3.1 help increase the security of the MERLIN LEGEND System. To fully utilize these security enhancements, be sure to read and understand the information in these upgrade notes and in the relevant system guides.

Release 3.0 Enhancements (August 1994)

Release 3.0 includes all Release 2.1 functionality plus the enhancements listed below.

- **Equipment**

  New hardware includes a variety of components. Additional details are included elsewhere in this book.

  - CPU modifications include:
    - A processor running at 16 MHz with a 32-bit wide data bus.
    - 1.5 MB of non-volatile (battery-backed) RAM.
    - 4.0 MB of Flash ROM.
    - PCMCIA memory card interface.
    - A full-duplex 1200/2400 bps modem.
    - Error/Status code display for maintenance support.
  - An 800 GS/LS-ID line/trunk module delivers the calling party's telephone number to the customer premises (MLX display telephones only) if the service is subscribed to by the customer and if it is supported by the caller's telephone company.
  - Support for:
    - MDC 9000 (six-line, cordless).
    - MDW 9000 (six-line, cordless, wireless).
    - 8101 (single-line telephone, desk or wall-mount, data/fax jack, selectable positive disconnect).
    - 2500YMGL and 2500 MMGL (single-line desk telephones, selectable positive disconnect).
    - Picasso™ Still-Image telephone (for interactive display of still images).
    - Videophone 2500 single-line telephone with interactive video display
  - Pre-fabricated and pre-drilled backboard.

- **Installation, Upgrade Administration, and Maintenance**

  These are the new MERLIN LEGEND Communications System capabilities:

  - SPM (Release 3.18) conversion of translations from Release 1.0, 1.1, 2.0, and 2.1 to 3.0.
  - Remote operation at 1200/2400bps.
  - Advice and feedback administration screens for new Release 3.0 functionality.
  - PCMCIA Memory Card Interface (a Release 3.0 processor board required) allowing:
    - System software installation.
    - System software upgrade.
    - 800 GS/LS-ID port module firmware upgrade.
    - Integrated backup and restore of translations.
    - Automatic and manual options for backup and restore are available on the system. Automatic backup can be scheduled weekly or daily to fit the customer's needs.
  - Inter-digit dialing timer values are programmable.

- Inspection of Lines/Trunks displays only those lines and trunks configured on system rather than all 80 facilities.
- Extensions and facilities in Maintenance Busy (both manual and automatic) can be identified by the maintenance monitor.

■ **User Features**

- **Security**. The Remote Access feature allows people at remote locations to enter the system by dialing the number of a line or trunk designated for remote access. The system can be programmed to require the remote user to dial a barrier code (a type of password) after reaching the system. In earlier versions, the systemwide barrier code length is fixed at four digits. Release 3.0 allows a systemwide barrier code length ranging from a minimum of four digits to a maximum of 11 digits, with a factory setting of seven digits. SMDR records are enhanced to provide information for remote access calls. If the remote access call is received on a facility providing Caller ID information (see below), the SMDR report can help trace the call.
- **Caller ID.** Caller information (telephone number) is furnished to MLX display telephones by an 800 GS/LS-ID module using the LS (loop-start) option. This allows customers to screen calls before answering the telephone, as well as providing calling party information for use with various applications. This function is available only when the customer subscribes to caller identification service from the telephone company, if the telephone company supports that service.
- **Shared System Access (SSA).** A telephone may have up to 27 Shared SA buttons to expand extension coverage.
- **Authorization Codes**. The Authorization Code feature allows you to make calls using your calling privileges when you are dialing from an extension other than your own. When you enter your authorization code (ranging from 2 to 11 characters and unique across the system), the privileges and restrictions assigned to your home extension override the current restrictions at the host extension. This includes toll restriction, outward restriction, Facility Restriction Level (FRL), Allowed Lists, Disallowed Lists, Night Service Exclusion List, and Dial Access to Pools. All other functions on the telephone are those of the local telephone, not the home extension.
  Authorization codes can also be used for the purpose of call accounting through the SMDR printout. The SMDR account code field can hold either the authorization code extension number or the authorization code itself.
- **Direct Voice Mail**. If your company has voice mail, this feature allows you to dial a co-worker's voice mailbox directly without ringing that person's extension. Direct Voice Mail is especially useful for transferring calls when a co-worker is not available.

- **Additional Features**

  The status of Leave Word Calling (LWC) and Privacy are retained across cold starts.

  Caller ID (CLASS[SM] ICLID and PRI) are available on primary coverage and return from transfer.

- **Additional Application Packages, Adjuncts, and Adapter Enhancements**
  - **PassageWay Direct Connection Solution**. PassageWay Direct Connection Solution (Release 2.0) is a computer telephony integrated product that links a desktop Microsoft® Windows®-based PC to the MERLIN LEGEND Communication System's MLX-10DP, MLX-20L, or MLX-28D telephone. The Windows applications are: AT&T Call (autodial/contact manager), AT&T Buzz (screen pops applications), AT&T Set (extension programming interface), and Log Viewer (call log application). PassageWay Direct Connection Solution (Release 2.0) is the version supported on MERLIN LEGEND Communications System Release 3.0.
  - **PagePal™**. PagePal connects several paging systems to the MERLIN LEGEND Communications System. No other system adapter is necessary for loudspeaker paging.
  - **Fax Attendant 2.1.1**. Fax Attendant Release 2.1.1, which co-resides with AUDIX Voice Power on the IS III Release 1.2 platform, provides the same functionality as earlier versions, plus the following enhancements:
    - **Personal Fax Messaging**. Inbound faxes can be stored until the subscriber asks that they be printed, at any fax machine he or she specifies, on company premises or offsite (when the subscriber retrieves fax messages remotely).
    - **Fax Mail**. Allows subscribers to send fax messages, get fax messages, record personal greetings, and program outcalling.
    - **Fax Broadcast**. Provides a simple way to send one fax to as many as 1000 fax numbers.
- **Call Accounting System (CAS) for Windows**

  This stand-alone version of CAS takes advantage of the easy-to-use graphical environment offered by Microsoft Windows. Through data communications, it also allows one CAS system to serve multiple business sites.

- **Group Videoconferencing**

  Group videoconferencing is supported over DS1 (Digital Signal Level 1) facilities with PRI. (Videoconferencing has been available since Release 2.0.)

Release 2.1 Enhancements (August 1994)

Refer to *Release 2.1* Notes for detailed descriptions of Release 2.1 enhancements. Release 2.1 includes all Release 2.0 functionality plus the enhancements listed below.

- **Operational**

  System operational enhancements include the following:

  - When a call is forwarded to a multiline telephone that has an Auto Dial or DSS button programmed for the forwarding telephone, the green light next to the Auto Dial or DSS button for the forwarding telephone does not flash.
  - People answering calls received on Cover buttons are allowed to generate touch tones if their telephones are not outward- or toll-restricted.
  - Calls received on personal lines with Do Not Disturb on go immediately to coverage instead of waiting for the coverage delay interval.
  - A call put on hold at a Cover button can be added to a conference by someone who has a personal line for the call.
  - A call put on hold at a Cover button can be picked up by any person who has a personal line for the call.
  - Calls that have been put on hold at a Cover, SA, Shared SA, or Pool button can be picked up by a person who has a personal line button for the call.
  - An inside call on hold at an SA button can be picked up and transferred by any person with a Shared SA button corresponding to the button with the held call.
  - Calls that are on hold awaiting transfer can be picked up by any user who has a personal line for the call.
  - Beginning with Integrated Solution III Version 1.2, the automatic reconciliation program that was run automatically at 3:00 a.m. is disabled and can be invoked manually from the User Maintenance menu.
  - If an extension is programmed for Forced Account Code Entry, account codes do not have to be entered when using a programmed Loudspeaker Paging button. In addition, an SMDR record is not generated for calls made to paging ports.
  - When an MLX telephone, other than an MLX-20L, is plugged into an MLX port and the Personal Directory does not contain any entries, the allocation of the Personal Directory resource is released. If there are any entries in the Personal Directory, the Personal Directory allocation and the entries in the Personal Directory are saved in the MLX port.
  - SMDR call records for calls made on PRI facilities are more accurate than SMDR call records for calls made on non-PRI facilities. Outgoing calls made on PRI facilities receive “answer supervision.” Consequently, SMDR timing for calls made on PRI facilities begins when the call is answered. Timing for calls made on non-PRI facilities begins when dialing is completed. Therefore, an SMDR call record is not generated when a call made on a PRI facility is not answered at the far end.

- The Call Type field and the Called Number field on the SMDR report are changed for both the Basic and ISDN report formats.
- An 012 port that is programmed as a generic voice messaging interface (VMI) port can transfer an outside call to an outside number.
- In a system where the transfer audible option is programmed for Music-On-Hold and a music source is provided, outside callers who are transferred to a calling group and are waiting in the queue or who are parked or camped-on, hear music while they are waiting. Internal callers never hear music on hold while waiting in the calling group queue or when they are parked, camped-on, or being transferred to another extension.

■ **Installation and Hardware**

Installation and hardware enhancements include the following:

- The control unit covers for the MERLIN LEGEND Communications System are the same easy-to-use covers as those for the MERLIN II Communications System.
- A new 012 (tip/ring) module [apparatus code 517G13 (28) or higher letter] contains a built-in ring generator. The maximum ring equivalency number (REN) supported is 2.2, and the module will ring four ports at one time. Bridging of single-line telephones is not supported because of poor transmission quality.
- A new 008 OPT module (labeled “with RING GEN.”) contains a built-in ring generator. It rings four ports at a time.
- Ferrite cores for the power supply modules are shipped from the factory to comply with FCC Part 15 requirements.
- 3129-WTWA (touch tone outdoor telephone equipped with cast aluminum housing and armored handset cord with bell ringers)
- 3129-WRWA (rotary dial outdoor telephone equipped with cast aluminum housing and armored handset cord with bell ringers).
- 3129-WAWA (auto dial outdoor telephone equipped with cast aluminum housing and armored handset cord with bell ringers).
- 3129-WNWA (nondial, automatic ringing on dedicated circuit outdoor telephone equipped with cast aluminum housing and armored handset cord with bell ringers).

■ **Equipment and Operations**

Equipment and operations enhancements include the following:

- A new release (Version 2.16) of the System Programming and Maintenance (SPM) software to support international use.
- Support of PRI connection to DEFINITY, Communications Systems
- MLX-10DP telephone, identical to an MLX-10D, except that it provides a jack for access to the PassageWay™ Solution and PassageWay Direct Connection Solution application.

- **Additional Application Packages, Telephones, Adjuncts, and Adapter**

  Additional application packages, adjuncts, and adapter enhancements include the following:

  - A Digital Announcer Unit, compatible with all call management systems and tip/ring applications currently available for the MERLIN LEGEND Communications System.
  - The HackerTracker™ system software enhancement to the Call Accounting System (CAS) detects abnormal calling activity by allowing monitoring of facilities or authorization code usage.
  - A new digital Magic On Hold unit is available in three configurations:
    - Basic Prerecorded Package
    - Personalized Package
    - Custom Production Package
  - The MERLIN® Identifier application enables people to receive, store, and use information provided by the local telephone company, specifically, the telephone number of a caller in an area where the service is also supported.
  - An Off-Premises Range Extender (OPRE) supports off-premises operation with an off-premises extension capability and extended range operation for tip/ring devices as well as variable gain to improve voice transmission levels.
  - PagePac® Plus Loudspeaker Paging Systems do not require system adapters. The controller provides eight built-in zones (expandable to 56 zones by using up to three 16-zone expansion units), group zones, talkback, night bell, operator override, tones, door supervision, microphone input, and system access security codes as standard features.
  - PassageWay Solution (Release 1.0) software consisting of four applications that run with Microsoft® Windows™ 3.1 or later and provide an interface between an IBM®-compatible personal computer and the MERLIN LEGEND Communications System.
  - Four single-line telephones with memory buttons: 710, 715, 725, and 730.
  - Four specialty handsets compatible with all MLX telephones and the 3101 series, 3178-NHL, 8102, and 8110 single-line telephones.

Release 2.0 Enhancements (October 1992)

Refer to *Release 2.0 Notes* for detailed descriptions of Release 2.0 enhancements. Release 2.0 includes all Release 1.1 functionality plus the enhancements listed below.

- **Programming**

  Programming enhancements include the following:

  - Extension Copy is a feature that reduces programming time by allowing the use of any extension as a template for programming another extension or block of extensions through centralized telephone programming.
  - Integrated Administration provides a single interface through Integrated Solution III (IS III) for programming entries common to the MERLIN LEGEND Communications System and AUDIX™ Voice Power.
  - Any SPM Version 2.xx (where xx is replaced by numbers) provides a Convert function for use in upgrading the system from Release 1.0 or 1.1. This function converts a backup file from a Release 1.0 or 1.1 system to Release 2.0 and later format, allowing reuse of existing system programming on the upgraded system.
  - Forced idle reductions keep system interruptions at a minimum. In general, the smallest necessary component is forced idle during programming activities. For example, renumbering a single extension idles only one extension. Only a few systemwide programming activities, such as setting the system mode and system renumbering, idle the entire system.

- **Operational**

  - System operational enhancements include the following:
  - Coverage VMS Off is a feature that prevents incoming outside calls from going to voice mail. (All other coverage remains active as programmed.) The feature is programmed extension by extension, either through extension programming or through centralized telephone programming.
  - A Night Service group can be programmed to include either extensions or a calling group as members. You should not program both individual extensions and a calling group into the Night Service group, however, because individuals will not have a chance to answer before calling group members do.
  - When AUDIX Voice Power sends a Leave Message notification to an extension, the system identifies the voice mail system as the sender of the message. When the voice mail subscriber uses the Return Call feature, the call goes to any available voice mail port, not just to the specific port that generated the message. This reduces the chance of getting a busy port.
  - Coverage receivers can call coverage senders and have the call receive coverage treatment. If a receiver calls a sender for whom he or she is covering, and the sender is busy or unavailable, the call proceeds to other points of coverage. It does not come back to the receiver who originated the call.

- Enhancements to display prompts include automatic posting of a Do Not Disturb message (for MLX display telephones or other multiline telephones, a Posted Message button must be programmed for the Do Not Disturb message to be posted automatically) when a user activates the Do Not Disturb feature, and confirmation messages when a user activates Hold, Privacy, Saved Number Dial, and Transfer.
- Direct Inward Dialing (DID) trunk emulation on a T1 facility provides up to 24 DID channels on a single DS1 interface, instead of requiring 24 separate physical trunks.
- A telephone user can send a timed flash (switchhook flash) on a loop-start trunk call on a System Access (SA) button.

■ **Fax Attendant System™**

Fax Attendant is an application for sending and receiving fax messages; its interface is similar to the voice mail interface provided by AUDIX Voice Power. Fax Attendant System, which co-resides with AUDIX Voice Power on the IS III platform, provides the following services:

- **Fax Call Coverage**. Receives and holds messages for subscribers whose fax machines are busy or out of paper. This service also allows a subscriber to have a personal fax number without having a fax machine.
- **Fax Mail.** Allows subscribers to create and use fax distribution lists, send and receive fax messages, and record personal greetings for incoming fax calls.
- **Fax Response**. Prompts callers to select and receive faxes from a customer-created menu of choices, using touch-tone responses.

■ **408 GS/LS-MLX Module**

The 408 GS/LS-MLX module (Releases 2.0 and later only) combines four line/trunk jacks for ground-start or loop-start trunks and eight extension jacks for MLX telephones on a single module in the control unit.

■ **Primary Rate Interface (PRI)**

Primary Rate Interface (PRI) enhancements include the following:

- Connectivity to the 5ESS® Generic 6
- Multiple incoming calls to directory number
- Call-by-Call Service Selection
- Password handling for FTS2000
- Extension ID as Calling Party Number for Automatic Number ID (ANI)

■ **Maintenance**

Maintenance enhancements include the following:

- Clear descriptions of module test failures
- Optional printing of hard copy of error logs
- Display that correlates extension numbers with slot/port and logical ID
- Display showing which slots, trunks, and extensions are maintenance busy

- Internal digital switching element (DSE) loopback test for all modules
- B-channel loopback test for MLX modules
- B-channel line or call service states display
- Error log entries for dual-port RAM errors

Release 1.1 Enhancements (October 1992)

Refer to *Release 1.1 Notes* for detailed descriptions of Release 1.1 enhancements. Release 1.1 includes all Release 1.0 functionality plus the enhancements described in the following sections.

- **Language Selection**

  This selection allows you to program the system for the display of prompts, menus, and messages on MLX display telephones in English, French, or Spanish. You can also program the following options in any of these languages, independently of the system language:

  - Individual extensions with MLX telephones
  - System Programming and Maintenance (SPM)
  - System programming reports
  - SMDR report headers

  MLX-10D, MLX-20L, and MLX-28D display telephones and MLX-10 nondisplay telephones are available in three separate versions, with factory-set buttons in English, Spanish, or French. (The MLX-10DP is available in the English version only.) In addition, user and operator guides and telephone tray cards are available in all three languages.

- **Programming and Maintenance**

  Programming and maintenance enhancements include the following:

  - Additional Inspect capability in system programming.
  - Editing capability (Backspace selection) in extension programming.
  - Improvements to system reports.
  - An access log that records the last 20 times maintenance or system programming has been accessed.
  - Longer (20-second) gap between ring cycles for programming mode and Forced Idle tone.

- **Operational**

  System operational enhancements include the following:

  - Automatic selection of an SA button when Conference is invoked
    (Hybrid/PBX mode).
  - Prompting through Conference feature on MLX display telephones.
  - Relocation of the More prompt on the MLX-20L display.
  - Display of the number saved on a programmed Last Number Dial or Saved Number Dial button when the button is inspected.

- **SPM**

  SPM enhancements include operation in English, French, or Spanish, faster backup and restore, and automatic onscreen display of reports as they are created, with a Browse capability for reading the reports.

- **Equipment**

  Additional equipment includes the 8102 and 8110 analog telephones, four headsets, two headset amplifiers, and a transparent protective cover for the MLX-10 and MLX-10D telephones. The 8102 and 8110 telephones are also compatible with Release 1.0.

- **PF Registration**

  PF registration number AS5USA-65646-PF-E is assigned by the FCC for operating the MERLIN LEGEND Communications System in Hybrid/PBX mode in the United States. (The PF registration is also applicable to Release 1.0 systems.)

Design Benefits

Modular components allow easy, cost-effective growth in both size and function. For upgrades from the MERLIN LEGEND Communications System, all wiring and analog MERLIN System telephones can be reused. For upgrades from the MERLIN II Communications System, certain trunk and extension modules can also be reused. The modules are 800, 400 (LS), 400EM, 012 T/R, 008, and 408.

Menu-driven system programming maintains the customer's command of business operations.

Built-in 1200/2400-bps modem allows fast access to the system by customers, Lucent Technologies personnel, or authorized dealers from a remote location for system programming and maintenance.

Flexible mode of operation saves upgrade costs by allowing system configuration in one of three modes: Hybrid/PBX, Key, and Behind Switch. (The factory setting on the 3.0 processor board is Hybrid/PBX.)

Connectivity to other systems in the Behind Switch mode optimizes existing resources by allowing the system to work as part of another MERLIN LEGEND Communications System, System 25, System 75, System 85, DEFINITY 75/85, or other communications system. The control unit can connect to another system's control unit via either an off-premises telephone (OPT) line or an analog or digital tie trunk.

Digital 2.048-MHz bus supplies a 64-kbps channel on each of the 216 time slots.

68EC020 Motorola CPU running at 16 MHz with zero wait states provides fast system performance.

Memory data retention saves time by ensuring that system and extension programming information is retained for five (5) days, depending on the system configuration, in case of power failure or system shutdown.

Integrated voice and data capabilities allow users to talk while transmitting data at speeds up to 64 kbps.

DS1 interface can be configured for connection of either T1 or PRI for basic call control with the 4ESS or 5ESS PRI service specifications.

Basic Rate interface (BRI) S/T protocol supports premier digital multiline (MLX) telephones with superior display capabilities and supports the ISDN terminal adapter Data Module for the connection of adjuncts.

Environmental Specifications

The control unit requires a regulated environment and can be located in any room or closet that is temperature-controlled and clean. Do not mount the control unit where it will be exposed to direct sunlight.

In addition, the control unit should not be co-located with air conditioning or ventilation units, compressors, fans and blowers, heaters, arc welders, or other machinery that produces electrical interference.

The control unit is mounted on a Lucent Technologies pre-drilled backboard.

Once installed, it is important to keep the control unit site clear of hazards, such as stacked paper or boxes, that block ventilation. Installing any machinery in the vicinity of the control unit should be avoided. If any pollution-producing work (such as sanding or spray painting) is to be done in the area, care should be taken to protect the unit.

The following table gives the environmental specifications for the control unit.

Control Unit

Fully loaded basic carrier	
Weight:	45 lb. (20.4 kg)
Dimensions:	14 inches wide x 23 inches high x 12 inches deep (35.6 cm x 58.4 cm x 30.5 cm)
Fully loaded 2-carrier system (basic carrier plus 1 expansion carrier)	
Weight:	90 lb. (40.8 kg)
Dimensions:	25 inches wide x 23 inches high x 12 inches deep (63.5 cm x 58.4 cm x 30.5 cm)
Fully loaded 3-carrier system (basic carrier plus 2 expansion carriers)	
Weight:	135 lb. (61.2 kg)
Dimensions:	37 inches wide x 23 inches high x 12 inches deep (94 cm x 58.4 cm x 30.5 cm)

Mean Time between Failures

(mean/average time the system is expected to operate before any type of failure occurs) = 2.4 years for a system configured with 24 trunks and 50 stations (extensions).

Backboard Mounting Hardware Requirements

This refers to the types of wall construction to which the backboard will be attached.

Type of material	Mounting Hardware
Wood surface	Wood screws
Concrete surface, brick, cinder block	Masonry anchors
Plaster, plasterboard	Toggle bolts
Sheet-metal surface	Sheet-metal screws

Hardware has a combined pullout force of 650 lb. (294.8 kg). When mounting to sheet-metal walls, attach to structural members.

Location

Within 5 feet (1.5 m) of dedicated AC power outlet (1 plug per carrier).

Within 1000 cable feet (304.8 m) of telephones.

Heat Dissipation

Fully loaded basic carrier 500 Btu/hr (35 cal/sec)

Fully loaded 2-carrier system 1000 Btu/hr (70 cal/sec)
(basic carrier with one expansion carrier)

Fully loaded 3-carrier system 1500 Btu/hr (105 cal/sec)
(basic carrier plus two expansion carriers)

Power Requirements

Basic carrier 117 VAC	60 Hz -15% to 10%	5.4A
2-carrier 117 VAC	60 Hz -15% to 10%	10.8A
3-carrier 117 VAC	60 Hz -15% to 10%	16.2A

Temperature/Humidity Range

40°–104°F (4°–40°C)

20%-80% relative humidity

Ventilation Clearances

1 inch (2.5 cm) on right and left sides

Radio Frequency Interference, Tolerance

1.0 V/m

Electromagnetic Interference (EMI)

To reduce electromagnetic interference emissions (possible interference problems with handheld telephones), check the date of manufacture of the CPU (517A27) units. If they were manufactured before April, 1993, replace them with a later version.

⚠CAUTION:

- For the control unit, do not use an AC outlet that is controlled by a wall switch or some other switch.
- Use an approved ground (AC receptacle for 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).

- Do not place anything on top of carriers.
- Do not install the control unit under any device that may drip fluid, such as an air conditioner.
- Do not expose the control unit to moisture, corrosive gases, dust, chemicals, spray paint, or similar materials.

Power and Grounding

Proper power and grounding are essential for correct and safe functioning of the system.

Power Specifications

The system control unit plugs into a 117-VAC outlet. To avoid accidental disconnection of the system, this outlet should not be controlled by a wall switch.

Each carrier unit requires its own power supply. Each power supply requires a maximum current of 5.4 amps. Therefore, if expansion carrier units are added to the system, extra AC outlets may be needed.

Grounding Requirements

Proper grounding of the installation site protects the system against the following:

- Lightning
- Power surges
- Power crosses on outside lines/trunks
- Electrostatic discharge (ESD)

The local telephone company is responsible for providing protection of outside lines/trunks at the entrance to the site. The protection should consist of the following:

- Carbon blocks or gas discharge tubes connected to an approved ground
- Adequate bonding of the outside line/trunk protector ground and the power company ground

⚠ WARNING:

An improper ground can result in equipment failures and service outages. Verify that the AC power uses an approved ground for its primary ground, that all voltage-limiting devices are grounded to an approved ground, and that the ground is one of the approved grounds listed below.

The following is a list of approved grounds, starting with the most preferred:

- Building steel.
- Acceptable water pipe, must be a metal, underground water pipe at least 1/2-inch (30.4 cm) in diameter, and in direct contact with the earth for at least 10 feet (3 m).
- It must be electrically continuous so that the protector ground is connected. (Check for insulated joints, plastic pipe, and plastic water meters that might interrupt electrical continuity.)

- A metallic underground water pipe must be supplemented by the metal frame of the building, a concrete-encased ground, or a ground ring.
- Other local metal underground systems or local underground structures such as tanks and piping systems.
- Rod and pipe electrodes, a 5/8-inch (1.6-cm) solid rod or 3/4-inch (1.9-cm) conduit or pipe electrode driven to a minimum depth of 8 feet (244 cm).
- Plate electrode, a minimum of 2 square feet (61 square cm) of metallic surface exposed to the exterior soil.
- Concrete-encased ground, which must be an electrode, consisting of one of the following:
  - At least 20 feet (6.1 m) of one or more steel reinforcing rods, each being at least 1/2-inch (1.27 cm) in diameter.
  - 20 feet (6.1 m) of bare copper conductor not smaller than #4 AWG, encased in 2 inches (5 cm) of concrete. This electrode must be located within and near the bottom of a concrete foundation or roofing that is in direct contact with the earth.
  - Ground ring, consisting of at least 20 feet (6.1 m) of bare copper conductor not smaller than #2 AWG, encircling the building. The ground ring must be in direct contact with the earth and buried at least 2.5 feet (77 cm) below the earth's surface.

⚠WARNING:

Do not use a metal underground gas piping system. This is a safety risk.

For most power surges, the following standard grounding requirements provide adequate lightning and 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 supplies

Additional Power Surge Protection

The 391C1, 391A3, 391A2, and 391A1 power supplies have built-in AC line protection. This built-in protection handles almost all situations.

Occasionally, additional protection may be needed if the customer is located in a heavy lightning area. The following products are available:

- The 147A protector provides AC surge protection for In-Range Out-of-Building (IROB) extensions. This protector can also provide surge protection for the 391A power supply module in heavy lightning areas.

- The 145D protector provides AC surge protection for the entire system, including the power supply module. One unit provides protection for six outlets.
- The 146C protector provides Central Office (CO) line surge protection. One unit covers four CO lines.

Complete installation instructions are provided with the surge protectors.

Control Unit Interfaces

Interface	Applications	Signaling Channel Rate	Audio/ Data Rate
BRI S/T[1]	Control unit to MLX telephone	16 kbps (D) 64 kbps (B)	
	ISDN Terminal Adapter	64 kbps (B) and (D)	
DS1	Control unit to the following services: **T1** Emulated tie trunk Emulated DID Emulated loop-start Emulated ground-start **PRI services** ACCUNET® switched digital service MEGACOM® WATS MEGACOM 800 Software Defined Network (SDN) MultiQuest® 900 number services Connectivity to 5ESS Generic 6/7/8/FTS 2000 Multiple incoming calls to directory number Call-by-Call Service Selection Password handling for FTS 2000 SID-ANI as Calling Party Number	64 kbps	
RS-232-C	Control unit to PC connected to system programming port	2400 bps or 1200 bps	2400 bps or 1200 bps
	Control unit to Lucent Technologies model 572 printer, PC with CAS, or CAT connected to RS-232-C port	1200 bps	1200 bps
ATL	Control unit to analog multiline telephone	40kHz	300–3400 Hz
Tip/Ring	Control unit to single-line telephone, modem, fax, OPT, or voice mail system	40kHz	300–3400 Hz
ETR	Control unit to ETR telephone or MLS telephone	40kHz	300–3400 Hz

1 Call handling derived from CCITT recommendation Q.931.

Network Interface Requirements

Line/Trunk Type	Facility Interface Code	Network Interface
Loop-start	02LS2	RJ11C, RJ14C, RJ21X
Ground-start	02G S2	RJ11C, RJ14C, RJ21X
DID	02RV2-T	RJ11C, RJ14C, RJ21X
OPT	OL13C	RJ11C, RJ14C
Tie	TL31M	RJ2GX
T1	04DU9-B 04DU9-C	RJ48C/X
PRI	04DU9-BN (D4 with AMI)	RJ48C/X
	04DU9-DN (D4 with B8ZS)	
	04DU9-IKN (ESF with AMI)	
	04DU9-ISN (ESF and B8ZS)	
BRI	021S5	RJ49

FCC Registration

Registration Number	REN	Type
AS593M-72682-MF-E	1.5A	Multi-function
AS593M-72914-KF-E	1.5A	Key only
AS5USA-65646-PF-E	1.5A	Hybrid/PBX

DOC Registration

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

Hardware and Software Capacities

You can configure the system as a stand-alone unit or as part of a private network. Maximum system capacities are as follows:

- Up to 108 simultaneous two-party conversations

  NOTE:
  If more than 108 conversations are in progress at the same time, blocking can occur.
- Up to 80 line/trunk jacks, including loop-start, ground-start, DID, tie, and DSI
- Up to 400 extension endpoints that support a combination of the following:
  - Up to 272 physical extension jacks for telephones and adjuncts
  - Up to 200 logical digital data ports (through ISDN terminal adapters connected to jacks on the MLX module) providing RS-232 connections to data terminals and personal computers
- System call-handling capability of 3828 hundred call seconds per hour (ccs/hr)
- Up to three 100D DS1 modules, maximum two per carrier; the 24 channels on each 100D DSI module count toward the 80 line/trunk capacity
- Up to five 800 NI-BRI modules, maximum two per carrier (Release 4.0 and later)
- One CTI link when operating in Hybrid/PBX mode

The system has a total capacity of 352 physical jacks (80 outside lines/trunks plus 272 extensions); however, each MLX module extension jack supports two logical endpoints (extension devices that can operate simultaneously and independently of each other). For example, an MLX telephone with a Multi-Function Module (MFM) plugs into one extension jack, but the jack supports both the telephone and the equipment (for example, a fax or an analog modem) connected to the MFM.

Similarly, although the 100D module has only one jack, it can serve up to 24 endpoints (emulated lines/trunks or PRI lines/trunks). Thus, you can configure the system to connect up to 80 lines/trunks and 400 extension endpoints—a total of 480 endpoints.

The next table, Hardware and Software Capacities, lists the hardware and software capacities of the system. Constraining Factors appear with a checkmark (✓) and are explained at the end of the table.

Hardware and Software Capacities

	Limit	Constraining Factor
100D Module (maximum 2 per carrier)	3	
800 NI-BRI Module (maximum 3 per carrier)	5	
Account Codes		
Characters per code	16	
Allowed/Disallowed Lists		
Number of lists	8	
Entries per list	10	
Digits per entry	7	
Authorization Codes	400	
Digits per code	11	
Automatic Route Selection (ARS)		
Number of ARS tables	16	
Subpatterns per table	2	
Routes per subpattern	6	
Entries per table	100	
Entries across all tables	1600	
Default tables	4	
Callback Calls in Queue	64	
Calling Groups		
Number of groups	32	
Members per group		
Local extensions only	20	✓
Non-local extensions only	1	✓
Total agents and supervisors	200	
Total supervisors	8	
Groups per member	1	
Primary delay announcements per system	200	✓
Secondary delay announcements per system	32	✓
Primary delay announcements per group	10	
Secondary delay announcements per group	1	
Groups per delay announcement	32	
External alerts per group	1	
Coverage groups per group	1	
Priority Queuing		
Support Group	31	home
Home Group	1	support
Carriers	3	
Line/trunk and extension module slots per basic carrier	5	✓
Line/trunk and extension module slots per expansion carrier	6	
Maximum slots available for line/trunk and extension modules	17	
Coverage Groups		
Number of groups	30	
Senders per group	400	✓
Groups per sender	1	
Receiver buttons per group	8	
Groups per QCC receiver	30	

Hardware and Software Capacities (Continued)

	Limit	Constraining Factor
CTI Link	1	✓
Data Hunt Groups		
Number of groups	32	
Members per group	20	
Groups per member	1	
Direct Inward Dialing		
Number of blocks	2	
Number of trunks	80	
Directories		
System Directory	1	
Listings	130	
Extension Directory	1	
Listings	200	
Personal Directory (MLX-20L only)	48	
Listings	50	
Endpoints (devices)	400	
Extensions		
Total physical jacks	200	
Total endpoints	400	
Fax Machines with Message Waiting	16	✓
Lines/Trunks	80	
Message Waiting Lamp Messages	1499	
Night Service		
Groups	8	
Members per group	400	
Calling groups per group	1	
Groups per member	8	
Emergency Allowed List entries	10	
Park codes (number of codes)	8	
Personal Lines	64	
Pool Buttons	64	
Ports (not simultaneously)		
Voice Announce to Busy extensions	200	
Voice Messaging interface (VMI)	24	✓
ISDN Terminal Adapter	200	
Paging	3	
Primary delay announcements	200	✓
Secondary delay announcements	32	✓
Remote Access		
Number of barrier codes	16	
Digits per code, systemwide	4–11	
Service Observing Groups		
Number of groups	16	
Observers per group	1	✓
Members per group	200	✓
Shared System Access Buttons		
Number of buttons per principal extension	27	

Hardware and Software Capacities (Continued)

	Limit	Constraining Factor
Speed Dial		
Personal Speed Dial		✓
Entries per telephone	24	
Entries per system	1200	
Digits per entry	28	
System Speed Dial		
Entries per system	130	
Digits per entry	40	
System Operating Consoles		
Direct-line consoles (DLCs)		✓
MLX-20L or MLX-28D	8	
BIS-22D, BIS-34D, or MERLIN II System Display Consoles	8	
QCCs	4	✓
Combination of DLCs plus QCCs	8	
DSSs	16	
Number of consoles per module		
408 GS/LS-MLX, 408GS/LS-ID-MLX, or 008 MLX	2	
016 MLX	4	
408 (LS-ATL) or 008 (ATL)	2	
System Programming Equipment		✓
MLX-20L	1	
RS-232 jack for PC with SPM or WinSPM	1	
Modem (built-in processor module)	1	
Telephones (not simultaneously)		
Analog multiline		
Without Voice Announce to Busy	136	
With Voice Announce to Busy	68	
MLX-20L	48	✓
All other MLX telephones (with/without ISDN terminal adapter/MFM)	200	✓
Single-line	200	✓
ETR/MLS	200	✓
Power failure transfer	20	✓
Two-Party Conversations	108	✓
Voice Messaging Systems	24	

Constraining Factors

This section describes the constraining factors that limit the capabilities supplied in the previous table.

Calling Groups

Members of groups. QCCs cannot be members of calling groups because the QCC position is set up as a system operator and has its own queue, which is different from the group's queue.

Members per group. The maximum number of local extensions in a calling group is 20. The maximum number of non-local extensions in a calling group is 1. A calling group cannot contain both local and non-local extensions.

Primary and secondary delay announcements per system. With Release 5.0 and later systems, up to 10 primary and one secondary announcement device can be designated for each calling group. Each announcement device decreases the 200 tip/ring station capacity.

Carriers

The first slot of the basic carrier is used for the processor module, with a maximum of 5 port/board slots.

Coverage Groups

Senders per group. QCCs cannot be senders because they do not have coverage available and use Position-Busy instead.

CTI Link

One CTI link is supported in Hybrid/PBX mode only.

Fax Machines with Message Waiting

The system can support more than 16 fax machines, but those in excess of 16 cannot use fax message waiting indication.

Ports (not simultaneously)

Voice Messaging Interface. Although the system software supports up to 24 VMI ports, all VMI ports must be in the same calling group, and the maximum number of extensions in a calling group is 20.

Service Observing Groups

A Service Observer station must be an MLX telephone (except QCC or CTI link). A Service Observing group member station can be any telephone except QCC or CTI link. The maximum number of members per Service Observing group is equal to the maximum number of extensions in the system.

NOTE:
Service Observing may be subject to federal, state, or local laws, rules, or regulations or require the consent of one or both of the call parties. You must check in your jurisdiction and comply with all applicable laws, rules, and regulations before using this feature. Failure to comply may result in severe penalties.

Speed Dial

Personal Speed Dial. Single-line and 5- or 10-button telephones.

System Operator Consoles

DLCs. Two consoles are allowed for each 408 MLX, 008 MLX, or analog multiline module, and four consoles are allowed for each 016 MLX module (Release 7.0 and later). A maximum of eight DLC consoles are allowed per system. Up to two DSSs can be attached to an MLX operator console, and one is built into the MERLIN II System Display Console.

QCCs. Two consoles are allowed for each 408 MLX or 008 MLX module, and four consoles are allowed for each 016 MLX module (Release 7.0 and later). A maximum of four QCC consoles are allowed per system.

System Programming Equipment

Remote access overrides onsite programming except during backup or restore.

Telephones (not simultaneously)

MLX-20L. RAM limit and the total includes the MLX-20L telephone used for system programming.

All other MLX telephones. RAM limit. An MFM and an ISDN terminal adapter cannot be connected to the same telephone (including the MLX-20L) at the same time.

Single-line. Software dial plan limit.

Power failure transfer. 1 for each 4 LS or GS line/trunk jacks.

ETR/MLS. RAM limit.

Two-Party Conversations

216 time slots.

Ordering Codes

Component	PEC/SAP	Comcode	App. Code
MODELS			
MERLIN LEGEND R7			
Control Unit	**6140-CU7**		
R7.0 Processor (CKE4)		108424136	517P33A
Power Supply Module		107793275	391C1
Backplane/Basic Housing and Carrier		108059304	403J Wall
CU Cover		106905953	18A
Empty Filler Module		107005720	
Backup Card		107779878	10A2
WinSPM CD ROM – Customer		408059376	555-670-804
Customer Ref. CD-ROM[1]		108370347	555-670-800
System Manager Quick Reference (paper)		108370321	555-670-119
Note: As of 1/18/99, bundles are no longer offered.			
UPGRADES			
MERLIN LEGEND Hardware Upgrade—(ships new CPU) R1/R2/R3 (installs prior to April 1998) /R4/R5/R6.0 to R7	**6141-U7LA**		
R7.0 Processor (CKE4)		108424136	517P33A
Backup Card		107779878	10A2
WinSPM CD ROM – Customer		408059376	555-670-804
Customer Ref. CD-ROM[1]		108370347	555-670-800
System Manager Quick Reference (paper)		108370321	555-670-119
MERLIN LEGEND Software Upgrade—R3.1 (since April 1998) /R6.1 to R7[2]	**6141-119A**		
Forced Install Card		108387929	10J1
WinSPM CD ROM – Customer		408059376	555-670-804
Customer Ref. CD-ROM[1]		108370347	555-670-800
System Manager Quick Reference (paper)		108370321	555-670-119
Note: To Upgrade from MERLIN II to R7, use MERLIN LEGEND Control Unit ordering codes (6140-CU7).			
MERLIN LEGEND Upgrade—Free Hardware Upgrade from R5/R6 to R7[3]	**6141-U7LP**		
R7.0 Processor (CKE4)		108424136	517P33A
Backup Card		107779878	10A2
WinSPM CD ROM - Customer		408059376	555-670-804
Customer Ref. CD-ROM[1]		108370347	555-670-800
System Manager Quick Reference (paper)		108370321	555-670-119
MERLIN LEGEND Upgrade—Free Software Upgrade from R6.1 to R7[3]	**6141-119P**		
Forced Install Card		108387929	10J1
WinSPM CD ROM – Customer		408059376	555-670-804
Customer Ref. CD-ROM[1]		108370347	555-670-800
System Manager Quick Reference (paper)		108370321	555-670-119
ADDITIONAL CONTROL UNIT COMPONENTS			
Power Supply	**61477/A**	**107779878**	**391C1**
2 MB Blank PCMCIA Backup/Restore Card	**61475/A**	**107779878**	**10A2**
4 MB Blank PCMCIA Backup/Restore Card	**61501**	**107245243**	**10A1**
Customer Ref. Paper Manuals	**61612/A[2]**	**108370255**	**555-670-100**
SPM Version 7.15 – DOS	**61530/A**	**108411273**	
SPM Version 7.15 – UNIX for IS	**61550A**	**108411281**	
WinSPM CD ROM – External Use	**6140-SPM**	**408059376**	**555-670-802**

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
WinSPM Floppy – External Use	**6141-SPM**	**408059384**	**555-670-803**
WinSPM CD ROM – Internal Services Use		**408059392**	**555-670-804**
WinSPM Floppy – Internal Services Use		**408059400**	**555-670-805**
Expansion Unit	**61490/A 102799**		
Expansion Wall Mount with Top/Front Cover		107007122	403H
Power Supply		107793275	391C1
Top/Front Cover (Choose One) Cov99[5] (No Covers) Cov01 (One Top/One Front) Cov02 (Two Top/Two Front)		106905953	18A
Empty Module (Choose One) MOD90[4] (No Module) MOD01 (One Module)		107005720	19A
Kit of Parts (Cover Labels and Ferrite Cores; not in PEC 61490)		107005027	D182764
Plastic Backboard Hardware			
Template		847009206	
Backboard (31.5'' x 27'')		847007523	
Shipping Container		847087376	
Shipping Tray		847087392	
Shipping Insert (pair)		847087384	
Network X-Conn: RJ-21X		403613003	
Station X-Conn: BR2580-66 Block		405464777	
Line/Trunk and Extension Modules			
008 (ATL)	61485/A	105351092	517B3
008 MLX	61486/A	108333717	517c21
008 OPT + Ring Generator	61479/A	107731994	517E28
012 (T/R) + Ring Generator	61494/A	107989584	517J13
016 (T/R) with 4 TTRs	61507/A	108333691	517D34
016 ETR with 4 TTRs	61551/A	108359571	517A54
016 MLX	61511/A	108333659	517A54
100D(DS1)	61491/A	108044769	517M15
800 DID	61488/A	108318478	517G20
800 NI-BRI	61510/A	108318494	517B35
400EM (tie trunk)	61492/A	108314261	517D14
400 GS/LS/TTR	61483/A	107091399	517C18
408 GS/LS (ATL)	61481/A	107091407	517D26
408 GS/LS-ID-MLX	61505/A	108333733	517E29
800 DID with 2 TTRs	61488/A	108318478	517G20
800 GS/LS-ID ICL with 4 TTRs	61502/A	108357609	517B31
Vintage Line/Trunk and Extension Modules			
408 LS/ATL	61482	105512495	517C1
INACTIVE Models/Bundles and Modules			
MERLIN LEGEND R3 Control Unit (Inactive)	**6140-C31 105846**		
Power Supply		107793275	391C1
CKE4 Processor		108182643	517D33A
Translation Card		107245243	10A1
Backplane		107007114	403G
Customer Ref. Manuals		108251877	
MERLIN LEGEND MLX/ATL Bundle (Inactive)	**6140-61D 106711**		
R6.1 Processor (CKE4)		108282765	517M33A
Power Supply		107793275	391C1
Backup Card		107779878	10A2
SPM–DOS 6.25		108389628	TBD
Backplane		108059304	403J Wall
CU Cover (Attribute: COV01)		106905953	18A
Empty Module (Attr: MDL01)		107005720	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
408 GS/LS-MLX Mod (QTY: 2)		108236902	517D29
008 ATL Module		105351092	517B3
Customer Ref. CD-ROM[1] (Attribute: DOC52)		108289034	555-661-800
Customer Ref. Paper Manuals[2] (Attribute: DOC51)		108303264	555-661-100
Network Ref. Paper Manual (Attribute: NRD01)		108289703	555-661-150
MERLIN LEGEND 016/ATL/MLX Bundle (Inactive)	**6140-61F 106712**		
R6.1 Processor (CKE4)		108282765	517M33A
Power Supply		107793275	391C1
Backup Card		107779878	10A2
SPM–DOS 6.25		108389628	TBD
Backplane		108059304	403J Wall
CU Cover (Attribute: COV01)		106905953	18A
Empty Module (Attr: MDL01)		107005720	
408 GS/LS-MLX Module		108236902	517D29
408 GS/LS/ATL Module		107091407	517D26
016 T/R Module		107856551	517C34
Customer Ref. CD-ROM[1] (Attribute: DOC52)		108289034	555-661-800
Customer Ref. Paper Manuals[2] (Attribute: DOC51)		108303264	555-661-100
Network Ref. Paper Manual (Attribute: NRD01)		108289703	555-661-150
MERLIN LEGEND 016/MLX Bundle (Inactive)	**6140-61G 106713**		
R6.1 Processor (CKE4)		108282765	517M33A
Power Supply		107793275	391C1
Backup Card		107779878	10A2
SPM–DOS 6.25		108389628	TBD
Backplane		108059304	403J Wall
CU Cover (Attribute: COV01)		106905953	18A
Empty Module (Attr: MDL01)		107005720	
408 GS/LS-ID-MLX Mod (QTY: 2)		108236902	517D29
016 T/R Module		107856551	517C34
Customer Ref. CD-ROM[1] (Attribute: DOC52)		108289034	555-661-800
Customer Ref. Paper Manuals[2] (Attribute: DOC51)		108303264	555-661-100
Network Ref. Paper Manual (Attribute: NRD01)		108289703	555-661-150
MERLIN LEGEND 3150 DS1 CSU Bundle (Inactive)	**6140-61I 106714**		
R6.1 Processor (CKE4)		108282765	517M33A
Power Supply		107793275	391C1
Backup Card		107779878	10A2
SPM–DOS 6.25		108389628	TBD
Backplane		108059304	403J Wall
CU Cover (Attribute: COV01)		106905953	18A
Empty Module (Attr: MDL01)		107005720	
T1 ESF CSU		107564510	
DS1 Module		108044769	517M15
DB15-D515 Screw Slide Latch		107369324	
CJ48M-RJ48M Cable		107369274	
Customer Ref. CD-ROM[1] (Attribute: DOC52)		108289034	555-661-800
Customer Ref. Paper Manuals[2] (Attribute: DOC51)		108303264	555-661-100

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Network Ref. Paper Manual (Attribute: NRD01)		108289703	555-661-150
MERLIN LEGEND DS1 DSU/ CSU Bundle (Inactive)	**6140-61J 106715**		
R6.1 Processor (CKE4)		108282765	517M33A
Power Supply		107793275	391C1
Backup Card		107779878	10A2
SPM–DOS 6.25		108389628	TBD
Backplane		108059304	403J Wall
CU Cover (Attribute: COV01)		106905953	18A
Empty Module (Attr: MDL01)		107005720	
T1 DSU/CSU		107563983	
DS1 Module		108044769	517M15
DB15-D515 Screw Slide Latch		107369324	
CJ48M-RJ48M Cable		107369274	
CA Assembly DR		107369340	
MTG-DR Bracket		107369803	
Customer Ref. CD-ROM[1] (Attribute: DOC52)		108289034	555-661-800
Customer Ref. Paper Manuals[2] (Attribute: DOC51)		108303264	555-661-100
Network Ref. Paper Manual (Attribute: NRD01)		108289703	555-661-150
MERLIN LEGEND 012 to 016 T/R Trade-in Package (Inactive)	**6141-T40A**		
016 T/R Module		107856551	517C34
Customer Ref. Paper Manuals[2]		108303264	555-661-100
MERLIN LEGEND MLX/012 T/R Bundle (Inactive)	**6140-31C 105845**		
Power Supply		107793275	391C1
Backplane		107007114	403G
Translation Card		107245243	10A1
CKE4 Processor		108182643	517D33A
408 GS/LS-MLX Mod. (QTY: 2)		108236902	517D29
012 T/R Module w/Ring Gen.		107989584	517J13 (28)
Customer Ref. Manuals		108251877	
MERLIN LEGEND MLX/ATL Bundle (Inactive)	**6140-31D 105844**		
Power Supply		107793275	391C1
Backplane		107007114	403G
Translation Card		107245243	10A1
CKE4 Processor		108182643	517D33A
408 GS/LS-MLX Mod (QTY: 2)		108236902	517D29
008 ATL Module		105351092	517B3
Customer Ref. Manuals		108251877	
MERLIN LEGEND MLX/ATL/012 Package (Inactive)	**6140-31E 105843**		
CKE4 Processor		108182643	517D33A
Backplane		107007114	403G
Power Supply		107793275	391C1
Translation Card		107245243	10A1
408 GS/LS-MLX Module		108236902	517E29
012 T/R Module w/Ring Gen.		107989584	517J13
408 GS/LS/ATL Module		107044877	517C26
Customer Ref. Manuals		108251877	
MERLIN LEGEND Upgrade— R1/R2 to R3 (Inactive)			
R3.1 Processor		107752693	517D33
Translation Card		107245243	10A1

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
SPM—UNIX		107741266	
SPM—DOS		107741258	
R3.0 Customer Ref. Manuals		107713679	
MERLIN LEGEND Upgrade—M II to R3 (Inactive)			
R3.1 Processor		107752693	517D33
Blank Translation Card		107245243	10A1
Kit of Parts (Cover Labels and Ferrite Cores)		107005027	D182764
R3.0 Customer Ref. Manuals		107713679	
MERLIN LEGEND R3 to R3.1 Upgrade (Inactive)			
Forced Installation Card		107752677	10B2
Doc Release Notes		107747479	
Telephones			
MLX Telephones			
MLX-5®			
English (black)	3156-0BB	107894719	7712D05D-003
English (white)	3156-0BW	107894727	7712D05D-264
MLX-5D®			
English (black)	3156-0DB	107894735	7712D06D-003
English (white)	3156-0DW	107894743	7712D06D-264
MLX-10			
English (black)	3156-02B	107108722	7712D01D-003
English (white)	3156-02W	107108748	7712D01D-264
French (black)	3156-F2I	107108797	7712D01D(29)-003
French (white)	3156-F2I	107108789	7712D01D(29)-264
Spanish (black)	3156-S2I	107108755	7712D01D(22)-003
Spanish (white)	3156-S2I	107108771	7712D01D(22)-264
MLX-10D			
English (black)	3156-03B	107108870	7712D02D-003
English (white)	3156-03W	107108888	7712D02D-264
French (black)	3156-F3I	107108938	7712D02D(29)-003
French (white)	3156-F3I	107108920	7712D02D(29)-264
Spanish (black)	3156-S3I	107108904	7712D02D(22)-003
Spanish (white)	3156-S3I	107108912	7712D02D(22)-264
MLX-10DP			
English (black)	3156-06B	107108946	7712D04D-003
English (white)	3156-06W	107108953	7712D04D-264
MLX-16DP®			
English (black)	3156-07B	106922271	7715D01D-003
English (white)	3156-07W	106922289	7715D01D-264
Spanish (black)	3156-S7I	106987423	7715D01D(22)-003
Spanish (white)	3156-S7I	106987456	7715D01D(22)-264
French (black)	3156-F7I	106987472	7715D01D(29)-003
French (white)	3156-F7I	106987498	7715D01D(29)-264
East. Europe (black)	3156-S7I	106987506	7715D01D(22)-003
East. Europe (white)	3156-S7I	106987514	7715D01D(22)-264
MLX-20L			
English (black)	3156-05B	107108979	7713D01D-003
English (white)	3156-05W	107108987	7713D01D-264
French (black)	3156-F5I	107109027	7713D01D(29)-003
French (white)	3156-F5I	107109019	7713D01D(29)-264
Spanish (black)	3156-S5I	107108995	7713D01D(22)-003
Spanish (white)	3156-S5I	107109001	7713D01D(22)-264
MLX-28D			
English (black)	3156-04B	107115800	7713D02D-003
English (white)	3156-04W	107115818	7713D02D-264
French (black)	3156-F4I	107115842	7713D02D(29)-003
French (white)	3156-F4I	107115859	7713D02D(29)-264
Spanish (black)	3156-S4I	106613599	7713D02D(22)-003
Spanish (white)	3156-S4I	106613607	7713D02D(22)-264

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
MLX Secure Telephones			
MLX-10DS			
English (black)	3156-03S	107185076	7712DO2D1-003
MLX-28DS			
English (black)	3156-04S	107185050	7713D02D1-003
MLX-20LS			
English (black)	3156-05S	107185068	7713D01D1-003
Fiber Interface Card		406981217	93030.2 FIB INT
with Ring Generator	61393		PRN
Chassis with Power			
Supply, Blank Cover	6139-SFS	406981225	93030.8C MINI
800 LS Card	61394	406981241	903030.3 2 WIRE PRN
Inactive MLX Telephones			
MLX-5			
French (black)		107926834	7712D05D(29)-003
French (white)		107926842	7712D05D(29)-264
Spanish (black)		107926859	7712D05D(22)-003
Spanish (white)		107926867	7712D05D(22)-264
Hungarian (black)		107926875	7712D05D(30)-003
Hungarian (white)		107926883	7712D05D(30)-264
MLX-5D			
French (black)		107926891	7712D06D(29)-003
French (white)		107926909	7712D06D(29)-264
Spanish (black)		107926917	7712D06D(22)-003
Spanish (white)		107926925	7712D06D(22)-264
Hungarian (black)		107926933	7712D06D(30)-003
Hungarian (white)		107926941	7712D06D(30)-264
ETR (PARTNER)			
ETR-6 (black)	3158-04B/A	107854788	7311H12A-003
ETR-6 (white)	3158-04W/A	107854796	7311H12A-264
ETR-6 (gray)	3158-04G/A	107854804	7311H12A-323
ETR-18 (black)	3158-05B/A	107854812	7311H13A-003
ETR-18 (white)	3158-05W/A	107854820	7311H13A-264
ETR-18 (gray)	3158-05G/A	107854838	7311H13A-323
ETR-18D (black)	3158-07B/A	107854846	7311H14A-003
ETR-18D (white)	3158-07W/A	107854853	7311H14A-264
ETR-18D (gray)	3158-07G/A	107854861	7311H14A-323
ETR-34D (black)	3158-08B/A	107854054	7515H04A-003
ETR-34D (white)	3158-08W/A	107854062	7515H04A-264
ETR-34D (gray)	3158-08G/A	107320749	7515H04A-323
MLS (Inactive)			
MLS-6 (black)	3151-04B/A	107092165	
MLS-6 (white)	3151-04W/A	107092181	
MLS-12 (black)	3151-05B/A	107092116	
MLS-12 (white)	3151-05W/A	107092124	
MLS-12D (black)	3151-06B/A	107092157	
MLS-12D (white)	3151-06W/A	107092132	
MLS-18D (black)	3151-07B/A	107092215	
MLS-18D (white)	3151-07W/A	107092207	
MLS-34D (black)	3151-08B/A	106927551	
MLS-34D (white)	3151-08W/A	106927569	
Analog Multiline Telephones (black)			
BIS-10	3165-10B/A	107137671	7313HO1C-003
BIS-22	3166-22B/A	107137689	7314HO1C-003
BIS-22D	3166-DSB/A	107623449	7315HO1F-003
BIS-34D	3167-DSB/A	107635476	7317HO1F-003
Inactive Analog Multiline Telephones (black)			
MLC-5		105515332	7312HO1C-003
5-Button		105217426	Z7302H01D-003
10-Button		106641079	Z7303H01D-003
10-Button HFAI		106641053	Z7309H01C-003
34-Button Deluxe		106641046	Z7305H02D-003
34-Button BIS		106641087	Z7305H03D-003
34-Button		106641061	Z7305H01B-003

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
34-Button BIS/DIS		106641095	Z7305H04C-003
MERLIN PFC™ (ATL)		106681562	SET COMM 50A
PFC paper		406956367	
Single-Line Telephones			
2500 YMGL	3101-KFD/A		
Black		107005043	2500YMGL-003
Misty cream		107005050	2500YMGL-215
2500 YMGM			
Black		107732422	2500YMGM-003
Misty cream		107732430	2500YMGM-215
2500 MMGL	3101-KBD/A		
Black		107023236	2500MMGL-003
Misty cream		107023277	2500MMGL-215
6210			
Deep gray	3198-10G/A		
Lucent white	3198-10W/A		
6220			
Deep gray	3198-20G/A		
Lucent white	3198-20W/A		
Inactive Single-Line Telephones			
2500 YMGK (message waiting, recall, touch-tone, desk)			
Black		105480578	2500YMGK-003
Misty cream		105480560	2500YMGK-215
2500 MMGK (recall, touch-tone, desk)			
Black		105414130	2500MMGK-003
Misty cream		105414122	2500MMGK-215
2500 MMGJ (touch-tone, desk)			
Black		105414155	2500MMGJ-003
Misty cream		105414148	2500MMGJ-215
2554 MMGJ (touch-tone, wall)			
Black		105480081	2554MMGJ-003
Misty cream		105480032	2554MMGJ-215
500 MM (rotary, desk)			
Black		103870234	500MM-03
Ivory		103870226	500MM-50
Beige		103870267	500MM-60
554 BMPA (rotary, wall)			
Black		103823498	554BMPA-3
Ivory		103823506	554BMPA-50
8110M Analog Voice	3193-001		
Black		107535841	8110A01D-003 811
Kit (4 black sets)		107538399	8110A01D-003
White		107535858	8110A01D-264 811
Kit (4 white sets)		107538401	8110A01D-264
8102M Analog Voice	3192-001		
Black		107538357	8102A01C-003 810
Kit (4 black sets)		107538373	8102A01C-003
White		107538365	8102A01C-264 810
Kit (4 white sets)		107538381	8102A01C-264
8101 Analog Voice	3192-101		
Black		107730475	8101A01-B003
White		107730483	8101A01-B264
Wireless Telephones			
BC 905 Business Cordless	3206-02B	1081660 59	
Battery	32091	407759729	
Belt Clip	3206-CLP	847903614	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
MDW 9031P TransTalk™			
Wireless Telephone Set (stand-alone product shipped w/ power pack)			
Black	3204-07B		
MDW 9031P TransTalk™			
Wireless Telephone Set (sets for use with wireless carrier assembly)			
Black	3204-W7B		
TransTalk Wireless			
Carrier Assembly	3204-CR3		117A1
Headset	3122-042		
Headpiece		407713718	
QD Cord		407714401	
Headset (packaged with an adapter)	3122-043		
Headpiece		407720739	
QD Cord		407714401	
Battery Pack			
Black	32045	107733107	
Extended Life Battery	32049	107733115	
Carrying Case (Holster)	32090	848026092	
Inactive Cordless/Wireless Telephones			
Model 5405		106440472	CS6300U30A-2292
Model 5455		106440464	CS6300U29A-2292
MDC 9000 Business			
Cordless Telephone Set			
White		107304982	7311H11B-264
Black		107304974	7311H11B-003
Battery Pack for MDW 9010			
White		106760812	
Black		106760804	
Special-Purpose Telephones			
Touch-tone Outdoor WL	8800-031	407380922	2526
Manual Dial Outdoor WL	8800-002	407380955	526
Auto-Dial Outdoor WL	8800-003	407380930	526 AMACADL
Explosive Atmosphere Telephones			
2520B			
Touch-tone, Wall[5]	3129-ETW	103873030	2520B-3
Inactive Special-Purpose Telephones			
520B			
Rotary, Desk		103873048	520B-3
Rotary Outdoor WL		105727444	526
Consoles			
DSS			
English (black)	3156-DCB	106902463	604B1-003
English (white)	3156-DCW	106902489	604B1-264
Spanish (black)	3156-SDI	107013294	604B1(22)-003
Spanish (white)	3156-SDI	107013302	604B1(22)-264
Inactive Consoles			
MERLIN II			
System Display Console		105229744	7318H01A-003

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Applications			
SPM Version 2.16–DOS	**61495**	**107259905**	
SPM Version 2.16–UNIX	**61496**	**107259913**	
SPM Version 3.18–DOS	**61495**	**107259905**	
SPM Version 3.18–UNIX	**61496**	**107259913**	
SPM Version 4.15–DOS	**61508**	**107886608**	
SPM Version 4.15–UNIX	**61509**	**107886624**	
SPM Version 5.15–DOS	**61515**	**108007774**	
SPM Version 5.15–UNIX	**61514**	**108007782**	
SPM Version 6.15–DOS	**61526**	**108096132**	
SPM Version 6.15–UNIX	**61527/A**	**108096140**	
SPM Version 6.25–DOS	**61528/A**	**108280165**	
SPM Version 6.25–UNIX	**61529/A**	**108280546**	
SPM Version 7.15–DOS	**61530/A**	**108411273**	
SPM Version 7.15–UNIX for IS	**61550/A**	**108411281**	
WinSPM CD ROM – External Use	**6140-SPM**	**408059376**	**555-670-802**
WinSPM Floppy – External Use	**6141-SPM**	**408059384**	**555-670-803**
WinSPM CD ROM – Internal Services Use		**408059392**	**555-670-804**
WinSPM Floppy – Internal Services Use		**408059400**	**555-670-805**
Call Accounting System (CAS)			
CAS for Windows			
50-station	1202-651/A		
100-station	1202-652/A		
200-station	1202-653/A		
Custom Rate Table (mandatory)	12055		
HACKERTRACKER for Windows	1202-660/A		
Supplemental Initialization Support	12057		
Parallel Printer (optional)			
dot matrix	69769		
Parallel Printer Cable	69641	846943298	
Serial Printer	4200-572		
Parallel Printer	4200-570		
Hacker/Tracker	12014	406806166	PCCB6201
Fax/Modem SW		407046317	92193WP
INTUITY CAS 50 Station	1201-052/A		
INTUITY CAS HACKERTRACKER	1201-054/A		
INTUITY CAS 50 Station Upgrade	1201-053/A		
INTUITY CAS Custom Rates	12054		
Inactive CAS			
CAS Plus V3.1.1			
Bundle, Model 300 (does not include a printer)			
Custom Rate Table			
CAS Plus V3 Bundle w/ 80-col. Parallel Printer			
CAS Plus V3 Bundle w/ 132-col. Parallel Printer			
CAS Plus V3 Software Rate Table[6]		406362244	
CAS Plus V3 Update (SW)		406158444	3300EA51
CAS Plus Upgrade		406025916	3300KA2U
CAS V3 Hacker Tracker (MS-DOS)		406774513	3399EA
IS-III UNIX CAS 250	1201-U14A	407243187	ISIII CAS 250

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
UNIX CAS Rate Tables		406140764	3.5 SW ATT MTS
IS-III UNIX CAS Upgrade 500 (250-500)	1201-U15A	406898254	UN/CAS UPGR
IS CAS Upgrade to NANP	1201-U16A		IS CAS NANP
M/L&S – 25 Upgrade NANP	1201-U17A		
IS II CAS Upgrade to IS III	1201-U18A		
UNIX HackerTracker	1201-U13A	406898270	SFTW-ISIII
Call Accounting Terminal (CAT)			
CAT BASIC/B (LEGEND)	3600-010/A		
Printer		406716464	PRNTR-ML182-R2
Processor		406669769	PROCR-36001-C1
CAT + LEGEND/H	3600-024/A		
Printer		406716464	PRNTR-ML182-R2
Processor		406478818	PROCR-37000-C6-HQU
CAT + LEGEND/B	3600-023/A		
Printer		406716464	PRNTR-ML182-R2
Processor		406478800	PROCR-37000-C6-BQU
CAT Basic Rate Table[6] (Update Chip)	36014A	406669739	
CAT/B Rate Table[6] (Update)	36023A	406478792	
CAT/H Rate Table[6] (Update)	36024A	406478784	
MERLIN LEGEND Reporter			
Single Site, 50 stations	1201-011		
Single Site, 200 stations	1201-012		
Inactive Call Management System (CMS)	1207-100		
5		107004988	
3		107004970	
MII/ML CMS Alerter	83010		
Block Connector		105164859	104A-246
Power Supply		405331711	KS22911L2 120VAC
Inactive CONVERSANT INTRO			
MAP5 Tower/AVP/ LEGEND Bundle (no Script Builder)			
MAP5 500MB Hard Drive			
8 MB RAM			
(QTY: 1) IVP 4 Board (4 ports)			
Color Monitor			
Keyboard			
9-25 pin Adapter			
Applications Printer			
321P/Printer cable			
9600 bps modem			
(Qty: 2) D8W cords			
(Qty: 2) 250 MB Tapes			
Surge protector			
CONVERSANT INTRO 3.1.1			
Basic speech (male/female)			
IVP Platform Software			
AVP 2.1.1 Software			
LEGEND/IVR Switch Integration Software			
MAP5 Tower/AVP/ LEGEND bundle (with Script Builder)			
(Qty:2) IVP 4 Boards (8 ports)			
Remaining components are the same as PEC 4201-410			

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
PassageWay Direct Connect (R2)	**8302-500**	**407214782**	
PassageWay upgrade R1 to R2	8302-520A	407189802	
PassageWay R2 and Commence 3.1	8302-522		
PassageWay Software		407214782	
Commence Software		407528512	
PassageWay R2 and Commence Startup	8302-523		
PassageWay Software		407214782	
Commence Startup Software		407160043	
PassageWay R2 and OnTime 1.54	8302-524		
PassageWay Software		407214782	
OnTime Software		407127349	
Fast Call Software	8330-191	407344928	
Fast Call and Passage Way Direct Connect	8302-521		
Commence 2.1	8330-201	407160027	
Commence Startup	8330-202	407160043	
OnTime 1.54	8330-301	407127349	
Inactive Telephony Services Netware for MERLIN LEGEND	**8320-500/A**		
PassageWay Telephony Services R2.21D for Netware (core/clients)		407556364	
PassageWay Telephony Services R2.21D for Netware (250+user license)		407465558	
PassageWay Telephony Services Netware Driver for MERLIN LEGEND		108027368	
EICON ISDN Board for MERLIN LEGEND PassageWay Telephony Services		407556364	
Inactive Lucent Technologies Attendant	**6125-ATT**		
Hardware		406899054	
Documentation		106431265	
MERLIN LEGEND Mail Voice Messaging System			
2-port	7107-302/A		
4-port	7107-304/A		
6-port	7107-306/A		
Upgrade 2-port to 4-port	7107-311A		
Upgrade 2-port to 6-port	7107-312A		
Upgrade 4-port to 6-port	7107-313A		
Messaging 2000 Voice Messaging System			
4-port voice messaging system[7]	7052-004 106217		
4 port dialog4		407909993	
Monitor – color		407900547	
6-port voice messaging system[7]	7052-006 106218		
6 port dialog4		407910009	
Monitor – color		407900547	
8-port voice messaging system[7]	7052-008 106219		
8 port dialog4		407910017	
Monitor – color		407900547	
12-port voice messaging system[7]	7052-012 106220		
12 port dialog4		407910025	
Monitor – color		407900547	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
4-port voice/2-port fax messaging system[7]	7052-204 106221		
4 port dialog4, 2 port fax		407910033	
Monitor – color		407900547	
6-port voice/2-port fax messaging system[7]	7052-206 106222		
6 port dialog4, 2 port fax		407910066	
Monitor – color		407900547	
8-port voice/2-port fax messaging system[7]	7052-208 106223		
8 port dialog4, 2 port fax		407910082	
Monitor – color		407900547	
12-port voice/2-port fax messaging system[7]	7052-212 106224		
12 port dialog4, 2 port fax		407910108	
Monitor – color		407900547	
4-port voice/4-port fax messaging system[7]	7052-404 106225		
4 port dialog4, 4 port fax		407910058	
Monitor – color		407900547	
6-port voice/4-port fax messaging system[7]	7052-406 106226		
6 port dialog4, 4 port fax		407910074	
Monitor – color		407900547	
8-port voice/4-port fax messaging system[7]	7052-408 106227		
8 port dialog4, 4 port fax		407910090	
Monitor – color		407900547	
4- to 6-port voice upgrade	7052-606U 106234		
Dialog4 board		407901412	
4 to 6 Port License/Sentinal Disk Utility		407920792	
6- to 8-port voice upgrade	7052-608U 106235		
Dialog4 board		407901412	
6 to 8 Port License/Sentinal Disk Utility		407920800	
8- to 12-port voice upgrade	7052-612U 106236		
Dialog4 board		407901412	
8 to 12 Port License/Sentinal Disk Utility		407920818	
12- to 16-port voice upgrade	7052-616U 106237		
Dialog4 board		407901412	
12 to 16 Port License/Sentinal Disk Utility		407920826	
2-port fax upgrade	7052-200U 106238		
2 port Brooktrout fax board		407914423	
Port License/Sentinal Disk Utility		407914498	
2- to 4-port voice upgrade	7052-400U 106239		
2 port Brooktrout fax board		407914423	
Port License/Sentinal Disk Utility		407923770	
Visual Mailbox Starter Kit	7052-700 407914445	407914415	
Visual Mailbox Software License			
10 Seats	7052-710U 106240	407914431	
25 Seats	7052-725U 106241	407914449	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
50 Seats	7052-750U		
	106242	407914464	
100 Seats	7052-752U		
	106243	407914472	
250 Seats	7052-755U		
	106244	407914480	
Inactive MERLIN Mail Voice Messaging			
MERLIN Mail Voice Messaging System for the MERLIN LEGEND Communications System (Release 3)			
2-port			
MERLIN Mail unit		407241926	
modem		407002427	
4-port			
MERLIN Mail unit		407536739	
modem		407002427	
6-port			
MERLIN Mail unit		407241942	
modem		407002427	
Release 3 Upgrade			
2-port to 4-port		407241934	
modem		407002427	
2-port to 6-port		407241942	
modem		407002427	
4-port to 6-port		407241942	
modem		407002427	
2-port line card (R2) (upgrade from 2 to 4 for MERLIN Mail releases prior to V7.4)		407108521	
2-port line card (upgrade from 2 to 4 for MERLIN Mail releases V7.4 or later)		407072115	
MERLIN Identifier (for MERLIN LEGEND R2.x)			
MERLIN Mail Voice Messaging System for the MERLIN LEGEND Communications System (Release 2)			
2-port			
MERLIN Mail unit		407161355	
Remote maintenance device		407002427	
MERLIN Mail Multi-Lingual Admin. Guide (585-320-742)		107074932	
User's Quick Reference (585-320-741)		107074924	
4-port			
MERLIN Mail unit		407161363	
Remote maintenance device		407002427	
MERLIN Mail Multi-Lingual Admin. Guide (585-320-742)		107074932	
User's Quick Reference (585-320-741)		107074924	
Intuity Voice System			
4-port	7055-004		
6-port	7055-006		
8-port	7055-008		
10-port	7055-010		
12-port	7055-012		
Administration	6128-KBD	406891556	
Controller Assembly with PC Administration	6128-PCA	406891564	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
DISCONTINUED			
Controller Assembly with Display Keyboard			
Display Assembly with Wall-Mounting		406891572	
Call Alert Software		406891721	
Bracket Assembly, ATL Telephone Mounting		406891937	
Fixture, Display Wallmount		406891929	
PC Administration Adapter Kit		406960930	
Printer Adapter Kit		406960948	
Printer Port to PC Adapter Kit		406960955	
Installation and System Administration Manual		406891713	
Quick Reference Card for MERLIN Identifier Users		406891705	
Display Unit		406891663	
Keyboard 101		406891655	
Controller with Mounting Panel		406891648	
Cable, Serial RS-232, Controller to PC		406891903	
MERLIN LEGEND R5.0 TSAPI Offers			
In all R5.0 PECs where paper and CD-ROM are options, add attributes: Paper (attribute: doc51) CD-ROM (attribute: doc52) default			
MERLIN LEGEND R5.0 Documentation			
End-user CD-ROM		108289034	
Internal CD-ROM (Lucent Technologies Associates only)		108007964	
MERLIN LEGEND TSAPI Solution	8320-500		
PassageWay Telephony Services R2.21D for NetWare Core/Clients)		407556364	
PassageWay Telephony Services R2.21D for NetWare - 250+User License		407465558	
Legend Driver Software		108027368	
EICON Card		407556364	
CCOM Application (PhoneLine) (does not include Professional Services)			
5 Users License			
10 Users License			
25 Users License			
50 Users License			
Q.SYS Application (PhoneWare) (does not include Professional Services)			
5 Users License			
10 Users License			
25 Users License			
50 Users License			
CALLWARE Application (Phonetastic) (does not include Professional Services)			
5 Users License			
Phonetastic Admin Guide			

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
User Guide			
Application (core)			
10 Users License			
Phonetastic Admin Guide			
User Guide			
Application (core)			
25 Users License			
Phonetastic Admin Guide			
User Guide			
Application (core)			
50 Users License			
Phonetastic Admin Guide			
User Guide			
Application (core)			
100 Users License			
Phonetastic Admin Guide			
User Guide			
Application (core)			
Professional Services Offers			
1 Application			
2 Applications			
Custom Contract			
MERLIN LEGEND Enhanced Service Center			
12-port System	61516		
2.5GB Blank Tape (QTY: 3)		407557073	
Color Monitor		406504571	
Snap-on Ferrite (QTY: 4)		407616846	
Keyboard		407681907	
UNIXWare Base Sftwr Tape 5P		ED5P91260	G-18
Map/5P Tower		J1P260F1	L-1
V6.0 Map/5P New System Install & Maint Doc		J1P260F1	L-AG
Base System Boot Sftwr		J1P260TH1	L-1
INTUITY Bkp/Res Util		J1P260TH1	L136
ENH Sft Tech Bkp/Res		J1P260TH1	L137
INTUITY UNIX Mang Scn Pkg		J1P260TH1	L138
Oracle for W95, NT, 3.1		108007758	
Data Collection Pkg		J1P260TH1	L-28
Veritas Sftwr		J1P260TH1	L3
Generic SoftTape		J1P260TH1	L4
Configuration Data Pkg		J1P260TH1	L5
Hardware Res		J1P260TH1	L7
INTUITY CONVERSANT VIS V6.0 Set-Update+		J1P260TH1	L-76
Tip/Ring Board Driver		J1P260TH1	L-88
Fea. Test Script Pkg		J1P260TH1	L9
Call Bridge Application Pkg		J1P260TH1	L-90
UNIXWare 1.1.2 Enhance Set		J1P260TH1	L-94
CA Assy-84000		407265529	
Analog Adap Kit 885A (QTY:2)		601419666	
IVC6 Card (AYC10) (QTY:2)		106406580	
25 ft Tel Cord (QTY:4)		103612195	
3 ft Tel Mtg Cord (QTY:4)		ED5P20830	G-16
BUS Cable		J1P260F1	L8
Analog Switch Interface US		J1P260TH1	L-70
RMB/Modem		J1P260AA1	L-10
RMB Software Utilities-Boot		107397929	
RMB Utilities (QTY:3)		J1P260TH1	L-73
8-Port Serial Card and Cable Board		J1P260AA1	L-34
		407788439	
Cable		407789080	
Terranova Software		107087280	
25-Pin ESF Int. Adapter		407814201	
9-Pin ESC PC Int. Adapter		407814219	
25-Pin ESC PC Int. Adapter		407814227	
DW8 Cord 14 ft (QTY:2)		103786802	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Passage Direct Connect		407214782	
MERLIN LEGEND ESC Software		407799857	
RMB Integration Sftwr V1.0		J1P260TH1 L-80	
18-port System	61517		
2.5GB Blank Tape (QTY: 3)		407557073	
Color Monitor		406504571	
Snap-on Ferrite (QTY: 6)		407616846	
Keyboard		407681907	
UNIXWare Base Sftwr Tape 5P		ED5P91260 G-18	
Map/5P Tower		J1P260F1 L-1	
V6.0 Map/5P New System Install & Maint Doc		J1P260F1 L-AG	
Base System Boot Sftwr		J1P260TH1 L-1	
INTUITY Bkp/Res Util		J1P260TH1 L136	
ENH Sft Tech Bkp/Res		J1P260TH1 L137	
INTUITY UNIX Mang Scn Pkg		J1P260TH1 L138	
Oracle for W95, NT, 3.1		108007758	
Data Collection Pkg		J1P260TH1 L-28	
Veritas Sftwr		J1P260TH1 L3	
Generic SoftTape		J1P260TH1 L4	
Configuration Data Pkg		J1P260TH1 L5	
Hardware Res		J1P260TH1 L7	
INTUITY CONVERSANT VIS V6.0 Set-Update+		J1P260TH1 L-76	
Tip/Ring Board Driver		J1P260TH1 L-88	
Fea. Test Script Pkg		J1P260TH1 L9	
Call Bridge Appl Pkg		J1P260TH1 L-90	
UNIXWare 1.1.2 Enhance Set		J1P260TH1 L-94	
CA Assy-84000		407265529	
Analog AdapKit 885A (QTY:3)		601419666	
IVC6 Card (AYC10) (QTY:3)		106406580	
25 ft Tel Cord (QTY:4)		103612195	
3 ft Tel Mtg Cord (QTY:6)		ED5P20830 G-16	
BUS Cable		J1P260F1 L8	
Analog Switch Interface US		J1P260TH1 L-70	
RMB/Modem		J1P260AA1 L-10	
RMB Software Utilities-Boot		107397929	
RMB Utilities (QTY:3)		J1P260TH1 L-73	
8-Port Serial Card and Cable		J1P260AA1 L-34	
Board		407788439	
Cable		407789080	
Terranova Software		107087280	
25-Pin ESF Int. Adapter		407814201	
9-Pin ESC PC Int. Adapter		407814219	
25-Pin ESC PC Int. Adapter		407814227	
DW8 Cord 14 ft (QTY:2)		103786802	
Passage Direct Connect		407214782	
MERLIN LEGEND ESC Software		407799857	
RMB Integration Sftwr V1.0		J1P260TH1 L-80	
Optional Equipment			
Additional Supervisor Software			
Terranova Software and cables	61522	107087280	
25-Pin ESF Int. Adapter		407814201	
9-Pin ESC PC Int. Adapter		407814219	
25-Pin ESC PC Int. Adapter		407814227	
Printer and Cable	4200-570	406637314	
Wallboard[8]	5340-WB4/A	407753243	
Wallboard Master Kit	5340-KIT/A	407679174	
Wallboard Stand-alone (within 50 ft)	5340-SKT/A	407743525	
Wireless Keyboard for Wallboard	5332-905/A	407245513	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Right to Use Wallboard Software	61518/A	407799782	
Mandatory Turnkey Install (Sftwr)	61519	407799808	
Incremental Training (1 Day)	61520	407799790	
Incremental Training (2 Days)	61521	407799816	
Sftwr RTU from 5 up to 12 queues	61534/A	407885714	
Sftwr RTU from 5 up to 30 queues	61535/A	407885648	
Sftwr RTU from 13 up to 30 queues	61536A	407885706	
CTI Applications			
Group Phoneware			
5 Seats	6156-205		
10 Seats	6156-210		
25 Seats	6156-225		
50 Seats	6156-250		
Phonetastic			
5 User Right-to-Use	6156-305		
10 User Right-to-Use	6156-310		
25 User Right-to-Use	6156-325		
50 User Right-to-Use	6156-350		
100 User Right-to-Use	6156-400		
System Adjuncts and Adapters			
Channel service units (CSUs)			
T1 CSU (3150 CSU)	21581	107087546	
T1 ESF CSU Stand-alone		107063828	21581-00001
115VAC in line Transformer		406942284	
Converter Cable		107083711	3100-F1-560
RJ48M to RJ48M Unshielded Twisted Pair Cable (T1)		406941559	3110-F1-500
3160-DSU	2151-DP2	107115784	3160-A1-DSU
3164-DSU	2151-DP4	107115792	3164-A1-DSU-CSU
Inactive			
Auxiliary Power Unit 9024		406467142	9024
T1 ESF CSU Stand-alone		107063828	21581-00001
115VAC in line Transformer		406942284	
Converter Cable		107063711	3100-F1-560
RJ48M to RJ48M Unshielded Twisted Pair Cable (T1)		406941559	3110-F1-500
Optional Equipment:			
Unshielded TW Pair Cable (T1) Canada		107063703	3100-F1-510
Straight-Thru Cable PC Serial Port		406941542	3100-F1-550
Straight-Thru Cable Terminal/Printer		406941534	3100-F1-540
Modular DC Voltage Adapter		406941492	3100-F1-250
Wall Mount Kit		406941674	3100-F1-400
Cables for Mounting			
25' D4BU-29 Cord		106472921	ASSY-4400-F1-533
2' D4BU-29 Cord		106472905	ASSY-4400-F1-530
Dial Back Modem FLD		106842271	ASSY-3400-F2-201
Dial Back Modem FAC		106842289	ASSY-3400-G2-201
Dial Back Modem NFLD		106842305	ASSY-4000-F2-201
Dial Back Modem NFAC		106842297	ASSY-4000-G2-201
Prism MUX Field		106842313	ASSY-3400-F2-200
Optional Equipment:			
Peripheral Interface	62515	105179303	KIT PRTS-D181558
Async. Data Unit, Receptacle	2169-004	103963971	Z3A2
RS232 Connector/Cord		105388474	CORD M8AJ-87
Async, Data Unit, Plug	2169-001	103963971	Z3A2
RS232 Connector/Cord		105388466	CORD M8AK-87

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Aux Power (2 required)	21691		
Transformer (2012-D)		102599354	TRNSF-2012D-49
Adapter (248B)		102802113	ADPTR-248B-50
Cord		102937620	CORD-D6AP-87
Adapter (400B)		104152558	ADPTR-400B2
Electrostatic discharge/ (ESD) suppression kits			
D-181574		105179329	D181574
D-181589		105201891	D181589
D-181590		105201909	D181590
D-181591		105201917	D181591
D-181593		105201933	D181593
EMI filter		103965208	Z200A
In-Range Out-of-Building -146E (IROB) unit			
Analog multiline[9]	8310-013	407568161	343B
IROB unit-MLX[9]	8310-013	407568161	505A ASSY 0A WD
Fuse block 505A for IROB (8 fuse blocks per box)		406610337	
2 IROBs	8310-020		
4 IROBs	8310-021		
6 IROBs	8310-022		
8 IROBs	8310-023		
Off-Premises Range Unit	2302-OPT	107531337	122A-215
Digital Magic on Hold®			
Basic Prerecorded			
Package	3128-020		
Digital Deck		407464684	DMOH1DIGITAL
Cassette		407166941	DMOH-02 GENERIC
Personalized Recording			
Package	3128-030		
Digital Deck		407464684	DMOH1 DIGITAL
Cassette		406876664	DMOH-01 PERSONALIZE
Custom Production			
Package (Std. Tape program)	3128-040		
Digital Deck		407464684	DMOH1 DIGITAL
Cassette		406876680	DMOH-05 SIN F/CUST
Stand-alone Single Custom Production Package	31284	405135344	INDIV
Stand-alone Package of 3 Custom Productions	31283	406876649	DMOH-03
Stand-alone Package of 4 Custom Productions	31280	405126632	M4 FOUR
Duplicate of a Custom Production (for Second Location)	31289	405127945	D-IP/EM DUB IND MSTR
Re-License of Music	31288	405127879	D24 24 DUB
Digital Announcer Unit (one minute)	3119-001		
Announcer		407344365	
Recorder		406659342	RCDR-DMOH2
Cassette		406769455	CSTT-DMOH5
Digital Announcer Unit (three minute)	3119-003		
Announcer		407344357	
Recorder		406659342	
Cassette		406659359	
Four Channel System (1-minute recording per channel)	3119-141	407716638	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Four Additional Channels (1-minute recording per channel)	3119-041		
Four Channel System (1-minute recording per channel, remote recording capability)	3271-141	407038512	ADP02/A
Eight Channel System (1-minute recording per channel, remote recording capability)	3271-241	407079003	
Four Channel System (2-minutes recording per channel, remote recording capability)	3271-142	407556232	
Package of 12 Headset Prong Adapters	3122-012		
Package of 12 Headset Modular Adapters (for MLX sets)	3122-024		
Package of 12 Supra Noise Canceling Headpieces	3122-155		
Modem 2224G (limited availability)	2224-CEO	105659965	2224C-L1 D/2
Music Coupler	61398	406143925	ASSY-K23395 L3
PagePac Plus			
PagePac Plus Controller	5323-100	406914598	UNIT-22051-000
PagePac Plus Controller with Power	5323-105		
PagePac Plus 16 Zone	5335-100	406914614	UNIT-22051-016
D20 PagePac Plus Amplicenter	5328-020	406915280	UNIT-22051-020
D100 PagePac Plus Amplicenter	5328-100	406915264	UNIT-22051-100
D300 PagePac Plus Amplicenter	5328-300	406915330	UNIT-22051-300
Universal 70V Door Spkr.	5330-230	406914630	UNIT-22050-070
SMDR Printers			
AP Printer (80-column)	4200-570	406637314	ML182
571Parallel Printer		406516989	571-MCII 6FT
(132-column)	4200-571	406712067	ML321P
AP CAT Printer (serial)	4200-572	406716464	571-MCII 6FT
Uninterruptible Power Supply		406716464	ML182-R2
500 VA (15 min)(inactive)		105610141	515005C111
Reserve (1 hr) (inactive)		105610174	0053150
PagePal Interface	5335-700	407120716	
Audio Visual Paging			
215C Message Center	5332-100		
4120C Message Center	5332-150		
Connector Kit	5332-900		
Wireless Keyboard	5332-905		
Alpha Net Plus Software	5332-910		
R2485 Repeater	5332-915		
External Alerts			
Loud external ringer	31016	407105691	RINGER-L1AMP-49
External ringer	31019		
Supplemental Alerts Universal Alert	5580-001		
Alert Horn	5580-021	406207217	THET4-1
Alert Strobe	5580-041	403319197	AT-WHL LK

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Inactive System Adjuncts and Adapters			
ExpressRoute 1000 Data Unit		107651796	
V.35 Cable		107651275	
7500B data module		105657639	7500B-L1
Stand-alone power supply		405509852	WP90110L7
Multiple mounting		105441166	Z77A
7500A upgrade kit		105688501	D182208
Ring generator unit		105213201	129B RING GEN
Universal Paging		405891698	KIT-UPAM
Access Module (UPAM)			
TAM-B		405899972	D181900
PRS-48		405742735	D181900
WMT-1A		405891680	D181900
Zonemate™ 9			
Dialer unit		404057911	DIAL UNIT-9ZONE
Control unit		405024134	CNTL 22050-020
Zonemate 39			
Dialer unit		404057929	39 ZONE SELECT
Control unit		405024134	CNTL-22050-020C
E1CM ringer and parts	61211		D-181233
290A adapter		102992252	290A ADPTR
Ringer		407105683	E1CM-49
Mounting plate		102988466	1049A
Cord		103938494	CORD-D4CH-87-25
Network Interface Alert Bell	61211	407105683	RINGER-E1CM-49
Telephone Adjuncts and Adapters			
General Purpose Adapter (GPA) (analog)	**2301-GPA**	**103977997**	**Z1C**
Multi-Function Module (digital)	3156-MFM	105746474	540A1
Supplemental Alert Adapter (SAA)	2301-SSA	105031199	ADPTR-856A
MLX-10/ MLX-10D cover		406648469	
MLX Telephone Power Supply	2404-010		
MSP1 Power Supply		406743419	WP92464L1
7' Cord		103786778	
Analog Multiline Telephone Power	62510	105105514	D181522
48V Power Supply		405331711	KS22911L2
Modular Power Cord		102937620	D6AP-87
Z400F Adapter		103942850	Z400F
Single-line telephones			
S202A Speakerphone	3152-008		
Black		105721088	TEL-S202A-003
Misty cream		105721096	TEL-S202A-215
Message-Waiting Indicator	3152-004	103966396	Z34A
Polycom Speakerphones			
Standard	3127-STD	407428697	
Sound Station EX	3127-EXP	407428739	
Lapel Microphone	3127-MIC	407428432	
Lucent Analog Premier EX			
Without Microphone	3127-APE	407795251	
With Microphone	3127-APX	407795269	

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Inactive Single-line Telephones			
Program, Pause, and Auto Dial button conceal kit for 8100-series telephones		106248370	Kit-D 182363 Analog
Speakerphone	3131-004	103786786	D8W-87 7FT
Black		106270325	MOD-CS201A-003
Misty cream		106270333	MOD-CS201A-215
4A Speakerphone			4A
Power unit		102139938	PWR UNIT-85B1
Block connector		102434925	BLK CON-82B-49
Adapter for single-line telephone		102813888	ADPTR-223C
Adapter for multiline telephone		102949013	ADPTR-223D IP
Transmitter (black)		103971891	TRMR-680AF-03
Transmitter (ivory)		103971909	TRMR-680AF-50
Loudspeakers			
Black		103873873	LSPK-108AA-03
Ivory		103873881	LSPK-108AA-50
Green		103873899	LSPK-108AA-51
Beige		103873907	LSPK-108AA-60
White		103873964	LSPK-108AA-58
S201 Speakerphone		103786786	D8W-87 7FT
Black		106192651	MOD-S201AP-003
Misty cream		106192693	MOD-S201AP-215
CS201 Conference			
S203A Speakerphone			
Black		106058340	MOD-S203A-003
Misty cream		106508365	MOD-S203A-215
Hands-Free Unit (HFU)		103814356	MOD-S102A
Headsets and Adapters			
StarSet® Headset	3122-030/A	406445627	KS23822L3
Mirage® Headset	3122-050	406445783	KS23822L4
Supra® Monaural Headset	3122-040	406445791	
Supra NC® Monaural Headset w/ Noise Canceling	3122-055	406445809	
Supra Binaural Headset	3122-045	406976076	
Supra NC Binaural Headset w/ Noise Canceling	3122-060	406445817	
Modular Amplifier	3122-020/A	406741900	KS23822L2
Plug Prong Amplifier	3122-010	406445601	KS23822L1
Inactive Headsets and Adapters			
Headset Adapter		105752042	ADPTR-502C-003
500A Headset Adapter		106690043	Adapter EL-500A-265
		405331711	Pwr Sup-KS2291 1L2
		102479904	Cord-D4BU-29 Std 7FT
		104152558	Adapter-40082

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
MLX Telephones—Miscellaneous Add-Ons/Replacement Parts			
Handsets and Cords			
Handset Hook (black)		845544998	
Handset Hook (white)		845545003	
Handset (black)		106050065	K2S1-003
Handset (white)		106053408	K2S1-264
Handset, amplified hearing	31052		
Black		105581896	K6S2-003
White		106248248	K6S2-264
Misty cream[5]		105581904	K6S2-215
Noise Canceling Handset	31056		
Black		406712463	KS23843L7
White		406712471	KS23843L8
Misty cream[5]		406712489	KS23843L9
High-Noise Canceling Handset	31057		
Black		406712497	KS23843L10
White		406712505	KS23843L11
Misty cream[5]		406712513	KS23843L12
Amplified Speech Handset	31054		
Black		406712406	KS23843L1
White		406712414	KS23843L2
Misty cream[5]		406712422	KS23843L3
Push-to-Talk Handset	31055		
Black		406712430	KS23843L4
White		406712448	KS23843L5
Misty cream[10]		406712455	KS23843L6
Push-to-Listen Handset	31053		
Black		406382344	K8S2-003
White		406382369	K8S2-264
Misty cream[10]		406382351	K8S2-215
Handset cord, 9' (2.74 m), black		105635429	H4DU-003 9 FT
Handset cord, 9' (2.74 m), white		105701809	H4DU-264 9'BULK
Handset cord, 12' (3.66 m), black		102401445	H4DU-3 12FT IP
Handset cord, 12' (3.66 m), white		102402609	H4DU-26412'IP
Handset cord, 25' (7.62 m), black		105523866	H4DU-3 25'
DSS line cord, 2' (61 cm)		106187545	CORD D8AC-87
Desk Stands and User Trays			
Stand (large, black)		846320851	STAND-LARGE BL
Stand (large, white)		846320844	STAND-LARGE WH
Stand (small, black)		846320810	STAND-SMALL BL
Stand (small, white)		846320802	STAND-SMALL WH
User tray (black)		846320240	USER TRAY DWR B
User tray (white)		846320232	USER TRAY DWR W
Designation (Button Assignment) Cards and Covers			
Card[10]—MLX-10, MLX-10D, MLX-10DP, MLX-16DP, MLX-20L, MLX-28D		847355559	
Card set-DSS[11]		106448756	KIT-D182464
Card covers-DSS (black)[11]		106448731	KIT-D182462 PRT
Card covers-DSS (white)[11]		106448749	KIT-D182463 PRT
Card set-QCC[12]		106561673	KIT-D182562 PRT
Card covers[13]—MLX-10, MLX-10D, MLX-20L		106448681	KIT-D182457 PRT
Card covers[13]—MLX-16DP		107499162	KIT-D182846 PRT
Card covers[13]—MLX-28D		106448699	KIT-D182458 PRT

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
Desk Stands and Wall Mounts			
Adjustable desk stand, 10-button (inactive)		103746855	11A
Adjustable desk stand, 34-button (inactive)		103746863	11C
Fixed desk stand, 5- & 10-button (inactive)		103746848	10A
Desk stand/wall mount 14A, BIS-10		103804290	14A-003
Desk stand/wall mount 14B, BIS-22		103964458	Z14B-003
Desk stand/wall mount 14C, BIS-34		103979837	14C-003
Fixed desk stand and wall mount, 5-button (inactive)		103804290	14A
Kit of parts		103995882	D-181230
Wall mount, 10-button (inactive)		103747846	201A
Kit of parts		103995882	D-181230
Wall mount, 34-button (inactive)		103747853	203A
Kit of parts		103995882	D-181230
Faceplates			
BIS-10		105203186	KIT PRTS-D-181582
BIS-22		105336986	KIT PRTS-D-181786
BIS-22D		105690762	KIT PRTS-D-182210
BIS-34 and BIS-34D		105203194	KIT PRTS-D-181583
Button Label Sheets			
BIS-10		105336978	KIT PRTS-D-181785
BIS-22		105336960	KIT PRTS-D-181784
BIS-22D		105690770	KIT PRTS-D-182211
BIS-34 and BIS-34D		105336956	KIT PRTS-D-181783
Display console (FM1) (includes one faceplate)		105299754	KIT PRTS-D-181727
Display console (FM2 & R3) (includes one faceplate)		105486252	KIT PRTS-D-182041
Single-Line Telephones—Miscellaneous Add-Ons			
Ground-Start Button	**31021**	**405792839**	**Key-KS23566L1**
Wiring Kits			
Interconnect Wiring Kit			
110AB1-100JP12		104409396	
110A1 trough		104407960	
D-Rings		842139248	
D8W cords		103786802	
Parts list			

Ordering Codes (Continued)

Component	PEC/SAP	Comcode	App. Code
SYSTIMAX®			
MERLIN Wiring Kit	3103-MER	106393671	
110A1 trough (5)		104407960	
110AB1-100JP12 modular block (2)		104409960	
110AB1-100 FT punch down block (1)		103823845	
D-Rings (6)		842139248	
Patch cords 12 cords, 4-pair, 5' (1.5 m)		846619989	
D8W cords 24 cords, 14' (4.3 m)		103786802	
Template		846613933	
Instruction sheet		846613941	
Parts List		846623924	
CAT 3 Standard 4-Pair Wire	2782-004		
CAT 3 Additional 4-Pair Run	2783-MU3		
CAT 5 Standard 4-Pair Wire	2782-CT5		
CAT 5 Additional 4-Pair Run	2782-MU5		

1 Customer Reference CD-ROM contains the *Feature Reference*, *System Programming*, the *System Manager's Guide*, and the *Network Reference*. To order paper documents, use PEC 61512/A comcode 108370255.
2 For systems that have a CKE4 processor.
3 For R5/R6.0/R6.1 customers that have a multi-year maintenance contract.
4 Default.
5 Customer must sign an addendum, if sold.
6 Consult Lucent Technologies for other area-specific information.
7 Includes the following documentation: the *System Manager's Manual*, the *Implementation and Service Manual*, the *Quick Reference Guide*, Wallet Cards, Worksheets, and *Implementation and Service Release Notes*.
8 Wallboard also referred to as "Readerboard."
9 Any multiline off-premises telephone must have an appropriate IROB protector both at the control unit location and at the off-premises location.
10 10 sheets per package.
11 Includes both top and bottom cards or covers.
12 8 cards per kit (four sets).
13 4 per package.

NOTES

Control Unit Modules

Module	Trunk Type	Extension Type
Processor	N/A	N/A
Power supply	N/A	N/A
008 (ATL)	N/A	Analog multiline telephones
008 MLX[1]	N/A	MLX extensions, including: ■ MLX voice only ■ MLX voice with Voice Announce to Busy ■ MLX voice and Multi-Function Module (MFM) with T/R adjunct ■ MLX voice and MFM with Supplemental Station Adapter (SSA) ■ ISDN terminal adapter only ■ Access device for data communications between a PC on the system and a high-speed Internet connection, connection to remote node LAN access server, or ISDN router[2] ■ Computer Telephony Integration (CTI) link[3] ■ Videoconferencing systems using one jack and 2B data feature or 2 jacks with ISDN terminal adapters (depending on video system)[2]
008 OPT[4]	N/A	On-premises or off-premises single-line telephones

1 For newer vintages of this module, firmware can be upgraded by using a PCMCIA card.
2 For Release 4.0 and later systems only.
3 For Release 5.0 and later systems only.
4 System software recognizes the OPT module as an 012 (T/R) module. Even though the OPT module has only 8 jacks, it uses 12 ports of capacity, thereby decreasing overall extension capacity by 4 extensions for every OPT module.

Specifications

Highlights: 68EC020 processor at 16 MHz, built-in 1200/2400-bps modem; built-in diagnostics; Hybrid/PBX, Key, or Behind Switch mode option; 1.5 MB RAM backup for 4 days; PCMCIA interface
Ports: 3 RS-232-C ports—1 for debugging (plugged to prevent access), one for SMDR, and 1 for system administration

Power input: 117 VAC
Power output: +5 VDC (10 A), -5 VDC (2.50 A), -48 VDC (2.05 A)
Capacity: 54 unit loads

Capacity: 8 analog extension jacks
Signaling: Analog multiline telephone protocol (40 kbps)
Loop range: 1000 feet (305 m), in-building or in-range out-of-building (with analog IROB protectors) only

Capacity: 8 digital extension jacks, each with 1 or 2 extensions (each extension is assigned an individual extension number)
Signaling: BRI S/T protocol (two 64-kbps B channels, one 16-kbps D channel) on a passive bus
Power: 48 VDC phantom power to telephone, 48 VDC over a separate pair (7–8) to an operator console with a DSS
Loop range: 3000 feet (914 m), in-building or in-range out-of-building (with MLX IROB protectors) service only

Capacity: 8 T/R extensions on 2-way voice transmission path with support for telephones with message waiting lights, 2 TTRs
Ringing current: 75-Vrms, 20-Hz trapezoidal ringing superimposed on -48 VDC.
REN: ≤ 1.0 per port
Disconnect signal: 900 ms (T/R short for analog modem, G3 fax, etc.)
Switchhook flash detection: 300–1200 ms
Loop resistance: Serves 2-wire loops to 1300 ohms, including extensions
dB loss[1]: 3dB (factory setting), 0dB if all calls are to another OPT station.

1 If one OPT station calls another OPT station, the loss values of the two OPT stations are added resulting in transmission levels that are too low.008 OPT modules (517D28) may be hardware configured to 0dB loss, however this should only be done if all or the majority of calls from the OPT stations are to other OPT stations. Setting the loss value to 0dB violates EIA-464-A-1 specifications. Contact Tier 4 before modifying the loss value settings of 008 OPT modules.

Control Unit Modules *—Continued*

Module	Trunk Type	Extension Type
012 (T/R)	N/A	Single-line telephones; Intuity AUDIX®; Messaging 2000; T/R adjuncts (such as answering or fax machine); analog data devices (such as modems)
016 (T/R)[1]	N/A	Single-line telephones; Intuity AUDIX®; Messaging 2000; T/R adjuncts (such as answering or fax machine); analog data devices (such as modems)
016 ETR[2,3]	N/A, TTR	All ports, when programmed for ETR: MLS, ETR, Business Cordless 905, and TransTalk MDC and MDW telephones. Ports 11–16 when programmed for T/R: any T/R device such as single-line telephones; Intuity AUDIX®; Messaging 2000; T/R adjuncts (such as answering or fax machine); analog data devices (such as modems)
016 MLX[2,3]	N/A	MLX extensions, including: ■ MLX voice only ■ MLX voice with Voice Announce to Busy ■ MLX voice and MFM with T/R adjunct ■ MLX voice and MFM with SSA ■ ISDN terminal adapter only ■ Access device for data communications between a PC on the system and a high-speed Internet connection, connection to remote node LAN access server, or ISDN router[1] ■ CTI link[4] ■ Videoconferencing systems using one jack and 2B data feature or 2 jacks with ISDN terminal adapters (depending on video system)[1]

1 For Release 4.0 and later systems only.
2 For newer vintages of this module, firmware can be upgraded by using a PCMCIA card.
3 For Release 7.0 and later systems only.
4 For Release 5.0 and later systems only.

Specifications

Capacity: 12 T/R extensions on 2-way voice transmission path with support for telephones with message-waiting lights, 2 TTRs
Ringing current: 105-Vrms, 30-Hz sinusoidal ringing superimposed on -48 VDC
REN: ≤ 4.0 per port
Disconnect signal: 900 ms (T/R short for analog modems, G3 fax, etc.)
Switchhook flash detection: 300–1200 ms

Capacity: 16 T/R extensions on 2-way voice transmission path with support for telephones with message waiting lights, 4 TTRs
Power: 40-VDC, 600-ohm battery source
Ringing current: 105-Vrms, 30-Hz sinusoidal ringing superimposed on -48 VDC
REN: ≥ 4.0 per port
Disconnect signal: 900 ms (T/R short for analog modems, G3 fax, etc.)
Switchhook flash detection: 300–1200 ms

Capacity: 16 ETR station ports including 6 with T/R functionality and 4 TTRs. First 10 ports are ETR ports only; remaining 6 ports can support either T/R or ETR, but not both simultaneously
Power: -48V for ETR and -49V normal for T/R
Ringing current: 20/25 Hz balanced trapezoidal ring signal
REN: 2 per port
Off-hook detection: ≥18mA, ≤30ma, ≥20 msec for T/R; massage control for ETR
On-hook detection: ≤14mA for T/R; massage control for ETR
T/R switchhook flash detection: 300-1200 ms

Capacity: 16 digital station ports
Signaling: BRI S/T protocol (two 64-kbps B channels, one 16-kbps D channel) on a passive bus
Power: 48 VDC phantom power to telephone, 48 VDC over a separate pair (7–8) to an operator console with a DSS
Loop range: 3000 feet (914 m), in-building or in-range out-of-building (with MLX IROB protectors) service only

Control Unit Modules—*Continued*

Module	Trunk Type	Extension Type
100D[1]	T1 or PRI	T1 emulates 24 lines/trunks: loop-start, ground-start, tie, and Direct Inward Dial (DID; Hybrid/PBX mode only); can also supply subscriber services. In Release 4.0 and later, T1 can also provide high-speed (56K) data communications and digitally emulated tie trunks for data communications. PRI supports subscriber services, allows high-speed digital data communications, and includes special features.
400 LS[2]	Loop-start and TTR	1 PFT telephone
400EM	Tie trunk	N/A
400 GS/LS	Loop-start or ground-start and TTR	PFT telephone (button needed for ground-start PFT telephone)
408 (LS-ATL)[2]	Loop-start	Analog multiline telephones; CMS; 1 PFT telephone
408 GS/LS	Loop-start or ground-start	Analog multiline telephones; CMS; 1 PFT telephone with GS button

1 For newer vintages of this module, firmware can be upgraded by using a PCMCIA card.

2 Although this MERLIN® II modules is supported, the following are recommended for the system: 400 GS/LS, 408 GS/LS, 408 GS/LS-MLX, 800 GS/LS, and 800 GS/LS-ID.

Specifications

Capacity: 24 channels ("virtual" lines/trunks) for voice and analog data or for digital data only (T1); or 23 B-channels for voice and data, and 1 channel used for signaling (PRI). Supports networking in Release 6.0 and later systems, Hybrid/PBX mode only.
Mode: Multiplexes up to 24 channels into 1 facility and demultiplexes 1 facility into up to 24 channels.
Speed: Up to 64 kbps
Signaling: DS1 over 4-wire; Apparatus code earlier than 517M15, T1 uses robbed-bit or common-channel; apparatus code 517M15 and later, common channel is not an option for T1; PRI uses 23 B+D

Capacity: 4 loop-start lines/trunks for 2-way analog voice/data communication, 4 TTRs
Signaling: Loop-start

Capacity: 4 analog tie trunks. Supports networking in Hybrid/PBX mode only
Method of completion: Automatic start, immediate-start, wink-start, or delay-dial-start
Signaling: E&M type 1S, type 1C, type 5

Capacity: 4 ground-start and/or loop-start lines/trunks for 2-way analog voice/data communication, 4 TTRs
Signaling: Loop-start or ground-start, optioned per port

Capacity: 4 loop-start lines/trunks for 2-way analog voice/data communication, 8 extensions
Extension signaling: Analog multiline telephone (40 kbps)
Trunk signaling: Loop-start trunk, analog voice
Loop range: 1000 feet (305 m), in-building or in-range out-of-building (with analog IROB protectors) only

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Capacity: 4 ground-start and/or loop-start lines/trunks for 2-way analog voice/data communication, 8 extensions
Extension signaling: Analog multiline telephone (40 kbps)
Trunk signaling: Loop-start or ground-start trunk (optional per port); voice
Loop range: 1000 feet (305 m), in-building or in-range out-of-building (with analog IROB protectors) only

Control Unit Modules—*Continued*

Module	Trunk Type	Extension Type
408 GS/LS-MLX[1]	Loop-start or ground-start	1 PFT telephone
408 GS/LS-ID-MLX[1,2]	Loop-start or ground-start	1 PFT telephone; Caller ID[3]

1 For Release 2.0 and later systems only.
2 For newer vintages of this module, firmware can be upgraded by using a PCMCIA card.
3 For Release 7.0 and later systems only.

Specifications

Capacity: 4 ground-start and/or loop-start lines/trunks, 8 digital extension jacks for MLX extensions, including:

- MLX voice only
- MLX voice with Voice Announce to Busy
- MLX voice and MFM with T/R adjunct
- MLX voice and MFM with SSA
- ISDN terminal adapter only
- Access device for data communications between a PC on the system and a high-speed Internet connection, connection to remote node LAN access server, or ISDN router[1]
- CTI link[2]
- Videoconferencing systems using one jack and 2B data feature or 2 jacks with ISDN terminal adapters (depending on video system)[1]

Extension signaling: BRI S/T protocol (two 64-kbps B channels, one 16-kbps D-channel) on a passive bus

Trunk signaling: Loop-start or ground-start trunk (optional per port), analog voice

Loop range: 3000 feet (914 m), in-building or in-range out-of-building (with MLX IROB protectors) only

Protocol: Requires calling name (R7.0 and later) and/or number identification service from central office

Capacity: 4 ground-start and/or loop-start lines/trunks, 8 digital extension jacks for MLX extensions, including:

- MLX voice only
- MLX voice with Voice Announce to Busy
- MLX voice and MFM with T/R adjunct
- MLX voice and MFM with SSA
- ISDN terminal adapter only
- Access device for data communications between a PC on the system and a high-speed Internet connection, connection to remote node LAN access server, or ISDN router[1]
- CTI link[2]
- Videoconferencing systems using one jack and 2B data feature or 2 jacks with ISDN terminal adapters (depending on video system)[1]

Extension signaling: BRI S/T protocol (two 64-kbps B channels, one 16-kbps D channel) on a passive bus

Trunk signaling: Loop-start or ground-start trunk (optional per port), analog voice

Loop range: 3000 feet (914 m), in-building or in-range out-of-building (with MLX IROB protectors) only. If adjuncts (MFM or DSS) are used, auxiliary power must be in place

Protocol: Requires calling name (R7.0 and later) and/or number identification service from central office

1 For Release 4.0 and later systems only.
2 For Release 5.0 and later systems only.

Control Unit Modules—*Continued*

Module	Trunk Type	Extension Type
800 (LS)[1]	Loop-start	2 PFT telephones
800 DID	Direct Inward Dialing and TTR	N/A
800 GS/LS	Loop-start or ground-start and TTR	2 PFT telephones with GS button (if using GS lines/trunks)
800 GS/LS-ID[1,2]	Loop-start or ground-start	2 PFT telephones; Caller ID (loop-start trunks only), if you subscribe to caller identification from the local telephone company, displays the number of incoming callers, and in R7.0 and later, the name of incoming callers as well, on MLX, MLS, and ETR display telephones
800 NI-BRI[1]	T1 NI-BRI interface	Voice, data, video, and other services at 64 kbps over standard ISDN lines/trunks
MERLIN LEGEND Mail 007 MLM[3]	none	Supports: MERLIN LEGEND Mail Voice Messaging System; resides on this module and the internal T/R jacks can be used only for this application

1 Although this MERLIN® II module is supported, the following are recommended for the system: 400 GS/LS, 408 GS/LS, 408 GS/LS-MLX, 800 GS/LS, and 800 GS/LS-ID.
2 For Release 3.0 and later systems only.
3 The system software recognizes the MERLIN LEGEND Mail VMS module as a 012 (T/R) module. Even though the module has a maximum of 7 T/R internal ports, including the modem jack, it uses 12 ports of capacity in any of its three configurations.

Specifications

Capacity: 8 loop-start lines/trunks for 2-way analog voice/data communications, 2 PFT telephones
Signaling: Loop-start

Capacity: 8 lines/trunks, 2 TTRs
Transmission: Incoming calls only; 2-way (1-pair) fixed impedance to DID trunks; no outgoing calls
Signaling: Loop-reverse battery; wink-start or immediate-start; accepts touch-tone dialing

Capacity: 8 ground-start and/or loop-start lines/trunks
Signaling: Loop-start or ground-start

Capacity: 8 ground-start and/or loop-start lines/trunks; 2 TTRs
Signaling: Loop-start or ground-start
Protocol: Requires calling name (R7.0 and later) and/or number identification service from central office

Capacity: 8 BRI facilities, each with 2 B-channels (“virtual” lines) for voice and data and 1 channel used for signaling
Speed: Up to 64 kbps
Signaling: ISDN Basic Rate 2B+D

Capacity: 7 internal, system-defined T/R jacks; 2 TTRs; internal remote maintenance device; serial port for PC connection

Adjunct Summary

Equipment Type	Specifications	Lucent Technologies Products
Alerts (AC)[1]	■ Any audible or visual alert that operates on 20–30 Hz ringing signals. ■ Associated with a specific extension (supplemental alert) or works on a programmed trunk port (external alert).	External Ringer—Loud External Ringer
Alerts (DC)	■ Any audible or visual alert that operates on 48-VDC signals. ■ Associated with a specific extension (supplemental alert) or works on a programmed trunk port (external alert). **Note:** 48-VDC is supplied via the white/green pair on an MFM in SSA mode or an analog SSA device	Alert bell Alert horn Alert strobe Alert chime Alert deluxe horn Alert switch
Answer/ record machine[1]	■ Industry-standard machine. ■ Low ringer equivalence (less than 0.15 or (4.0[2] total REN for T/R port.) ■ Ability to recognize 600-ms disconnect signal or other means of automatic disconnect (such as voice reset disconnect timer, fixed recording time).	Model 1300 Answering Machine Model 1531 Remote Answering System telephone

1 Cannot be connected to a QCC.
2 Latest 012 T/R Module (517H13).

Interface				
LS or GS/LS	**T/R**	**MFM**	**GPA**	**SAA**
Line/ Trunk Jack	**T/R Extension Jack[1]**	**MLX Extension Jack**	**Analog Extension Jack**	**Analog Extension Jack**
	✓	✓	✓	
✓		✓		✓
	✓	✓	✓	

1 T/R jacks on an 012 (T/R) or 016 (T/R) module, or for Release 7.0 and later systems, jacks programmed for T/R operation on an 016 ETR module.

Adjunct Summary—*Continued*

Equipment Type	Specifications	Lucent Technologies Products
Cordless Telephone[1]	■ Must have touch-tone dialing capability when connected via MFM; rotary or touch-tone dialing can be used on T/R port. ■ Single line.	5650 Cordless Telephone 5481 Cordless Telephone 5552 Cordless Telephone
Credit Card Verification Terminal[1]	■ Must have touch-tone dialing capability when connected via MFM; rotary or touch-tone dialing can be used on T/R port.	N/A
Dial Dictation[1]	■ A device that requires contact closure can be used on LS/GS line jack only with UPAM.	N/A
Direct Station Selector	■ A maximum of 2 DSSs can be connected to an operator console. ■ A 329A power unit must be added to an operator console having 2 DSSs. ■ Connects to DSS jack on operator console.	Direct Station Selector (DSS)

1 Cannot be connected to a QCC.

Interface				
LS or GS/LS	**T/R**	**MFM**	**GPA**	**SAA**
Line/ Trunk Jack	**T/R Extension Jack[1]**	**MLX Extension Jack**	**Analog Extension Jack**	**Analog Extension Jack**
	✓	✓	✓	
	✓	✓		
✓	✓	✓	✓	

1 T/R jacks on an 012 (T/R) or 016 (T/R) module, or for Release 7.0 and later systems, jacks programmed for T/R operation on an 016 ETR module.

Adjunct Summary—*Continued*

Equipment Type	Specifications	Lucent Technologies Products
Fax[1]	■ Must have touch-tone dialing capability when connected via MFM; rotary or touch-tone dialing can be used on T/R port. ■ Industry-standard analog interface.	
Group Calling Delay Announcement[1]	■ Industry-standard announcement device. ■ Must provide automatic disconnect. ■ Each calling group can have its own announcement (maximum 32). For Release 5.0 and later systems, each calling group can have 10 primary announcement devices and 1 secondary announcement device. ■ A device can provide delay announcement for more than one group.	Model 1330 Answering Machine Digital Announcement Device, Model 18A for single unit; Model 15A for 4-port unit
Hands-Free Unit	■ For use with analog multiline telephones. ■ Connects directly to telephone.	502A
Headset for analog multiline telephone	N/A	Starset Mirage Supra Supra NC

1 Cannot be connected to a QCC.

Interface				
LS or GS/LS	**T/R**	**MFM**	**GPA**	**SAA**
Line/ Trunk Jack	**T/R Extension Jack[1]**	**MLX Extension Jack**	**Analog Extension Jack**	**Analog Extension Jack**
	✓ (can also use 008 OPT Extension Jack)	✓		
	✓	✓		

1 T/R jacks on an 012 (T/R) or 016 (T/R) module, or for Release 7.0 and later systems, jacks programmed for T/R operation on an 016 ETR module.

Adjunct Summary—*Continued*

Equipment Type	Specification	Lucent Technologies Products
Headset for MLX telephone	(N/A)	Starset Mirage Supra Supra NC
Headset Adapter	■ Connects directly to telephone OTHER jack.	
Loudspeaker Paging	■ External paging system using DTMF signaling connected to LS or GS line jack. ■ CPE paging systems require an interface unit; if CPE has 2-wire input, the PagePal interface (5335-700) can be used.	PagePac Plus Amplicenters D20, D100, D300 PagePac Plus Controller PagePac 6 PagePac 6 Plus
Message Waiting Indicator	■ For single-line telephones. ■ Connects directly to telephone.	Z34A (PEC 3 1032)
Modem	■ If the modem supports touch-tone dialing via the associated data terminal, the keyboard can be used for dialing. ■ If the modem does not support touch-tone dialing, an associated basic (single-line) telephone can be used for dialing.	

Interface				
LS or GS/LS	**T/R**	**MFM**	**GPA**	**SAA**
Line/ Trunk Jack	**T/R Extension Jack[1]**	**MLX Extension Jack**	**Analog Extension Jack**	**Analog Extension Jack**
✓				
	✓			
	✓	✓	✓	

1 T/R jacks on an 012 (T/R) or 016 (T/R) module, or for Release 7.0 and later systems, jacks programmed for T/R operation on an 016 ETR module.

Adjunct Summary—*Continued*

Equipment Type	Specifications	Lucent Technologies Products
Music-On-Hold[1]	■ Any FCC-registered 8-ohm music source or recorded announcement device.	Magic On Hold
Speakerphone	■ Connect directly to telephone. ■ For single-line telephones only.	203A (PEC 3131-008)
SMDR Printer	■ Connects to upper RS-232-C jack on processor module. ■ Must be located within 50 feet (15 m) of control unit or use ADU to extend distance.	CAT Terminal printers

1 If you use equipment that rebroadcasts music or other copyrighted materials, you may be required to obtain a copyright license from and pay license fees to a third party, such as the American Society of Composers, Artists, and Producers (ASCAP) or Broadcast Music Incorporated (BMI). Or you can purchase a Magic on Hold system, which does not require you to obtain such a license, from Lucent Technologies or an authorized dealer.

Interface				
LS or GS/LS	**T/R**	**MFM**	**GPA**	**SAA**
Line/ Trunk Jack	**T/R Extension Jack[1]**	**MLX Extension Jack**	**Analog Extension Jack**	**Analog Extension Jack**
✓[2]				
	✓			

1 T/R jacks on an 012 (T/R) or 016 (T/R) module, or for Release 7.0 and later systems, jacks programmed for T/R operation on an 016 ETR module.
2 Music Coupler required (PEC 61398).

Power Supply Unit Load Requirements

Unit Load Calculation Rules

Mode	Installed Modules	Calculation
Hybrid/PBX, Modified Key, or Behind Switch	6[1]	Not required.
Square Key or Behind Switch	4 or fewer[2]	Not required.
Square Key or Behind Switch	5 or more	Use the "Unit Load Rating of System Modules" table and instructions below to determine the estimated unit loads (ULs): ■ If the ULs < 96 and the 391C1power supply is used, or the ULs < 72 and the 391A3 power supply is used, then no calculation is required. If a 391A1 or 391A2 power supply is used and the ULs > 48, then replace the power supply with a 391C1 power supply. ■ If ULs > 96, reconfigure the system so that the total ULs does not exceed 96 per carrier. For more information on unit load calculation, refer to Appendix F of *System Planning*.

1 The 391A1 and 391A2 power supply units generally support 6 modules of any type in Hybrid/PBX mode. However, if all 6 carrier slots meet the following conditions, the unit load total may exceed 48:

Only MLX or analog multiline station modules are installed.

More than 45 MLX-20L or 34-button analog multiline telephones are installed.

The 391C1 and 391A3 power supplies have maximum ratings of 96 and 72 unit loads respectively. Use these power supplies in place of a 391A1 or 391A2 on systems where unit loads will exceed 48.

2 The 391A1 power supply unit generally supports 4 modules of any type in Square Key mode.

Power Supply Unit Load Requirements—*Continued*

Unit Load Rating of System Modules

Module	Unit Load	Module	Unit Load
008	12.0	408 GS/LS	12.0
008 MLX	13.5	408 GS/LS-ID-MLX	12.0
008 OPT	8.0	408 (LS)	12.0
012 T/R	7.2[1]	412 LS/ETR	18
016 ETR	24	800 GS/LS	0.0
016 T/R	12.8	800 GS/LS-ID	0.0
100D (DS1)	0.0	800 (LS)[2]	0.0
400 GS/LS/TTR	0.0	800 DID	8.0
400 (LS)[2]	0.0	800 NI-BRI	0.0
400EM	8.0	Processor	0.0

1 012 modules older than 517H13 may have a unit load up to 8.4.
2 This is a MERLIN II loop-start-only module that can be used in the MERLIN LEGEND Communications System.

Power Supply Unit Load Requirements—*Continued*

Unit Load Rating of System Trunks, Telephones, and Adjuncts

Network Access Trunks[1]	Unit Load
DID	1.0
DS1	0.0
GS/LS	0.0
Tie	1.4
Telephones	
MLX-5, MLX-5D	.9
MLX-10, MLX-10D, and MLX-10DP	1.2
MLX-16DP	1.5
MLX-28D	1.7
MLX-20L	1.6
BIS-10	1.1
BIS-22 and BIS-22D	1.3
BIS-34 and BIS-34D	1.5
MLC-5	0.0
MDC 9000	0.0
MDW 9000	0.0
5-Button	0.8
10-Button Basic	1.1
10-Button HFAI	1.2
34-Button Basic	1.1
34-Button DLX	1.7
34-Button BIS	1.4
34-Button BIS/DIS	1.4
ETR-6	0.8
ETR-18	0.9
ETR-18D	1.0
ETR-34D	1.0
MLS-6	0.7
MLS-12	0.8
MLS-12D	0.8
MLS-18D	0.8
MLS-34D	0.9
Single-line telephone	0.7

Unit Load Rating of System Trunks, Telephones, and Adjuncts (Continued)

Optional Equipment	
EICON board (CTI link interface in NetWare server)	0.0
EICON DIVA 2.1or later board (CTI link interface in Windows NT platform)	0.0
DSS console[2]	0.9
MFM[3]	1.3
General Purpose Adapter	1.0
Hands-Free Unit	1.0
Headset adapter	1.0

1 Unit loads are computed per trunk.
2 Up to 2 DSS consoles (one DSS per MLX-28D or MLX-20L) can be powered from each control unit carrier. For example, a 3-carrier system can have 6 system operator positions, each with one DSS powered from the control unit.
3 The MFM is powered by an individual wall power unit located at the station.

System Feature Availability by Operating Mode

	Mode		
Feature	**PBX**	**Key**	**Behind Switch**
Account Code Entry	✓	✓	✓
Authorization Codes	✓	✓	✓
Automatic Maintenance Busy	✓	✓	✓
Automatic Route Selection	✓		
Callback	✓	✓	✓
Calling Restrictions	✓	✓	✓
Centralized Voice Messaging	✓		
Centrex Transfer via Remote Call Forwarding	✓	✓	✓
Coverage	✓	✓	✓
Coverage VMS Off	✓	✓	✓
CTI Link	✓		
Delayed Ring interval	✓	✓	✓
Direct Inward Dialing	✓		
Direct-Line Console options	✓	✓	✓
Direct Voice Mail	✓	✓	
Directory	✓	✓	✓
Extension Status	✓	✓	✓
Forced Account Code Entry	✓	✓	✓
Group Calling[1]	✓	✓	✓
Headset Status	✓	✓	✓
Hold disconnect	✓	✓	✓
Inside dial tone	✓	✓	✓
Labeling	✓	✓	✓
Language selection	✓	✓	✓
Loudspeaker Paging	✓	✓	✓
Microphone Disable	✓	✓	✓
Night Service	✓	✓	✓
Paging groups	✓	✓	✓
Park	✓	✓	✓
Pickup groups	✓	✓	✓
Pools (trunk groups)	✓		
Queued Call Console options	✓		
Recall interval	✓	✓	✓

System Feature Availability by Operating Mode—*Continued*

	Mode		
Feature	**PBX**	**Key**	**Behind Switch**
Reminder Cancel	✓	✓	✓
Remote Access	✓	✓	✓
Remote Call Forward	✓	✓	✓
Service Observing	✓	✓	✓
Station Message Detail Recording	✓	✓	✓
System Numbering	✓	✓	✓
System Restart	✓	✓	✓
System Speed Dial	✓	✓	✓
Tandem Trunking	✓	✓	✓
Toll Type	✓	✓	✓
Touch-tone or rotary signaling	✓	✓	✓
Transfer options	✓	✓	✓
Uniform Dial Plan (UDP)	✓		
Voice Announce	✓	✓	✓

1 Non-local members may be assigned to calling groups in PBX mode only.

K Key mode
P Hybrid/PBX mode
B Behind Switch mode

Telephone and Operator Console Features

Feature	Program Code	Feature Code
Account Code Entry	*82	82 + code
Alarm[1]	*759	
Authorization Code	*80	80 + code
Auto Answer All	*754	
Auto Answer Intercom	*753	
Auto Dial		
Inside (ext., group, zone)	*22 + ext. no.	
Outside	*21 + tel. no.	
Automatic Line Selection		
Begin Sequence	*14	
End Sequence	**14	
Barge-In[1,2]	*58	
Callback		
Automatic		
On	*12	
Off	**12	
Selective	*55	55
Cancel selective		*55 (single-line sets only)

1 System operator feature only.
2 Centralized telephone programming only.

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB	KP	KPB	KPB	KPB	KPB
	KPB	KPB			KPB		
KPB	KPB	KPB	KP	KPB	KPB	KPB	KPB
					KPB		
					KPB		
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB	KP	KPB	KPB	KPB	KPB

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Caller ID (name/number toggle)	*763	763
Call Waiting		
On	*11	
Off	**11	
Call Waiting Pickup		87
Camp-On	*57	57
Conference	*772	772
Contrast		
Coverage		
Receiver buttons		
Group	*42 + ext. no.	
Primary	*40 + ext. no.	
Secondary	*41 + ext. no.	
Sender buttons		
Cover inside & outside calls	*48	
Cover outside calls only	**48	
Coverage Off	*49	
Coverage VMS Off	*46	
Data Status	*83 + ext. no.	
Direct Voice Mail	*56	56 + ext. no.
Directory		
System Directory	(system programming)	
Extension Directory	(display only)	
Personal Directory	(display only)	
Do Not Disturb	*47	
Drop	*773	773

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB			KPB	KPB	KPB
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
B	B	B		B	B	KPB	KPB
KPB	KPB	KPB			KPB		
KPB	KPB	KPB		KPB	KPB	KPB	KPB
			KPB KPB KPB KPB				
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KP	KP	KP	KP	KP	KP	KPB	KPB
KPB KPB	KPB KPB	KPB KPB KPB					
KPB	KPB	KPB		KPB	KPB	KPB	KPB
B	B	B		B	B	KPB	KPB

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Extension Status		
Direct-Line Console[1]		
Status Off	*760	760 + DSS button
Status 1	*761	761 + DSS button
Status 2	*762	762 + DSS button
Telephones (rooms or agents)		
Status Off		*44
Status 1	*45	45
Status 2	*44	44
Feature button	*20	
Forward and Follow Me		
Activate		
Forward (inside)	*33	33 + ext. no.
Remote Call Forward	*33	33 + tot. no. + #
Follow Me		34 + ext. no.
Cancel		
At originating extension		33 + own ext. no.
At destination extension		
Cancel one		*34 + ext no.
Cancel all		*34*
Group Calling		
In-Queue Alarm button	*22 + calling group ext. no.	
Calling group supervisor		
Enter supervisor mode[1]		32 + Hold
Exit supervisor mode[1]		32 + Drop
Available (ES Status 2)	*762	762 + DSS button
Unavailable (ES Status Off)	*760	760 + DSS button
Calling group members		44
Sign in (Available)	*44	*44
Sign out (Unavailable)		
After-call work state (CMS only)	*45	45

1 System operator feature only.

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
	KPB	KPB			KPB		
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
					KPB		
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
	KPB	KPB			KPB		
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB KPB KPB KPB KPB KPB

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Group Page Auto Dial button	*22 + paging group ext. no.	
Headset Options		
Auto Answer	*780	
Hang Up[1]	*781	
Mute (Headset/Handset)	*783	
Status	*782	
Hold		771
Hold Release		**
Intercom buttons		
Assign buttons[1]		
ICOM (Default Ring)	*16	
ICOM Originate Only	*18	
Change button type		
Place Ring	**19	
Place Voice	*19	
Language		
English		790
French		791
Spanish		792
Last Number Dial	*84	84
Messaging		
Leave Message		
After calling	*25	25
Without calling		53 + ext. no.
Cancel message left		*53 + ext. no.
Message LED off (for non-display telephones	*54	54
Message operation mode (for ETR, MLS and analog multiline display telephones)[2]	*54	54
Posted Message	*751	
Send/Remove Message[3]	*38	38 + ext. no.

1 Centralized telephone programming only.

2 Used to enter/exit Message operation mode. MLS and analog multiline telephones return to normal call handling after 15 seconds if the user has no messages. If an MLS or analog multiline telephone user has messages, the user must delete the messages or use the feature code or programmed button to exit Message operation. For ETR telephones, the feature code or programmed button must be used to exit Message operation mode regardless of whether the user has messages.

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

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB			
B	B	B		B	B	KPB	KPB
B	B	B	B	B	B	B	B
K B	K B	K B		K B	K B	K B	K B
			K B				
			K B				KPB
							KPB
							KPB
							KPB
KPB	KPB	KPB		KPB		KPB	
KPB	KPB	KPB	K P	KPB	KPB	KPB	KPB
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
						KPB	KPB
	KPB	KPB			KPB		
					KPB		

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Messaging (continued)		
Receiving messages		
Delete Message[1]	*26	26
Next Message[1]	*28	28
Return Call[1]	*27	27
Scroll[1]	*29	29
Night Service[2]	*39	39
Notify		
Send	*757 + ext. no.	
Receive	*758 + ext. no.	
Park	*86	
Park Zone Auto Dial[2]	*22 + Park Zone	
Personal Speed Dial	# + (01-24) + *21 + tel no. + ##	01-24
Personalized Ringing	*32 + ring (1–8)	
Pickup		
General use	*9	
Specific extension	*9 + ext. no.	9 + ext. no.
Specific line	*9 + line no.	9 + line no.
Group	*88	88
Position Busy[2]	*750	
Privacy		
On	*31	31
Off		*31
Recall	*775	775

1 Display telephones only. Programming and feature codes are used with analog multiline telephones only.
2 System operator feature only.

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB			KPB	KPB	KPB
KPB	KPB	KPB			KPB	KPB	KPB
KPB	KPB	KPB			KPB	KPB	KPB
					KPB	KPB	KPB
	KPB	KPB			KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB	K P	KPB	KPB	KPB	KPB
	KPB	KPB			KPB	KPB	KPB
KPB			K P	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB	K P	KPB	KPB	KPB	KPB
		P					
KPB	KPB	KPB	K P	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Reminder Service		
Set [1]	*81	81 + time
Operator Set[2]		81 + ext. no. + time[1]
Cancel	**81	*81
Operator Cancel[2]		*81 + ext. no.[2]
Missed[2]	*752	
Ringing/Idle Line Preference	*343	
On	*344	
Off		
Ringing Options		
Individual lines		
Immediate ring	*37	
Delay ring	*36	
No ring	*35	
All lines		
Immediate Ring	*347	
Delay Ring	*346	
No Ring	*345	
Abbreviated Ring		
On	*341	
Off	*342	
Send Ring (Shared SA)		
On	*15	
Off	**15	

1 English only: time is 12-hour (0100–1259 + 2(A) or 7(P). French and Spanish: time is 24-hour (0000–2359).
2 System operator feature only.

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB	KPB	KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
KPB	KPB	KPB		KPB	KPB	KPB	KPB
P	P	P	P	P	P	P	P

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Telephone and Operator Console Features—*Continued*

Feature	Program Code	Feature Code
Saved Number Dial	*85	
Send/Remove Message[1]	*38	38 + ext. no.
Service Observing[1,2]	*59 + ext. no.	
Signaling (manual)	*23 + ext. no.	
System Access buttons[3]		
Assign buttons		
SA (Default Ring)	*16	
SA Originate Only	*18	
Shared SA	*17 + primary ext. no.	
Change type (SA or Shared SA)		
Ring	**19	
Voice	*19	
System Speed Dial	*24 + code (600-729)	600-729
Transfer	*774	774
Voice Announce		
On	*10	
Off	**10	
VA on Idle Only (MLX telephones only)	*130	

1 System operator feature only.
2 MLX telephones only. Cannot be a QCC or CTI link.
3 Centralized telephone programming only.

MLX-5D, MLX-10D	MLX-16DP, MLX-28D	MLX-20L	Single-Line	MLX-5, MLX-10	Analog Multiline[1]	ETR	MLS
KPB	KPB	KPB		KPB	KPB	KPB	KPB
	KPB	KPB			KPB	KPB	KPB
KPB	KPB	KPB		KPB			
KPB	KPB	KPB		KPB	KPB	KPB	KPB
P	P	P		P	P	P	P
			P P P				
KPB	KPB	KPB	K P	KPB	KPB	KPB	KPB
B	B	B		B	B	KPB	KPB
KPB KPB KPB	KPB KPB KPB	KPB KPB KPB		KPB KPB KPB	KPB KPB	KPB KPB	KPB KPB

1 Includes the MDW 9000, MDC 9000, and MLC-5 telephones.

Reference Documents

Document Number	Title
System Documents	
555-670-100	*Customer Documentation Package*[1]
555-670-110	*Feature Reference*
555-670-111	*System Programming*
555-670-112	*System Planning*
555-670-113	*System Planning Forms*
555-670-116	*Pocket Reference*
555-670-119	*System Manager's Quick Reference*
555-661-150	*Network Reference*
555-670-800	*Customer Reference CD-ROM* [2]
Telephone User Support	
555-660-120	*Analog Multiline Telephones User's Guide*
555-660-122	*MLX Display Telephones User's Guide*
555-660-124	*MLX-5 and MLX-10 Nondisplay Telephones User's Guide*
555-660-126	*Single-Line Telephones User's Guide*
555-660-138	*MDC and MDW Telephones User's Guide*
555-630-150	*MLX-5D, MLX-10D and MLX-10DP Display Telephone Tray Cards (5 cards)*
555-630-151	*MLX-5 and MLX-10 Nondisplay Telephone Tray Cards (6 cards)*
555-630-152	*MLX-28D and MLX-20L Telephone Tray Cards (5 cards)*
555-630-155	*MLX-16DP Display Telephone Tray Cards (5 cards)*
555-670-122	*MLS/ETR Tray Cards*
System Operator Support	
555-660-132	*Analog Direct-Line Consoles Operator's Guide*
555-660-134	*MLX Direct-Line Consoles Operator's Guide*
555-660-136	*MLX Queued Call Console Operator's Guide*
Miscellaneous User Support	
555-661-130	*Calling Group Supervisor and Service Observer User Guide*
555-650-105	*Data and Video Reference*
Documentation for Qualified Technicians	
555-670-140ADD	*Installation, SPM, Maintenance and Troubleshooting Supplement*
Toll Fraud Security	
555-025-600	*BCS Products Security Handbook*

Within the continental United States, these documents can be ordered from the Lucent Technologies Customer Information Center by calling 1-800-457-1235 from within the continental United States, or 317-322-6791 from outside the United States.

1 The MERLIN LEGEND Customer Documentation Package consists of the paper versions of the *System Manager's Quick Reference*, the *Feature Reference*, and *System Programming*.

2 The Customer Reference CD-ROM contains the *System Manager's Quick Reference*, the *Feature Reference*, *System Programming*, and the *Network Reference*.

Maintenance Error Codes

Error Code	Description	Action
0001	TIMEOUT COLD START: System programming OK.	No action required; however, if problem persists, troubleshoot the processor.
0002	POWER UP WARM START: System programming OK.	No action required; however, if problem persists, troubleshoot the processor.
0003	SOFTWARE COLD START: System programming OK.	If problem persists, troubleshoot the processor.
0004	SOFTWARE WARM START: System programming OK.	If problem persists, troubleshoot the processor.
0005	Reset - DIAGNOSTIC SWITCH:	
0006	INCOMPLETE COLD START: System cold-started while restart in progress.	If problem persists, troubleshoot the processor.
0007	SANITY TIMEOUT RESET: Faulty software, module, carrier, or processor sanity timer.	Check module and/or processor.
0008	MAX RESET COUNT EXCEEDED: System cold-started because of too many warm starts.	If problem persists, troubleshoot the processor.
0009	FRIGID START: System restarted and initialized to defaults; also logged after System Erase.	If processor was removed while in use, system may perform frigid start because of loss of system programming. Restore system as described in *System Programming and Maintenance (SPM)*.
000A	POWER UP COLD START: RAM failure in processor; system programming OK.	If problem persists, check processor.
000B	CARD INSERTED/REMOVED:	None.
000C	SLOT STREAM CNT EXCEEDED: Slot generated excessive interrupts.	If problem persists, check module.
000D	FMWR NOT IN STANDBY MODE: Module firmware not in standby mode.	If problem persists, check module.
000E	COMMAND BUFFER FULL:	If problem persists, check processor and module.
000F	TASK RUNNING TOO LONG	None; if problem persists, check processor.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
0010	INVALID SLOT INTERRUPT: Cannot determine module responsible for interrupt.	Check modules and replace if necessary; if problem persists, check processor.
0011	STACK OVERFLOW: Processor problem.	Check processor.
0012	INVALID RESET FLAG: Processor problem.	Check processor.
0013	DUART STREAMING INT: Processor problem.	Check processor.
0014	PROCESSOR ERR INTERRUPT: Processor problem.	Check processor.
0015	MODULE MISMATCH: Module inserted into wrong slot.	Change system programming for proper module or install proper module.
0016	POWER UP COLD START: Module dual port ram failure; system programming OK.	If problem persists, check module for slot indicated.
0017	REAL TIME CLOCK FAULT: Date and/or time incorrect or unreadable.	If problem persists, replace processor module.
0018	RTC COLD START: This error is not displayed.	
0019	RESET TIME & DATE: System cold-starts because real-time clock chip is not working correctly.	If problem persists, replace processor module.
0401	ABK CARD NOT INSERTED: PCMCIA memory card for translation is not inserted.	Insert a translation card or an unformatted card.
0402	ABK INCORRECT CARD TYPE: PCMCIA memory card for non-translation is inserted.	Remove current card and insert a translation card or an unformatted card.
0403	ABK CARD WRITE-PROTECTED: Translation card has write-protected switch on.	Turn write-protection switch to off. If problem persists, try another card. If still not working, replace processor module.
0404	ABK EXTENSION BUSY: A station is in program, administration, or maintenance mode.	Wait until station changes mode.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
0405	ABK FAULTY CARD: Unknown cause of a bad card.	Reset card and retry. If problem persists, try another card. If still not working, replace processor module.
0801 and 1C07 and 5801	CTI LINK DELETED: A board renumber or slot restore moved the CTI link to an unacceptable port and the system has removed the link.	Check that the following are true: ■ The system is in Hybrid/PBX mode. ■ The link is on an 008 MLX or 408 MLX board. ■ The MLX board firmware vintage is not 29. ■ The extension is not an operator position. ■ An MLX telephone is not connected to that port. ■ Board renumber has not moved the MLX extension to the system programming port.
0C01	NO I-VMS PORT IN SERV: vms machine may be down.	None
0C02	DID INTERDIGIT TIMEOUT: Noisy line or central office problem.	None; if problem persists, check DID line and inform Central Office, if necessary.
0C03	ALL TTRs UNAVAILABLE: System needed to use a TTR, but one was not available for any and all reasons including: in use, not physically present, out of service.	Check count and first and last occurrences to determine if error occurs too frequently. If so, check to see if you can add TTRs to the system. If prompt out of queue is active, shorten the delay announcement message length. If prompt out of queue feature and secondary announcement(s) are active, increase the interval between the announcements. If you reprogram the delay announcement device, recheck it to verify that the problem no longer exists.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
0C04	MWL Fac Timeout: Two consecutive messages to update Message Waiting lights have been sent across the private network for the same tandem trunk and have not been acknowledged. When this happens three times, the error becomes permanent. The alarm remains in the log until a message is acknowledged or five days pass.	Check the error log for additional error codes. If the error log also contains errors indicating problems with the 100D and/or 400EM module, troubleshoot the 100D and/or the 400EM module (see Chapter 4 of *Maintenance and Troubleshooting).* If the 100D and/or the 400EM module are functioning properly, troubleshoot the trunks using instructions in Chapter 5 of *Maintenance and Troubleshooting.*
0C05	MWL Delivery Delay: A message to update the Message Waiting lights has exceeded the time period for delivery. A transient alarm occurs after one minute, and a permanent alarm occurs after 15 minutes. The alarm remains in the error log until a message is delivered or five days pass.	Check the error log for additional error codes. If the error log also contains errors indicating problems with the 100D and/or 400EM module, troubleshoot the 100D and/or the 400EM module using instructions in Chapter 4 of *Maintenance and Troubleshooting.* If the 100D and/or the 400EM module are functioning properly, troubleshoot the trunks using instructions in Chapter 5 of *Maintenance and Troubleshooting.* Check that the system receiving the message had enough TTRs to handle the volume of calls. Check the error log on the sending system and then on the receiving system. More facilities or TTRs may be needed.
1C01	POOL M-BUSY EXCEEDS 50%: more than half the trunks in pool are busy.	Check trunk.
1C02	DPR TEST NOT COMPLETED:	Slot did not complete initializing.
1C03	FW UPGRADE ATTEMPT:	No action required.
1C04	FW UPGRADE COMPLETE	No action required.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
1C05	INVALID FMW 29 DETECTED: Incompatibility problem; specified video endpoint or UDM is connected to an 008 or 408 MLX module with firmware of vintage 0x29.	Replace 008 or 408 MLX module with one of another firmware vintage. Retire permanent alarm manually.
1C06	BAD BOARDS IN SYSTEM: At least one incompatibility problem of type HER 0x1C05 detected. Turns on red LED on processor.	Replace 008 or 408 MLX module with one of another firmware vintage. Retire permanent alarm manually.
1C07	See error code 0801	
2C01	T1 ACCESS VIOLATION: T1 services (channels-voice/ data) programmed incorrectly.	Check facility provisioning and re-administer channels for voice or data. Ensure that T1 data facilities are accessed from data terminals only (such as UDMs or desktop video systems) and that T1 voice facilities are accessed from telephones only (such as MLX telephones).
2C02	Bearer Capability Incompatibility: A 64 kbps clear-channel data call was routed to a facility that does not have sufficient bandwidth to handle the call.	Verify that the ARS or UDP routing tables route a data call to a DS1 facility. Check the DS1 Type administration item for the specified facility. If the programmed value is T1, the caller must initiate a 56 kbps call. Check the DS1 Suppression administration item for the specified facility. If the programmed value is AMI-ZCS, the caller must initiate a 56 kbps call.
3001	ALARM TABLE FULL: error logs are full; turns on processor led.	Correct indicated errors, and then remove entries from the transient system error log. If problem persists, cold-start the system. SysProgram→System→ Restart
4401	USER REQUESTED SYS ERASE: Logged after System Erase. If System Erase is successful, this error is removed immediately.	If error remains in transient log, repeat System Erase. If problem persists, check processor.
4402	USER REQST UPGRD/INSTALL:	None.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
4C01	POOL EMPTY: System needed to use a trunk in a pool but no trunks were physically present in the pool—i.e., all of the boards were removed from the system.	Replace boards.
4C02	POOL BUSY: System needed to use a trunk in a pool. Trunks are physically present; however, none are idle and available for use—i.e., they may be in use or out of service.	
4C03	POOL BUSY &/OR OOS: System needed to use a trunk in a pool. Trunks are physically present; some may be busy but some are idle. However, the idle trunks are not in service.	Restore if out of service.
5801	See error code 0801	
5802	Board Renumber Board renumber took place.	If the system is functioning properly, simply remove the error from the Transient Error Log. If the system is not functioning properly, check the Transient Error Log to verify that a board renumber took place. Then compare the system's previous configuration to the one after board renumbering to determine if the board renumber caused logical IDs to shift.
6C01	DS1 LOSS OF SIGNAL ALARM: Service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.
6C02	DS1 BLUE ALARM: All 1s being received; service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.
6C03	DS1 RED ALARM: Invalid framing information on incoming signal; service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.
6C04	DS1 YELLOW ALARM: Far end of network interface has lost frame synchronization; service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.
6C05	DS1 LOSS OF MULTIFRAME: Service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
6C06	DS1 REMOTE MULTIFRAME: Far end of network interface is experiencing loss of multiframe; service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III.
6C07	DS1 MAJOR ALARM: Average bit error rate exceeds 10E-3; service on link has been lost.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III. Maintenance→Slot→ Error Events→ Current hr
6C08	DS1 MINOR ALARM: Average bit error rate exceeds 10E-6.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III. Maintenance→Slot→ Error Events→ Current hr
6C09	DS1 MISFRAME ALARM: Misframe count reached 18.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III. Maintenance→Slot→ Error Events→ Current hr
6C0A	DS1 SLIP ALARM: Slip count reached 88.	Usually no action. Check T1 facility. If problem persists, contact NSAC Tier III. Maintenance→Slot→ Error Events→ Current hr
6C0B	HARDWARE INOPERATIVE: Hardware not operating properly. If this is the only 100D module or 800 NI-BRI module, or if this is the designated clock module, its tdm bus clock generator was not activated.	A Busy-Out/Restore or Reset/ Restore may clear problem. If problem persists, contact NSAC Tier III.
6C0C	BRI LOSS OF SYNC: Service on link has been lost.	Usually none; check BRI facility. If problem persists, contact NSAC Tier III.
6C0D	BRI SLIPS > 88: Slip count > 88. Service on link is still operative.	Usually none; check BRI facility. If problem persists, contact NSAC Tier III.
6C0E	BRI NET REQUESTED CCRCs: Outgoing signal to the network does not have valid framing information. Service on link is still operative.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
6C0F	BRI NET DEACTIVATE: Layer 1 of the link is down. Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
6C10	BRI NET INV 2B+D LB ACT: Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
6C11	BRI NET INV B1 LB ACT: Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
6C12	BRI NET INV B2 LB ACT: Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
6C13	BRI NET INV IL LB ACT: Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
6C14	BRI NET INV QM LB ACT: Service on link has been lost.	Usually none; link should return to normal once test is completed. If problem persists, contact NSAC Tier III.
7001	PRI SVC AUDIT TIMEOUT:	Check PRI facility and report to service provider; otherwise, no action is needed. If problem persists, contact NSAC Tier III.
7002	PRI SVC STATE INCONSIST:	Check PRI facility and report to service provider; otherwise, no action is needed. If problem persists, contact NSAC Tier III.
7003	PRI D-CHNL INOPERATIVE:	Check PRI facility and report to service provider; otherwise, no action is needed. If problem persists, contact NSAC Tier III.
7004	PRI B-CHNL NOT RELEASED:	Check PRI facility and report to service provider; otherwise, no action is needed. If problem persists, contact NSAC Tier III.
7005	PRI B-CH GROUP INCONSIST:	Check PRI facility and report to service provider; otherwise, no action is needed. If problem persists, contact NSAC Tier III.
7006	PRI PROTOCOL MISMATCH: A mismatch in the protocol being supplied versus the protocol expected by MERLIN LEGEND.	Inform the service provider to change the administration for this circuit. After the service provider restarts the circuit, verify that all alarms for this slot are cleared.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
7401	TRK UPLINK MESSAGE ERROR: Communication problems between processor and modules; unrecognized message from module to processor.	Test trunk with single-line telephone. If problem is not in trunk, replace module with one known to work. If problem is not seen with known working module, replace module and restart.
7402	LOOP CONTROL BIT NOT SET: No loop current on outgoing call. If error occurs four times consecutively, and if automatic maintenance-busy is enabled with less than 50% maintenance busy, trunk is busied-out automatically.	Test trunk with single-line telephone. If problem is not in trunk, replace module with one known to work. If problem is not seen with known working module, replace module and restart.
7403	NO LOOP CURRENT: Communication problems between module and CO. No loop current. If error occurs four times consecutively, and if automatic maintenance-busy is enabled with less than 50% maintenance busy, trunk is busied-out automatically.	Test trunk with single-line telephone. If problem is not in trunk, replace module with one known to work. If problem is not seen with known working module, replace module and restart.
7404	STUCK RINGING: Communication problems between module and CO. If error occurs two times consecutively, trunk is busied-out automatically whether or not automatic maintenance-busy is enabled.	Test trunk with single-line telephone. If problem is not in trunk, replace module with one known to work. If problem is not seen with known working module, replace module and restart.
7801	NOT IN NORMAL OP MODE: Module not in normal operation mode; reported in background module check.	Reset board. If problem persists, check module. `Maintenance→Slot→ Slot Number→Reset`
7802	SANITY INT NOT GENERATED: Applies only to modules with extension jacks.	Reset board. If problem persists, check module.
7803	NO PORT BOARDS AVAILABLE: Modules not present.	None; delete entry from transient log.
7804	INVALID SANITY RESPONSE: Sanity test received invalid responses; applies only to modules with extension jacks.	Reset board. If problem persists, check module.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
7805	INVALID SLOT NUMBER: Rare; software could not process an event detection because slot number was invalid.	None; if problem persists, restart system.
7806	NOT IN STANDBY MODE: Reported during cold start or background check.	Reset board. If problem persists, check module.
7807	SELF TEST NOT COMPLETED: Reported during cold start.	Reset board. If problem persists, check module.
7808	TEST RESULT REGISTER BAD: A module or processor error during test run.	Reset board. If problem persists, check module.
7809	TEST STATUS REGISTER BAD: A module or processor error during test run.	Reset board. If problem persists, check module.
780A	DPR TEST NOT COMPLETED: Reported during cold start.	If problem persists, check module.
780C	RAM TEST FAILURE: Memory failed ram test; turns on processor led.	If problem persists, replace processor.
780D	UPPER ROM FAILURE: Memory failed rom test; turns on processor led.	If problem persists, replace processor.
780E	LOWER ROM FAILURE: Memory failed rom test; turns on processor LED.	If problem persists, replace processor.
8001	UNEXPECTED ETR MESSAGE Indicates one of the following: ■ An unsupported ETR telephone was connected. ■ An ETR/MLS telephone is faulty. ■ An ETR board is faulty. ■ The software is showing the message in error.	If a single user is complaining about an ETR/MLS telephone not working properly, check to be sure the telephone is a supported model. If the ETR/MLS telephone is supported, replace the faulty telephone. If multiple ETR/MLS telephone users connected to the same ETR module are complaining that the telephones are not working properly, troubleshoot the module and replace it if necessary. If no users are complaining, simply clear the error.
8401	MISCELLANEOUS ERROR: Not reported.	None.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
8402	WINK TOO SHORT: Outbound dialing problems on tie trunks. Wink from the far end of network interface is less than 100 ms, the minimum for delay-dial or wink-start tie trunks. Tie trunk waits for valid signal.	Check far end of network. Check for faulty cable. Replace module.
8403	NO EXTERNAL RELEASE: Communication problems between module and CO. Far end has not disconnected within 4 minutes. If error occurs twice consecutively, trunk is busied-out automatically whether or not automatic maintenance-busy is enabled.	Check far end of network interface. Check for faulty cable.
8404	ON HOOK BEFORE WINK: Outbound dialing problems on tie trunks. Far end of network interface went on-hook before handshake was completed (for delay-dial or wink-start tie trunk).	If problem persists, check tie trunk configuration. Check far end. Check for faulty cable. Replace module.
8405	ON HOOK BEFORE READY: Outbound dialing problems on tie trunks. Far end of network interface went on-hook before guard time elapsed (for delay-dial or wink-start tie trunk).	Check far end of network interface. Check wink start and for faulty cable. Check far end of network. Replace module.
8406	INTERDIGIT TOO SHORT: Inbound dialing problems on tie and DID trunks.	Check far end of network interface. Check for faulty cable. Replace module.
8407	BAD UPDATE: Communication problems between processor and modules; module may need to be replaced.	Turn processor off and then on. Repeat system programming procedure. If problem persists, contact NSAC Tier III.
8408	ROTARY RATE > 12PPS: Inbound dialing problems on tie and did trunks.	Check far end of network interface. Check for faulty cable. Replace module.
8409	ROTARY RATE < 8PPS: Inbound dialing problems on tie and did trunks.	Check far end of network interface. Check for faulty cable. Replace module.
840A	BAD DOWNLINK MESSAGE: Communication problems between processor and modules; module received an unrecognized message from processor.	Turn processor off and then on. Repeat system programming procedure. If problem persists, replace module.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
840B	NO LOOP CURRENT: Communication problems between module and CO; no loop current. If error occurs four times consecutively and if automatic maintenance-busy is enabled and maintenance-busy limit is less than 50%, trunk is busied-out automatically.	Replace module with similar module and test. If problem is resolved, replace bad module. If problem persists, reinstall old module and test trunk.
840C	STUCK RINGING: Communication problems between module and CO; no loop current. If error occurs four times consecutively and if automatic maintenance-busy is enabled and maintenance-busy limit is less than 50%, trunk is busied-out automatically.	Replace module with similar module and test. If problem is resolved, replace bad module. If problem persists, reinstall old module and test trunk.
840D	INCORRECT FIRMWARE STATE: If error occurs four times consecutively and if automatic maintenance-busy is enabled and maintenance-busy limit is less than 50%, trunk is busied-out automatically.	Turn power off for at least one second, and then turn it on. Repeat system programming procedure. If problem persists, replace module.
840E	UPLINK MESSAGE ERROR: Communication problems between processor and modules. Module received unrecognized message from processor.	Turn processor off and then on. Repeat system programming procedure. If problem persists, replace module.
840F	LOST IDLE MESSAGE ERROR: Loop start trunk lost an idle message during glare timing.	System has taken corrective action. If problem persists, contact NSAC Tier III.
8C01	SLOTS NOT EQUAL: Module that occupies indicated slot does not match slot information contained in PC or PCMCIA card backup file.	Check slot descriptions in backup file against actual system modules that occupy slots. After mismatch is corrected, restore.
9801	MCARD WRITE ERROR: Write to memory card is unsuccessful or too slow.	Reset card and try again. If problem persists, replace card and try again. If problem continues, replace processor module.
9802	MCARD ERASE ERROR: Erasure of memory card is unsuccessful or too slow.	Reset card and try again. If problem persists, replace card and try again. If problem continues, replace processor module.

Maintenance Error Codes—*Continued*

Error Code	Description	Action
9803	MCARD 12-VOLT ERROR: Memory card voltage is incorrect.	Reset card and try again. If problem persists, replace card and try again. If problem continues, replace processor module.
9C01	NW REJECTS SPID: Service on link has been lost.	Check programmed line. Modify if required, or call Cental Office to correct.
9C03	LINK ESTABLISHMENT FAIL: Service on link has been lost.	Check that line is securely connected to port and that LEDs on module show proper operation. If card appears to work properly, line may not have been activated by Central Office.
9C04	NW NOT RESPOND TO SETUP: Service on link has been lost.	Network not responding to LEGEND messages. Contact Central Office.
9C05	NW NOT RESPOND TO RELEASE: Service on link has been lost.	Network not responding to LEGEND messages. Contact Central Office.
9C07	ENDPOINT UNINIT (L2/L3): Service on link is uninitialized.	If this lasts more than three minutes, replug the DSL. If the error remains, contact Central Office.
9C08	PROTOCOL ERROR: Service on link may be affected.	Verify line provisioning. If correct, contact NSAC Tier III.
A401	CTI LINK BROADCAST RESET: Occurs during a broadcast reset.	If several of these occur: ■ Check that the system is in Hybrid/PBX mode. ■ Validate the wiring and the connections. ■ Press the Restart Button (see the procedure “Restart” in Chapter 4 of *Maintenance and Troubleshooting*). ■ Call the TSO’s Telephony Services Maintenance Group (800 242-2121) for procedures to unload and reload the PBX driver.

Technical Addendum

Maintenance Error Codes—*Continued*

Error Code	Description	Action
A801	CTI LINK HIDDEN RESET: Occurs during a hidden reset.	If several of these occur, and the client application has "slow" response time: ■ Validate the wiring and the connections. ■ Press the Restart Button (see the procedure "Restart" in Chapter 4 of *Maintenance and Troubleshooting*). ■ Call the TSO's Telephony Services Maintenance Group (800 242-2121) for procedures to unload and reload the PBX driver.

NOTES

Technical Addendum

Module/Component History

Module/ Component	PEC	Comcode	Apparatus Code
Backplane			
Basic		106388614	403E
		107007114	403G
Expansion	61490	106388630	403F
	61450	107007122	403H
Power Supply			
120 V		105743801	391A1
		106257199	391A2
		107184848	391A3
100 – 240 V		107793275	391C1
220 V		106678931	391B1
		107184855	391B2
Auxiliary	61416	406467142	90240-3
Processor			
R1.0/2.0		106215155	517A27
Secure		107096869	517A27-F
Hong Kong		107221434	517A27(16)
Czech		107628133	517A27(34)

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
All			Used in control units 6140-CU1, 6140-CU2, 6140-CU3, 6140-INT, 6140-220, 6140-CUL, 6140-P3C, 6140-P3D, 6140-P3E, 6140-P4D, 6140-P4F and 6140-SEC
All			Used in control units 6140-C61, 6140-U61A, 6140-61C, 6140-61D, 6140-61F, 6140-61G, 6140-61I, 6140-61J, 6140-P3E, and 6140-CU3
All non-US			Used in control unit 6140-220 and in expansion units 61450 and 61497
All US			No longer available
1.0, 2.0, 1.1, 2.1, 1.2i, 1.3i, 1.4i	00		Used in control units 6140-CU2, 6140-INT, 6140-INT, and 6140-220
2.0, 2.1	05		For Federal Systems; used in control unit 6140-SEC
1.2i, 1.3i, 1.4i	01		For Hong Kong
1.2i, 1.3i, 1.4i			For Czech Republic

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Module/Component History—*Continued*

Module/ Component	PEC	Comcode	Apparatus Code
Processor (cont'd)			
R3.0		107040438	517A33
		107438921	517B33
R3.1		107752693	517D33
R4.0		107743403	517C33
R6.0		108282765	517M33A
R6.1		108282765	517M33A
R7.0		108330531	517N33A
Feature Module			
R1.0		106064660	517A25
		106656739	517B25
		106729031	517C25
		106767767	517C25B
		106743008	517D25
		106743016	517E25

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
3.0	01		ML R3.0 or later; no FM used; used in control units 6140-CU3, 6140-P3C, 6140-P3D, 6140-P3E, 6141-U3LA, 6141-103A
	02		ML R3.0 or later; no FM used; higher temperature reliability; no watch point registers; used in control units 6140-CU3, 6140-P3C, 6140-P3D, 6140-P3E, 6141-U3LA, 6141-103A
3.1	02		Used in control units 6140-C31, 6140-P31C, 6140-P31D, 6140-P31E, 6141-U3LA, 6141-103A
4.0	02		Used in control units 6140-CU3, 6140-P3C, 6140-P3D, 6140-P3E, 6141-U3LA, 6141-103A
6.0			Used in control units 6140-CU6, 6140-P6C, 6140-P6D,6140-P6F, 6140-P6G, 6140-P6I, 6140-P6J, 6141-115A, 6141-116A
6.1			Used in control units 6140-C61, 6140-61C, 6140-61D, 6140-61F, 6140-61G, 6140-61I, 6140-61J, 6141-U61A, 6141-UGLA
7			Used in control unit 6140-CU7
1.0			GA version
1.0		SW[1] = 1.0 V14.7	See QPPCN 244 MT.
1.0		SW = 1.0 V14.9	See QPPCNs 244MTS1 and 251MT.
1.0		SW = 1.0 VEAL (14.10)	See QPPCN 254MT.
1.1			GA version
1.1		SW = 1.1 V5.2	See QPPCN 260MT.

1 SW = software.

Technical Addendum

Module/Component History—*Continued*

Module/ Component	PEC	Comcode	Apparatus Code
Feature Module (cont'd)			
R1.1		106825888	517F25
		106999873	517F25B
		106999899	517F25C
R2.0		106874738	517G25
		106874746	517H25
R2.1		106874753	517J25
		107526352	517J25B
NI-BRI (R2.B)		106999824	517K25
		107499170	517K25B
R1.2i		106796949	517A30
R1.3i		106875750	517B30(28)
		106875768	517C30
R1.4i		107252728	517D30
PCMCIA Card			
Backup/Restore	61501	107245243	10A1
R3.0 SW Upgrade		107245250	10B1
R3.0 Forced Install		107245268 107655201	10C1 10C2
R3.1 SW Upgrade		107752743	10B2
R3.1 Forced Install		107752677	10C3
R4.0 SW Upgrade	61506	107741274	10D1
R4.0 Forced Install		107741241	10E1
R6.0V11 Forced Install		108261652	10G2
R6.1 Forced Install		108282484	10H1
R7 Forced Install		108387929	10J1

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
1.1		SW = 1.1 V5.3	See QPPCN 266MT.
1.1		SW = 1.1 V7.3	See QPPCN 292MT.
1.1		SW = 1.1 V7.7	See QPPCN 308MT.
2.0		SW = 2.0 V8.2	See QPPCN 279MT.
2.0		SW = 2.0 V8.3	See QPPCN 290MT.
2.1		SW = 4.0	See QPPCN 307MT.
2.1		SW = 4.9	See QPPCN 406MT
NI-BRI (2.B)		SW = 9.2	Pre-GA
NI-BRI (2.B)		SW = 9.6	GA version
1.2i			
1.3i			
1.3i		SW = 8.0	GA version
1.4i			Included in 6141-INT and 6141-220
3.0 and later			Translation card for R3; also included as part of processor PEC
3.0			Contains R3V10.3
3.0			R3V10.0 R3V10.3
3.1			Contains R3.1V2.0
3.1			Contains R3.1V2.0
4.0			Contains R4.0V9.0
4.0			Contains R4.0V9.0
6.0			Contains R6.0V11
6.1			Contains R6.1
7.0			

Technical Addendum

Module/Component History—*Continued*

Module/ Component	PEC	Comcode	Apparatus Code
008 ATL	61385	103983508	517A3
	61485	105351092	517B3
008 MLX	61486	105628010	517A21
		107798183	517B21
		108333717	517C21
008 OPT			
Without Ring Generator		106387525	517A28
		106933187	517B28
	61489		
		106980162	517C28
		107009821	517C28B
With Ring Generator		106995269	517D28
	61479		
		107321192	517D28A
		107731994	517E28
012 T/R			
Without Ring Generator		105249023	517A13
		105461545	517B13
	61387 or 61487	105512412	517C13
		106397631	517D13
		106553779	517E13
		106767379	517F13
With Ring Generator		106933773	517G13
	61494 or 61459	107108698	517G13(28)
		107438939	517H13
Ring Generator	61388	105213201	129B
	61498	106741788	129C

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
All	0.1	0.B	
	0.1	0.B	Reduced package; no telephone user's guide
	0.4	1.1	
	0.4	1.3	
	05		
All	02	11	
	03	12	Fixes ring patterns and ring trip
	03	14	Eliminates flash during hang-up
	03	15	Eliminates flash during answer
All	04	16	Built-in ring generator
	05	16	
	05	17	
	05	18	Enhances ringing on long loops
All	01		REN >5
	01		Enhanced battery feed protection
	01	08	Forward disconnect added; need for Voice Mail
	01	08	Improve performance of inductive ringers
	01	08	Meets EIA transmission standards for use with MEGACOM® services
	01	70	
All	02	32	Built-in ring generator; REN <+1
	03	33	REN increased to 2.4
	04	34	REN increased to = 4.0
All			Required for 517A13—517F13

Technical Addendum

Module/Component History—*Continued*

Module/ Component	PEC	Comcode	Apparatus Code
016 T/R	61507	107824948 108333691	517B34 517D34
016 ETR	61512A	108359571	517A56
016 MLX	61511A	108333659	517A54
100D (DS1)/T-1	61491	107538887 105461560 105512438 108044769	517A15 517B15 517C15 517E15 517M15
400 EM TIE	61492 8303-200	105311401 108314261	517A14 517D14
400 (w/TTRs)	61379	105408892	517B12
400 GS/LS/TTR	61483	105627988 105628044 107044869	517A18 517B18 517C18
400 LS	61384	103983490 105351084	517A2 517B2
400 LS/TTR Int'l (DTD)	61452	106819238 107732018	517B12(28) 517C12(28)
408 GS/LS/ATL	61481	106064678 106939366 107044877	517A26 517B26 517C26
408 GS/LS MLX	61493	106698590 107044851	517A29 517B29
408 GS/LS-ID-MLX	61505	108333733	517E29
408 LS/ATL	61482	103983482 105351076 105512495	517A1 517B1 517C1
800 NI-BRI	61503	107025793	517A32
800 NI-BRI	61510	107731127 108318494	517A35 517B35

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
4.0, 1.4i			App Vintage 04 R4.0 and later
7			
7			
All			Tie trunk only LS, GS, DID, and PRI emulation added Meets BC interoperability specs Improved EMI performance
All			
All	01	0.B	Lightning protection added; starting in 1996, replaced by 517C12(28)
All U.S.	03	1.1	
	03	1.2	Sleeping TTR fix
	03	1.3	Phantom ringback fix
			No lightning protection; 146 protector required Lightning protection added
1.2i, 1.3i, 1.4i			Includes LG80 crosstalk fix
All U.S.	04	11	
	04	12	Reduces clicking on third carrier
	04	13	Phantom ringback fix
All US 2.0 or later			App Vintage 24 28 Cost-reduced version; current production 29 Withdrawn from production
7.0 and later			App Vintage 27, R7.0 and later
All	01	0.B	No lightning protection; 146A protector required
	01	0.B	Protection added
	01	0.B	Reduced packing; no telephone user's guide
NI-BRI (2.B)	00	70	Supports 5ESS® Custom
4.0			Supports ISDN 1 standard

Technical Addendum

Module/Component History—*Continued*

Module/ Component	PEC	Comcode	Apparatus Code
800 DID	61488	105628002	517A20
		105628077	517B20
		106936644	517C20
		106995251	517D20
		108318478	517G20
800 GS/LS	61484A	105627996	517A19
		105628069	517B19
800 GS/LS ICLID	61502	106975584	517A31
		108357609	517B31
800 LS	61384	103983516	517A4
		105351100	517B4
800 LS Int'l	61451	106819220	517B4(28)
800 LS Int'l (DTD/PPM)	61458	107074726	517C4(28)
		107252736	517D4(28)
E1			
75 Ohm	61454	106825896	517C15(28)
			517E15(28)
120 Ohm	61457	107100133	517D15(28)
		107533861	517F15(28)
MFC 6-Channel	61456	106825904	517C16(28)

Technical Addendum

Release Used In	HW Vint	FW Vint	Notes
All	01	11	
	02	01	Fixes DID call misrouting
	03	12	Eliminates false error messages
	04	17	Cost-reduced version
All US	03	1.1	App Vintage 13. R3.0 and later
	03	1.2	Phantom ringback fix
3.0 or later			
All	0.1	0.B	No lightning protection; 146A protection required
	0.1	0.B	Introduces dual solid-state relays on lower board
1.2i, 1.3i	0.2	0.CD	
1.3i, 1.4i	02	E4	
			PFT polarity fix
1.3i, 1.4i			
			EMI improvement
1.3i, 1.4i			
			EMI improvement
1.3i, 1.4i			

Technical Addendum

Telephone LEDs

MLX-20L Console

System Programming Menu Option	Option	LED Status Green LED ON	Green LED OFF	Red LED ON	Red LED OFF
Lines Trunks	Tie Lines				
	Inmode	Incoming tie line is touch-tone	Incoming tie line is rotary dial[1]		
	Outmode	Outgoing tie line is touch-tone	Outgoing tie line is rotary dial[1]		
	Dialtone	Remote dial tone[1]	Local dial tone		
Lines Trunks	TT/LS Disc				
	Outmode	Line/trunk is touch-tone[1]	Line/trunk is rotary dial		
Lines Trunks	Pools			Trunk is in pool	Trunk is not in pool
Lines Trunks	Toll Type	Must dial 1 + area code[1]	1 + dialing is not needed		
Lines Trunks	Hold Disconc	Long—450 ms[1]	Short—50 ms		
Lines Trunks	LS-ID Delay	LS-ID Delay is on	LS-ID Delay is off[1]		
Extensions	Lines Trunks	Line/trunk or pool is assigned to button	Line/trunk or pool is not assigned to button	Trunk is assigned to a pool	

1 Factory setting

Telephone LEDs—*Continued*

DSS Console

System Programming Menu		Red LED Status		
Option	**Option**	**ON**	**OFF**	**FLASHING**
Extensions	Account (FACE)	Forced Account Code Entry assigned	Forced Account Code Entry not assigned[1]	
Extensions	BIS/HFAI	Telephone has BIS/HFAI capability (factory setting for analog multiline telephone)		
Extensions	Call Pickup	Telephone is assigned to Call Pickup Group	Telephone is not assigned to Call Pickup Group[1]	
Extensions	VoiceSignl	Voice Announce to busy assigned	Voice Announce to Busy not assigned[1]	
Extensions	Ext status	Extension Status assigned	Extension Status not assigned	Extension Status can be assigned
Extensions	Group Page	Telephone is in group	Telephone is not in group[1]	
Extensions	Group Cover	Telephone is in coverage group	Telephone is not in coverage group[1]	
Extensions	Group Calling Members	Telephone is assigned to group	Telephone is not assigned to group[1]	
Extensions	Mic Disable	Telephone microphone is disabled	Telephone microphone is enabled	
Extensions	Remote Frwd	Telephone can transfer calls to a remote telephone number	Telephone cannot transfer calls to a remote telephone number[1]	
Night Service	Group Assign	Telephone is in group	Telephone is not in group[1]	

1 Factory setting

Technical Addendum

Telephone LEDs—*Continued*

DSS Console—*Continued*

System Programming Menu Option	Option	Red LED Status ON	OFF	FLASHING
Night Service	Exclude List	Telephone is excluded	Telephone is not excluded[1]	
Aux Equip	Msg Waiting	Station is a fax message-waiting station	Station is not a fax message-waiting station	
Aux Equip	Fax Extension	Extension is a fax machine	Extension is not a fax machine	
Tables	AllowTo	Allowed List assigned to telephone	Allowed List is not assigned to telephone[1]	
Tables	DisallowTo	Disallowed list assigned to telephone	Disallowed list is not assigned to telephone[1]	
Data	Voice/Data	Voice/data pair	Not voice/data pair[1]	
Operator	Direct Trunk Queued Call	Operator position	Other	Can be assigned as operator position
Operator	Queued Call Message Center	Message Center position	Other	Can be assigned as Message Center
Operator	In Queue Alert	Position receives In-Queue alert	Other	Position can receive In-Queue alert
	Call Types—Dial 0, LDN Unassigned, DID, Grp Coverage	Position receives call type	Other	Position can receive call type

1 Factory setting

Technical Addendum

Wiring Constraints

System Wiring

- System within 5 feet of dedicated AC power outlet.
- System within 25 feet of the network interface.
- Telephones within 1000 cable feet (304.8 m) of all telephones except MLX telephones. MLX telephones within 3000 feet of control unit. IROBs if needed.
- Ground wire for the power supply cannot be over 10 feet.
- If the SMDR printer is over 50 feet from the control unit, use an Asynchronous Data unit (ADU).
- Back-to-back connection of the DS1 facility with another system's facility is possible when the cable distance is less than 1300 feet.
- Telephone Wiring.
- Maximum cord length from an MLX telephone to a ISDN data module is 80 feet (24 m).
- Total length of cords between the KS22911-L2 or 406743419 power supply and the MLX telephone cannot be more than 50 feet.
- Do not replace the 2-foot. D8AC cord (packaged with the DSS) with a longer cord.
- Radio base of the MDW 9000 cordless telephone must be at least 25 feet from the control unit.

PC Connections

To use the DOS SPM or WinSPM software, you must install the software using the directions packaged with the software. Also, your PC must be connected to the MERLIN LEGEND System directly via a serial port on your PC, or you must connect to the MERLIN LEGEND internal modem using your PC's modem:

- **Direct Connection.** A serial port on your PC is connected directly to the MERLIN LEGEND System programming jack—the lower modular RS-232 jack on the processor module.
- **Internal Connection**. You are using a modem (either connected to or built into your PC) that is connected to the MERLIN LEGEND System (for example, via an 012 T/R or 016 T/R module) to access the MERLIN LEGEND internal modem.
- **External Connection**. You are using a modem (either connected to or built into your PC) and using a dial-up connection to access the MERLIN LEGEND internal modem. The External Connection type requires use of the Remote Access feature to allow you to connect to the MERLIN LEGEND programming port without human intervention.
- **Manual Connection**. You are using a modem (either connected to or built into your PC) and using a dial-up connection to access the MERLIN LEGEND internal modem. The Manual Connection is used when you must reach MERLIN LEGEND programming port by placing a call to the site and the person that answers transfers your call to the programming port.

Technical Addendum

NOTE:
If you are using WinSPM, follow the instructions packaged with the software.

Direct Local Connection

Follow these steps to access SPM when you are directly connected to the system via the administration jack on the processor module:

1. Set up the physical connection between your laptop or PC and the control unit.
2. Start SPM and press any key to display the SPM Main Menu.

Local Modem Connection

Follow these steps to access SPM when you are connected onsite via a modem:

1. Set up the physical connections between the PC and a tip/ring port on a control unit module.
2. Type `spm` and press Enter or double-click the icon to display the SPM Welcome screen.
3. Press Enter to display a blank screen on which you can enter modem commands. (You may have to press Enter several times.)
4. Dial the commands required by your modem and dial `*10`.
5. Type the SPM password to display the SPM Main Menu.

Remote Modem Connection

Follow these steps to access SPM when you connected offsite via a modem:

1. Type `spm` and press Enter to display the SPM Welcome screen.
2. Press Enter to display a blank screen on which you can enter modem commands. (You may have to press Enter several times.)
3. If your system has activated the Remote Access feature, type the following:
   a. The dial command required by your modem.
   b. Remote access telephone number.
   c. Barrier code (if existing) preceded by a "W."
   d. `W*10` (`*10` is the extension for the programming port).
4. If your system does not have the Remote Access feature activated, do the following:
   a. Place a voice call to the system on the line to which the modem is connected by using the main telephone number.
   b. Have the operator transfer you to the modem (by pressing Transfer, dialing `*10`, and hanging up the telephone).
   c. To put the modem online by typing the command required by your modem.
   d. Press Enter, and hang up the telephone.
5. Type the SPM password to display the SPM Main Menu.

Technical Addendum

When Calling NSAC

Do the following before you call Tier III for troubleshooting:

1. Check and recreate the problem.
2. Connect your laptop or PC so you are ready.
3. Know the software version of your system (Dial *05 on an ETR or MLX display telephone ICOM or SA button).
4. Write down the errors in the Error Logs.
5. Know the configuration of the system operator console (DLC or QCC).
6. Know the type of tie lines (emulated or not, wink-start, etc.).

QPPCNs on the NSAC Bulletin Board

Follow these steps to review QPPCNs on the NSAC bulletin board:

1. Dial 800-241-3375.
2. At the first screen, select F for File Section.
3. At the next screen, select N for Non-Tier III Tips.
4. At the next screen, select 8 for QPPCNs.

QPPCNs Online

QPPCNs are available online at:

http://www.bcs.com/tech_info/qppcn

Technical Addendum

Technical Support Telephone Numbers

Product or Service	Comments	Telephone Number
Lucent Technologies Equipment		
NSAC Tech Support	PARTNER, MERLIN, VINTAGE, CLASSIC	800-552-3293
TSC Tech Support	DEFINITY	800-248-1234
Network Systems (RTAC)	DACS, SLC, ESS, DDM	800-225-7822
Network Systems	ISDN Sets (6500/7500)	800-225-4672
Network Engineering Group	MERLIN LEGEND private networking	888-297-4700
AT&T Paradyne	CSU, DSU, MUX, Hubs, Routers	800-237-0016
Long Distance		
Over Local Lines/Trunks		
AT&T		800-222-3000
MCI		800-444-2222
SPRINT		800-877-4646
T1 Service		
AT&T	800/MEGACOM/ISDN	800-222-1000
AT&T	Data	800-325-1230
MCI		800-444-8722
SPRINT		800-877-5045 or 6277
To identify your long distance carrier		700-555-4141
To identify the telephone # from which you are calling		10732-1-404-988-9664
Other GBCS Support		
NSAC QPPCN Coordinator	Small Business Products	303-843-5204
TSC QPPCN Coordinator	Large Business Products	800-248-1234
BCS Publications Center	Documentation on all BCS products	800-457-1235
NSAC Bulletin Board	On-line technical/product information	800-241-3375
TIER III TIPS publication	Sue Williams Publication Manager	303-843-5921
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MERLIN LEGEND Communications System Release 7.0
Pocket Reference
Issue 1, April 1999
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