Meridian 1

Meridian Companion

Installation and Maintenance Guide

Document Number: 553-3601-200
Document Release: Standard 7.00
Date: November 1998

Contents

Introduction to Meridian Companion 1

Preparing to install a Meridian Companion system.....1

Installing a Meridian Companion system 2

Installation warnings 4

Safety precautions 6

System overview.....10

Installing the hardware 11

Installing Base Stations.....12

Installation guidelines..... 12
Powering a Base Station 13
Mounting a Base Station 14
Installing remote power interconnect units..... 17
Mounting the remote power interconnect unit 25
Wiring the RPI unit 27
Upgrading an RPI-8 to an RPI-16 32
Mounting a Base Station plug-top power supply..... 33

Installing external antennas and lightning surge arrestors.....36

Planning for an outdoor external antenna 38
Installing an outdoor external antenna 38

Installing a lightning surge arrestor 40

Installing a Companion Administration Terminal 41

Installing the Administration Terminal 41
Mounting an Administration Terminal on the wall 42

Installing Companion Manager 42

Installing the PC Interface Card 42

Setting the base address dip switches 43
Installing the PCI card 45
Setting the hardware interrupt 45

Installing a Remote Access Device 46

RAD configuration options 47

Wiring the Time Compression Multiplexing lines 50

Planning the IPE and CE/PE Module wiring 50

Installing Meridian Companion cards 58

Normal LED behavior upon installation 59
Placing the cards 61
Installing the cards 65

System initialization 69

Verifying initialization 69

Are arrow indicators flashing? 69
Do you see System coldstart? 69
Did you install more Base Stations? 69
Does the display show any of these messages? 70

Memory Reset 70

Programming the Meridian Companion system 73

The Meridian Companion Programming and Provisioning Record 74
The Administration Terminal 74
Buttons 74

Operating the Administration Terminal 76
Adjusting the contrast 76
Entering a Configuration programming session 76
Entering an Administration session 76
Ending a programming session 77

Recording and reporting alarm messages 77

Verifying card status 78

Verifying Base Station status 78

Programming telephony data 79
Dial delay 79
B03 gain value modification 80
Portable telephone side tone 81
CMCC slot 82
WTN 83

Programming mobility data 83
Setting the antenna type for a radio 84
Setting the System Access Logical Identifier 85

Programming the system time and date 87
Programming the system time 87
Programming the system date 88

Changing passwords 88
Changing the Installer password 88
Changing the Administration password 90
Changing the Registration password 91

Activating wireless communications 93

Codes and credits 93
Portable Credit Code 93
UTAM Activation Code 93

Accessing the Nortel IVR system 94
Companion ID 94
System Security Number 94
Activating a new system 96
Verifying a Meridian Companion installation 99
Viewing radio and cell assignments 101
Identifying a radio's cell assignment 102
Configuring the Meridian 1 for the Meridian Companion system 103
X11 release 15 or greater without package 240 104
X11 release 20B or greater with package 240 105
Wireless telephone privacy 107
Programming options 107
X11 release 24 with package 350, feature MC32 110
Programming user options 115
Programming Call Transfer on Radio Loss 115
Programming a system default for radio loss handling 116
Programming individual Transfer on Radio Loss 116
Registering and verifying portable telephones 119
Enabling and disabling registration 120
Locking Registration on (optional) 120
Registering portable telephones 121

Verifying a portable telephone's operation 121

Verifying Portable Credits 122

Deregistering the WTN 123

Maintenance 125

Using maintenance commands 125

Meridian 1 card maintenance 126
Administration Terminal maintenance commands 127

Maintenance features 127

System Status 128
Card Status 130
Wireless Terminal Number (WTN) Status 132
TCM Status 134
Event/Alarm log 136
Entering the Event/Alarm log 137
Checking the most recent alarm 137
Checking when an alarm or event occurred 137
Checking consecutive repetitions of an alarm or event 138
Erasing the log 138
Administration log 139
Entering the Administration log 139
Checking when an event occurred 140
Checking the most recent alarm 140
Checking consecutive repetitions of an event or alarm 140
Erasing the Administration log 141

Responding to event and alarm messages 141

Responding to an alarm code 141

System Reevaluation 142

Scheduling System Reevaluation 146

Modifying your system 148

Adding Portable Credits 148
Adding Radio Credits 149

Activating a disabled system 150

Replacing equipment 151

Adding or moving Base Stations 151
Replacing a defective Base Station 153
Adding expansion cards 154
Optimizing Card Slot Usage 156
Relocating the system 157
Replacing a defective expansion card 160
Replacing a defective ROM card 161
Replacing a defective CMCC 164
Replacing a defective remote power interconnect unit 164
Replacing a defective Remote Access Device 166
Replacing a defective Administration Terminal 166

Portable 166

Entering codes for system replacement and recovery 166

Handling Meridian Companion exceptions 168

Config warning: Recoverable inconsistency 168
Config failure: Nonrecoverable inconsistency 169
Config ambiguous 170

Troubleshooting 171

General troubleshooting procedures 171

Troubleshooting power problems 173

Troubleshooting cards 173

Normal card LED behavior 174

Troubleshooting the Administration Terminal 176

Troubleshooting a Base Station 177

Troubleshooting a remote power interconnect unit 178

Troubleshooting portable telephone problems 180
Verifying Radio Credits 182
Troubleshooting a RAD 182
Troubleshooting an alarm 183
Understanding event messages 190
Appendix A: Programming overview 195
Appendix B: Regulatory information 197
Federal Communications Commission (FCC) 197
Activation 197
Registration 197
Safety 198
Equipment attachment limitations 199
Telecom compliance 200
Telephone company notification 200
Rights of the telephone company 201
Radio Frequency Interference 201
Ringer Equivalence Number 202
Repair facility 202
Note for hearing aid users 202
List of terms 203

Introduction to Meridian Companion

The Meridian Companion application integrates wireless telephone capability into a Meridian 1 system. Meridian Companion uses radio technology to transmit and receive signals between portable (wireless) telephones and Base Stations connected to a Meridian 1 system.

Preparing to install a Meridian Companion system

Before using this guide, read *Meridian Companion Product Overview.*

The following must be completed before installing the Meridian Companion system:

❑ site planning (the process of determining the location and number of Base Stations required at a customer site)

❑ installation of the wiring required for the Base Stations

❑ installation of AC power for a plug-top power supply to power each Base Station or for a remote power interconnect (RPI) unit to power multiple Base Stations

❑ installation of primary protectors for Base Stations in applications with external exposed wiring and provisioning for placement of the secondary protectors, as needed

❑ for an ST/STE, RT, NT, or XT system, an upgrade so that the system has an IPE Module or a CE/PE Module

- ❑ preparation of the IPE Module or CE/PE Module to ensure the following:
  - — availability of sufficient contiguous slots for Meridian Companion cards (Option 11 may require an expansion cabinet)
  - — placement of all power and main distribution frame (MDF) cables
- ❑ preparation for activating wireless communications:
  - — Record the Companion ID (found on the packing slip or on the labels packaged with the software cartridge) in *Meridian Companion Programming and Provisioning Record*. You will need to provide this when you want to obtain codes.

Information derived during the site planning process is entered in *Meridian Companion Programming and Provisioning Record.* Installation requires a copy of this document plus the annotated site floor plans that were used during site planning. Check this record to make sure that all equipment and supplies are available.

Meridian Companion Site Planning Reference Manual describes these preinstallation steps.

Installing a Meridian Companion system

Installing a Meridian Companion system involves the following:

- installing, wiring, and powering hardware components:
  - — Base Stations and any external antennas
  - — plug-top power supplies, where required
  - — RPI units, if used
  - — Remote Access Device (RAD)
  - — Administration Terminal, if used
- cross connecting Base Station Time Compression Multiplexing (TCM) wires at the main distribution frame (MDF) and installing any secondary protectors needed for external exposed wiring
- connecting the RAD and setting up line for remote access

- attaching the feature ROM card to the Companion Meridian Controller card (CMCC), and then installing the Companion expansion cards in an IPE or CE/PE Module
- programming the Meridian Companion system (using the Administration Terminal or Companion Manager), excluding user options
- entering any required Portable Credit Codes and the UTAM Activation Code into the Meridian Companion system
- preparing a radio cell assignment list for Base Stations based on what you observe during reevaluation
- verifying the mobility system and making corrections as necessary
- programming the Meridian 1 wireless terminal numbers (WTNs) and enabling the cards
- programming the user options in the Meridian Companion system
- registering and verifying individual user portables
- completing *Meridian Companion Programming and Provisioning Record*

Companion Manager Installation and Operations Guide describes the installation, operations, administration, and maintenance of Meridian Companion systems through Companion Manager, a Microsoft Windows® application that runs on the Administration PC. You can use Companion Manager instead of or in addition to the Administration Terminal.

Meridian Companion Administration Terminal Operations Guide describes the programming and management of the portable telephones.

Installation warnings

Read this section carefully to ensure your safety and the safe operation of the Meridian Companion system.

WARNING!

Do not connect the Administration Terminal, Base Stations, or RAD directly to a central office (CO) line interface. Doing so may result in equipment damage.

WARNING!

To avoid damage to equipment, do not insert the plug at the free end of an Administration Terminal cord directly into a wall or baseboard outlet.

SHOCK!

Check the lightning surge arrestors at the cable entry point to the building and pay special attention to the grounding.

Report any problems to the telephone company in writing. Because Administration Terminals, Base Stations, and RADs are not lightning protected, do not install them outside the building.

SHOCK!

To avoid electrical shock hazard to personnel or equipment, observe the following precautions when installing telephone equipment:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch noninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying the telephone lines.

CAUTION!

To eliminate the possibility of accidental damage to cords, plugs, jacks, and other system components, do not use sharp instruments during assembly procedures.

WARNING!

When a Base Station is installed off-premises (when lines between the Meridian 1 system and the Base Station run between separate buildings), protect the telephone wiring and Base Station at each end with secondary lightning surge arrestors:
Oneac Corp. Model 6DP or
ITW LINX Model MP1A-90-27 or
RayChem TelTect 1-1H1-DAC (1 per unit) or
RayChem TelTect 1-Pin-DAC (1 per module) or RayChem TelTect 5-5HX-DAC (5 per unit).

CAUTION!

Base Stations can be used off-premises only with proper regulatory authority.

ATTENTION!

The Administration Terminal must not be used as off-premises equipment.

Safety precautions

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, damage to equipment, and injury to persons, including the following:

WARNING!

Unplug the system from the AC outlet and refer servicing to qualified service personnel under the following conditions:

- when a power cord is damaged or frayed
- if the equipment has been exposed to rain, or liquid has been spilled on any part of it (if this happens, allow the equipment to dry out, unplugged, to see if it still operates; do not disassemble the equipment)
- if the housing of any part of the equipment has been damaged

SHOCK!

To avoid fire or electrical shock, do not overload AC outlets and extension cords.

SHOCK!

To reduce the risk of electric shock, do not disassemble the equipment. When any service or repair work is required, contact a qualified service person.

SHOCK!

Install an AC lightning surge arrestor in the AC outlet that connects to the equipment.

Electrical surges, typically lightning transients, are very destructive to terminal equipment connected to AC power sources.

WARNING!

Unplug the equipment from the AC outlet before cleaning with a damp cloth. Do not use liquid or aerosol cleaners.

CAUTION!

Do not place any part of the equipment

- on an unstable cart, stand or table
- near or over a radiator or heat vent
- in an enclosure unless proper ventilation is provided

CAUTION!

Do not allow anything to rest on the power cord.

Do not locate the equipment where someone may walk on the power cord.

CAUTION!

Never push objects of any kind into the equipment slots.

WARNING!

Do not use any part of the equipment near water.

Never spill liquids on the equipment.

WARNING!

Do not use any telephone in the vicinity of a gas leak to report the leak.

CAUTION!

Slots and openings in the cabinet and the back or bottom are provided for ventilation. To protect the equipment from overheating, do not block or cover these openings.

CAUTION!

The equipment has a three-wire grounding type plug with a third (grounding) pin. This plug fits into a grounding type AC outlet only. This is a safety feature. If you are unable to insert the plug into the AC outlet, contact your electrician to replace your obsolete AC outlet.

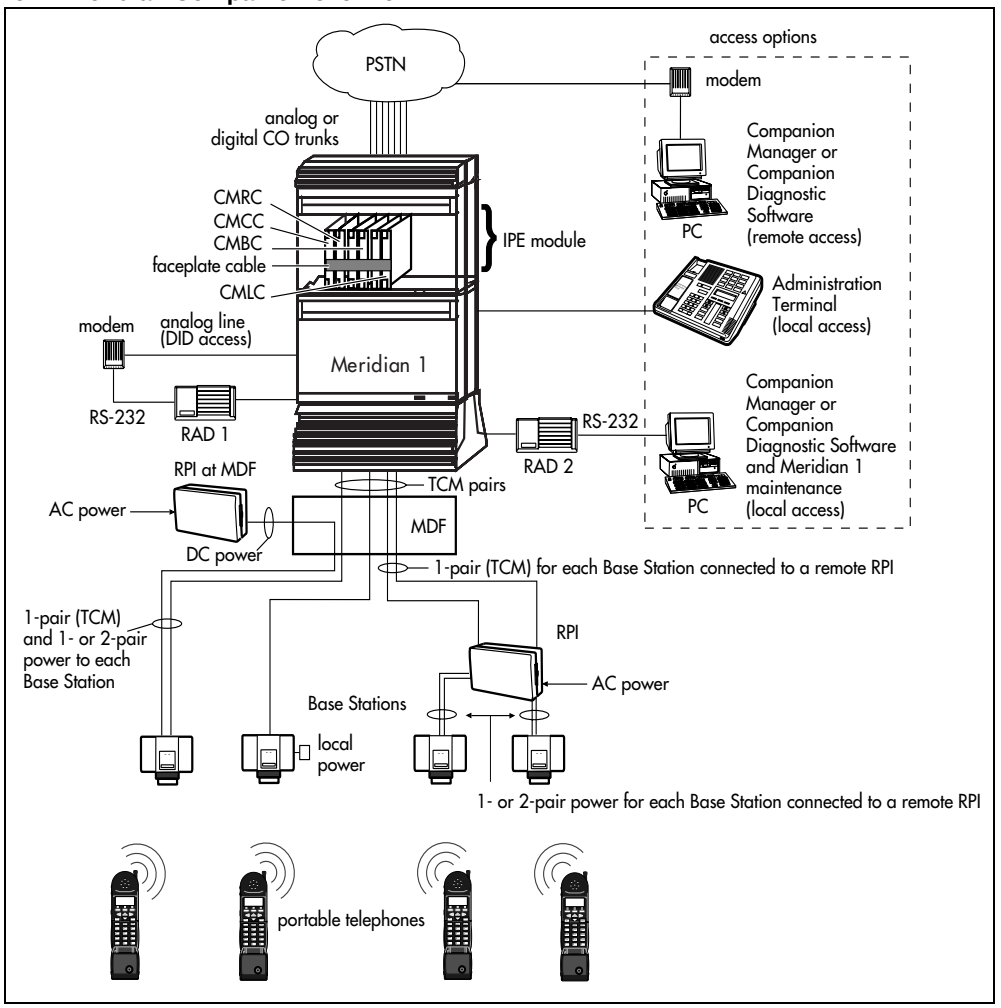
ATTENTION!

Heed the warnings and follow the instructions marked on the Meridian Companion system.

System overview

Figure 1 shows an overview of the Meridian Companion configuration.

Figure 1 : Meridian Companion overview



Installing the hardware

This section includes information on installing a Meridian Companion system. Installation should proceed in the following order:

- install Base Stations and Base Station plug-top power supplies
- install remote power interconnect units
- install external antennas and lightning surge arrestors
- install a Companion Administration Terminal
- install a Remote Access Device
- wire the Time Compression Multiplexing (TCM) lines
- install Meridian Companion cards

Note: If you plan to use Companion Manager instead of or in addition to the Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

Installing Base Stations

Before installing a Base Station, verify the position as documented in the *Meridian Companion Programming and Provisioning Record*.

Installation guidelines

ATTENTION!

Each Base Station must be installed within 4,000 ft (TCM wiring length) of the Meridian Companion system.

Consider the following points when installing Base Stations or Base Station plug-top power supplies:

- Ensure that the installation complies with your local electrical code.
- Install Base Stations indoors where there is no condensation and the temperature remains between 32°F and 120°F, preferably between 60°F and 95°F.
- Install all Base Stations within 4,000 ft (wiring length) of the Meridian 1 system.
- Do not position Base Stations on large concrete or marble columns. Base Stations must be at least 40 in. from such columns. Locate all Base Stations at a cell center on the same side of such columns.
- Position Base Stations on ceilings, or upright against walls close to the ceiling on surfaces with the same material composition.
- Allow a clearance of at least $3^1/_2$ in. between the Base Stations and surrounding objects, excluding other Base Stations (see Figure 2 on page 14).
- Position all the Base Stations at the same cell center a minimum of 54 in. apart, from the center of one Base Station to the center of another (see Figure 2 on page 14).
- Do not mount Base Stations in rows.
- If there are one or two Base Stations at the cell center, you can install the Base Stations upright on a wall or on the ceiling.

- If there are three or four Base Stations at the cell center, install them on the ceiling.
- Do not position Base Stations in ducts, plenums, or hollow spaces used to transport environmental air.
- Position Base Stations away from where a portable is used in an office area by at least the amount shown in Table 1. Installing the Base Stations on ceilings or high on walls helps to maintain these minimum distances.

Table 1 : Minimum distance between office areas and Base Stations

Number of Base Stations in the cell	Minimum distance between office areas and Base Stations
1	40 in.
2	56 in.
3	72 in.
4	80 in.

- If powering with plug-top power, position the Base Station within 12 ft of an ac outlet, since the plug-top power supply has a 12-ft cord. Keep these points in mind:
  - — the power supply must be located in an area accessible to a properly grounded ac outlet
  - — the input plug is part of the power supply (the only way to remove power is to disconnect the power supply)
  - — if you must install a new ac outlet to accommodate the power supply, ensure that the ac outlet is mounted with sufficient clearance to plug the power supply
  - — if more than one Base Station is installed at a cell center, ensure that each plug-top power supply has a separate ac outlet

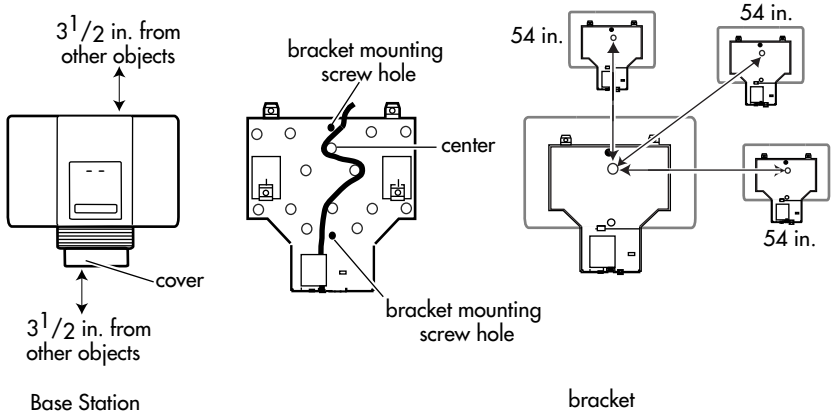
Powering a Base Station

Base Stations can be powered by plug-top power supplies or remote power interconnect units. See “Installing remote power interconnect units” or “Mounting a Base Station plug-top power supply” for your configuration.

Mounting a Base Station

Base Stations can be mounted on a wall or on a ceiling (when mounting on a wall, install it with the cover at the bottom, as shown in Figure 9 on page 22). Allow for the following clearance around the Base Station.

Figure 2 : Clearance for the Base Station



Mounting a Base Station

1. Fasten the bracket into position using two #8 $1^{1}/_{2}$-in. screws.
2. Route the telephone cable from the distribution block through the top (or bottom) opening.
3. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
4. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 16.

Figure 3 : Base Station mounting bracket detail

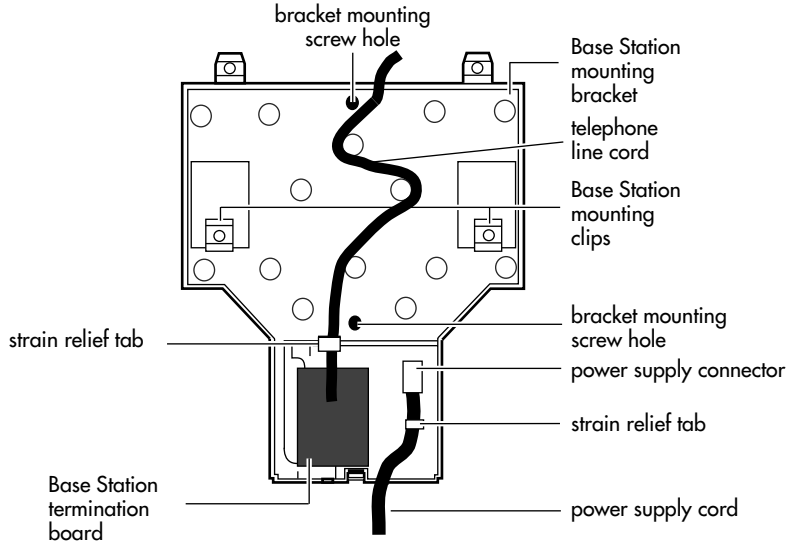
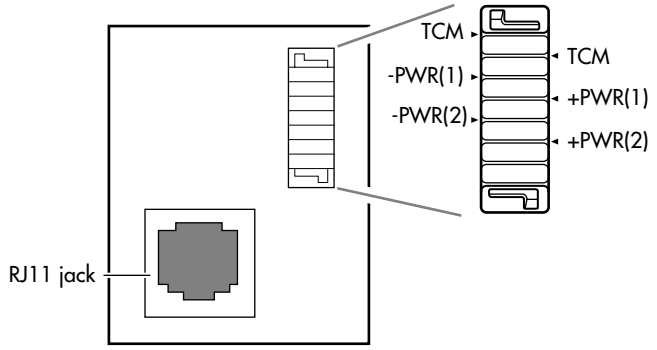


Figure 4 : Termination board



CAUTION!

Use UL approved primary and secondary lightning surge arrestors in series when installing TCM wiring outdoors.

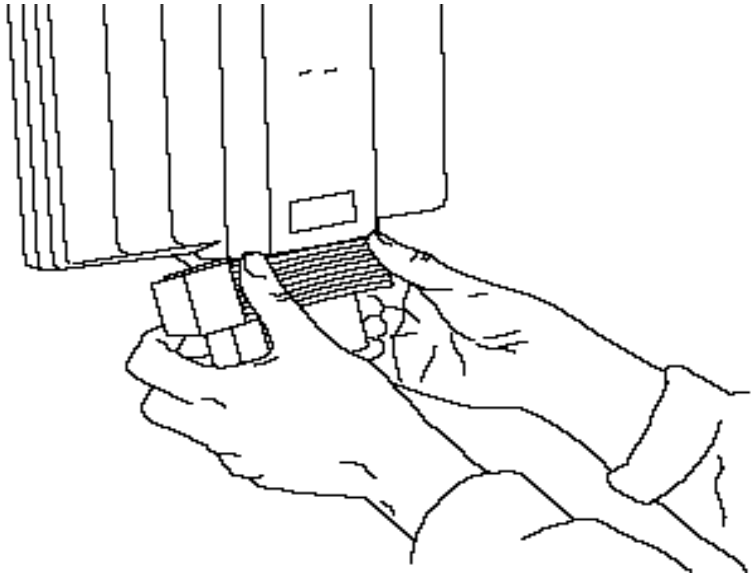
Any UL approved primary lightning surge arrestor may be used, but only an Oneac model 6-DP or ITW model MP1A-90-27 secondary lightning surge arrestor may be used.

5. Mount the Base Station onto the bracket, snapping it into position.
6. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.
7. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

   Note: Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

8. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 5 : Sliding cover onto bracket



Installing remote power interconnect units

Figures 6 and 7 illustrate two possible configuration options using a remote power interconnect (RPI) unit.

Figure 6 shows a configuration that is appropriate for a small installation where there is no main distribution frame (MDF). In this case, the RPI MDF capabilities provide the connections between the Meridian 1 system, Base Station power, and Base Stations. Essentially, the RPI unit functions as a distribution panel. This configuration can also be used if the existing MDF is full or if the customer wants to keep the wiring separate from the other telephone set wiring.

Note: The polarity of the TCM connections is not important. If *two* power pairs are brought in, they must be connected with the *same polarity* to the termination board.

WARNING!

When using two power pairs, ensure they are connected with the same polarity.

Figure 6 : Base Station powering: RPI configuration option 1

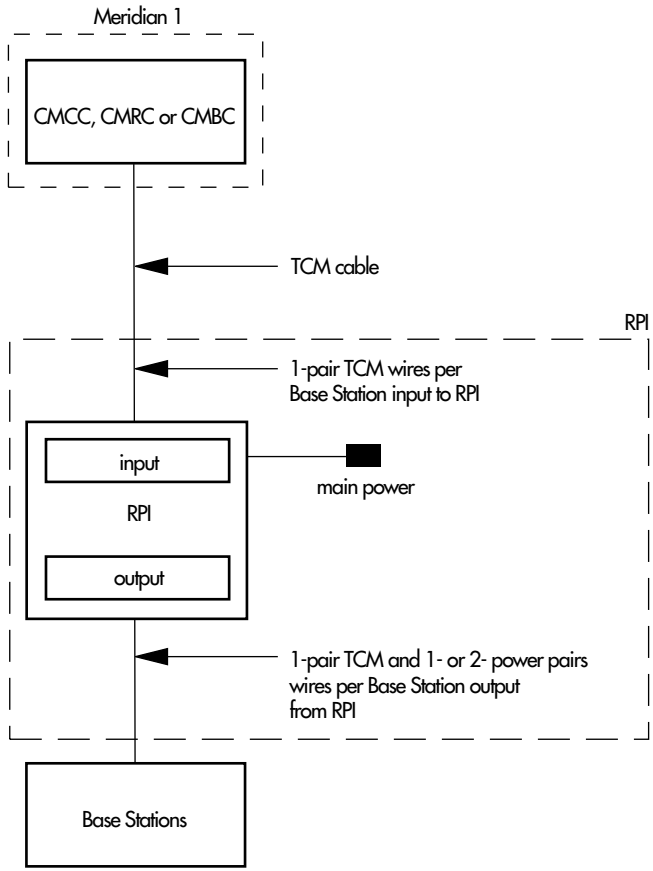
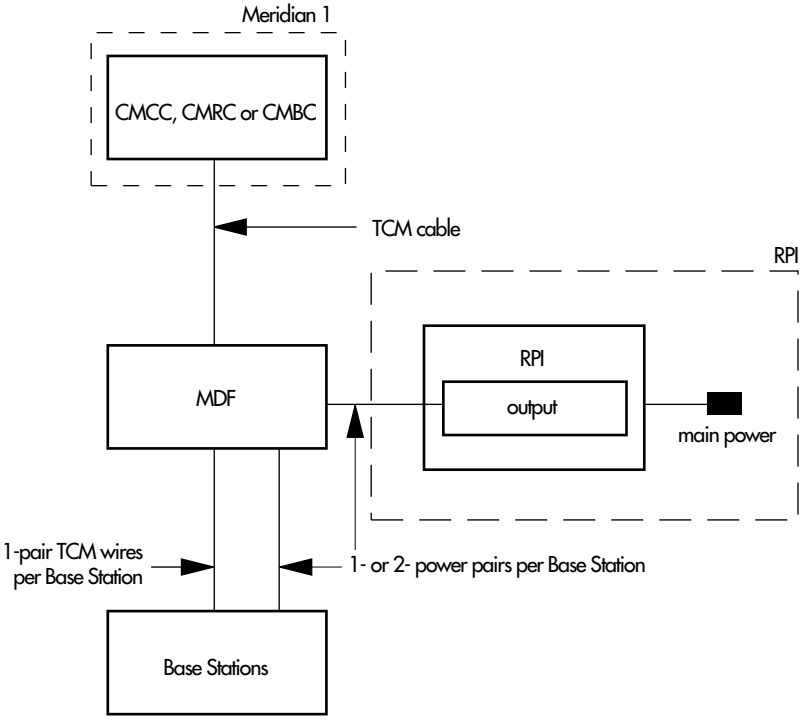


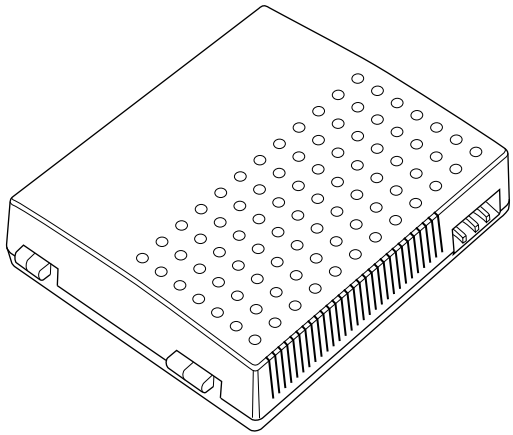
Figure 7 shows a configuration that would be suitable for a system that has an existing MDF. Typically the MDF is located in the same room as the Meridian 1 system, although it could be a closet MDF. In either case the Base Stations are wired through the MDF rather than the RPI unit.

Figure 7: Base Station powering: RPI configuration option 2



An illustration of an RPI unit appears in Figure 8. Figure 9 illustrates RPI components.

Figure 8 : RPI unit



ATTENTION!

The RPI unit should have the dc backup power supplied by a UL listed UPS.

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

ATTENTION!

The RPI units must always be installed inside a building.

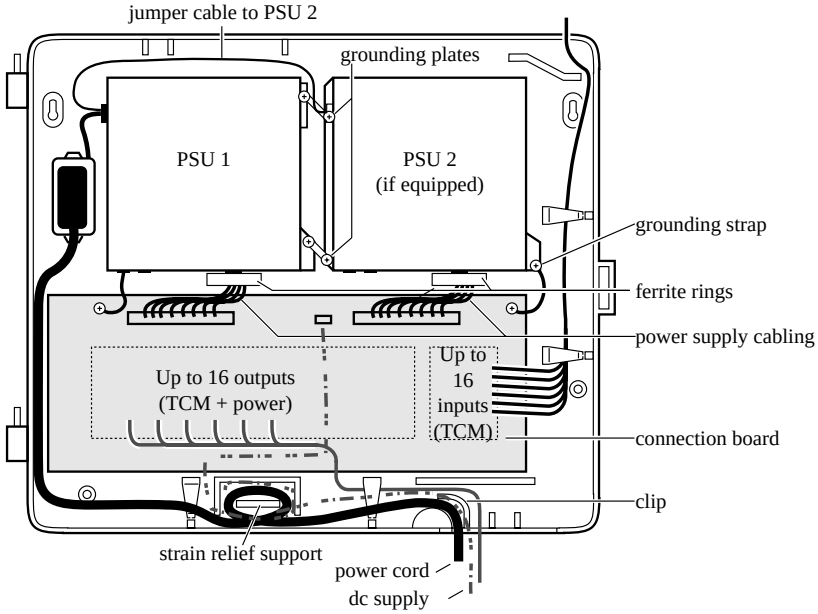
The ac outlet powering the RPI unit should be installed near the equipment and should be easily accessible.

The length of the RPI cord, from the outside surface of the unit to the plug, should be a minimum of 4 $^{1}/_{2}$ ft and a maximum of 15 ft.

WARNING!

An RPI unit should not be installed where its outputs are exposed, even when the Base Station is installed with the TCM lines exposed. An RPI unit should be installed in the same building as the Base Stations the RPI supports.

Figure 9 : RPI components



There are two versions of the RPI unit: the RPI-8 BIX UL, which supports up to eight Base Stations; and the RPI-16 BIX UL, which supports up to 16 Base Stations. Each RPI has a connection board and either one (RPI-8 BIX UL) or two (RPI-16 BIX UL) power supply units. The maximum input power consumption of an RPI is 240 W. If a UPS 48 V dc backup source is used, the maximum input power requirement of the RPI is 140 W.

You can upgrade an RPI-8 BIX UL to an RPI-16 BIX UL by attaching a second power supply unit to the RPI-8 as described on page 32.

To determine the type and number of power supply units you need for a given number of Base Stations, use Table 2 on page 23.

Note: If RPIs are distributed throughout the site, the number and type of RPIs will depend on the placement and powering plan of the Base Stations.

Table 2 : RPI requirements

Base Stations	Number of RPI-16 BIX UL and RPI-8 BIX UL required
1–8	**1** RPI-8 BIX UL
9–16	**1** RPI-16 BIX UL
17–24	**1** RPI-16 BIX UL and **1** RPI-8 BIX UL
25–32	**2** RPI-16 BIX UL
33–40	**2** RPI-16 BIX UL and **1** RPI-8 BIX UL
41–48	**3** RPI-16 BIX UL
49–56	**3** RPI-16 BIX UL and **1** RPI-8 BIX UL
57–64	**4** RPI-16 BIX UL
65–72	**4** RPI-16 BIX UL and **1** RPI-8 BIX UL
73–80	**5** RPI-16 BIX UL
81–88	**5** RPI-16 BIX UL and **1** RPI-8 BIX UL
89–96	**6** RPI-16 BIX UL
97–104	**6** RPI-16 BIX UL and **1** RPI-8 BIX UL
105–112	**7** RPI-16 BIX UL
113–120	**7** RPI-16 BIX UL and **1** RPI-8 BIX UL
121–128	**8** RPI-16 BIX UL
129-136	**8** RPI-16 and **1** RPI-8
137-144	**9** RPI-16
145-152	**9** RPI-16 and **1** RPI-8
153-160	**10** RPI-16
161-168	**10** RPI-16 and **1** RPI-8

Table 2 : RPI requirements (continued)

Base Stations	Number of RPI-16 BIX UL and RPI-8 BIX UL required
169-176	**11** RPI-16
177-184	**11** RPI-16 and **1** RPI-8
185-192	**12** RPI-16
193-200	**12** RPI-16 and **1** RPI-8
201-208	**13** RPI-16
209-216	**13** RPI-16 and **1** RPI-8
217-224	**14** RPI-16
225-232	**14** RPI-16 and **1** RPI-8
233-240	**15** RPI-16

The system configuration dictates how many RPIs are required.

Installing an RPI unit

1. Mount the RPI as described in "Mounting the remote power interconnect unit" on page 25.
2. Wire the RPI as described in "Wiring the RPI unit" on page 27.

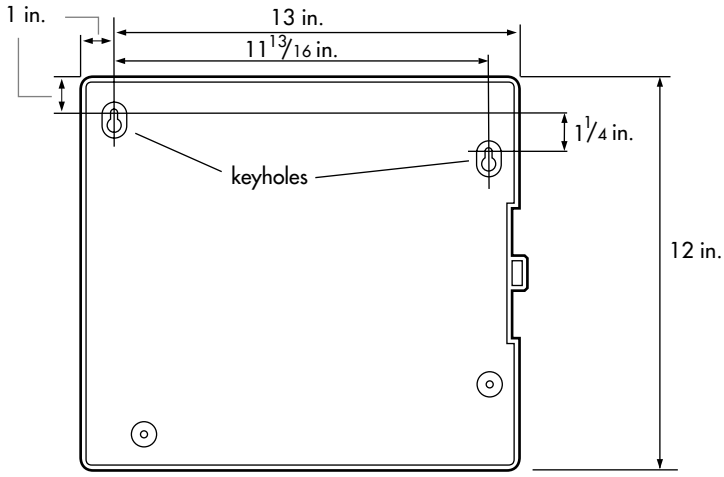
WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Mounting the remote power interconnect unit

Figure 10 : RPI mounting holes



Note: Mounting hardware is not supplied.

1. Position the screw holes for the RPI using the dimensions shown in Figure 10.

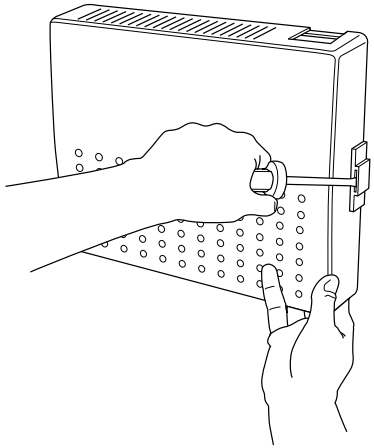
   To provide adequate ventilation and to prevent overheating, leave a clearance of at least 5 in. around the RPI.

   If mounting two RPIs, one above the other, leave a clearance of at least 1 ft between them to provide adequate ventilation and to prevent overheating.

2. Insert molly screws in the holes.
3. Partially screw in two #10 2-in. screws for the keyholes.
4. Open the hinged cover with a screwdriver by pushing in and then down to release the catch on the right side, as shown in Figure 11. You can remove the cover by taking it off its hinges.
5. Hang the RPI on the two keyhole screws and tighten them.
6. Install the remaining two screws.
7. Feed in the power cord through the bottom of the RPI and route it through the clip and around the strain relief support as shown in Figure 9.
8. Route the power cord to the input power jack just to the left of PSU 1. Connect the plug to the jack.

Note: Labeling RPIs distinctively may help with diagnosis if there are problems in the future.

Figure 11 : Opening the RPI cover



Wiring the RPI unit

WARNING!

Do not run unprotected power cables outdoors.

The outputs of an RPI unit should not be wired so that its lines are exposed.

The maximum two-way (between the RPI and the Base Station) dc loop resistance for power pairs is *75 ohms*. Each Base Station needs one or two power pairs. The exact number depends on the wire size of the power pairs and the distance between the Base Station and the RPI. Table 3 shows the approximate maximum cabling distances. Remember that interconnections increase the loop resistance.

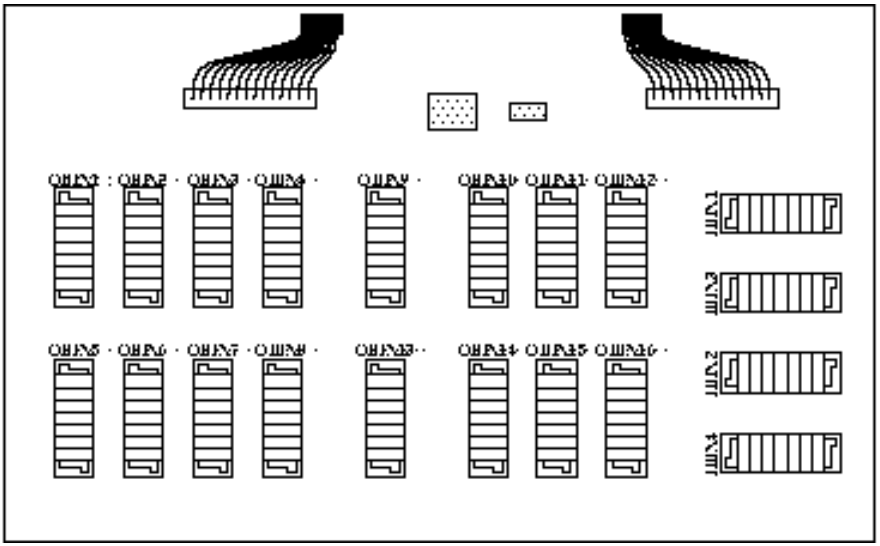
Table 3 : Maximum cabling from RPI to Base Station

Wire size	Single-pair	Double-pair
22 AWG	2,500 ft	4,000 ft
24 AWG	1,500 ft	3,000 ft

WARNING!

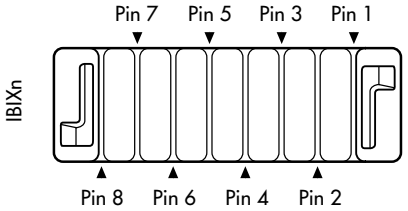
When using two power pairs, ensure they are connected with the same polarity.

Figure 12 : RPI BIX connector board



Input connections

Figure 13 : BIX input connector pinout



Wiring the RPI

1. Feed the TCM input pairs through the top of the RPI and route the pairs to the input connectors IBIX1 to IBIX4 as shown in Figure 12. There may be fewer than 16 input pairs in any RPI installation.
2. Connect the TCM pair for each Base Station to the appropriate TCM terminals. BIX connections are indicated in Table 4.

Table 4 : Wiring connections

Input connector	Pin	Signal	Output connector
IBIX 1	1, 2	TCM 1	OBIX 1
	3, 4	TCM 2	OBIX2
	5, 6	TCM 3	OBIX3
	7, 8	TCM 4	OBIX4
IBIX2	1, 2	TCM 5	OBIX5
	3, 4	TCM 6	OBIX6
	5, 6	TCM 7	OBIX7
	7, 8	TCM 8	OBIX8
IBIX3	1, 2	TCM 9	OBIX9
	3, 4	TCM 10	OBIX10
	5, 6	TCM 11	OBIX11
	7, 8	TCM 12	OBIX12
IBIX4	1, 2	TCM 13	OBIX13
	3, 4	TCM 14	OBIX14
	5, 6	TCM 15	OBIX15
	7, 8	TCM 16	OBIX16

Output connections

3. Feed the TCM output pairs in through the bottom of the RPI as shown in Figure 12 (see Figure 14 for a close-up of the pinout connection) and

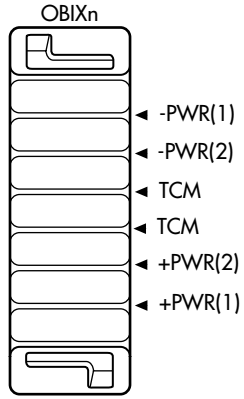
route the pairs to the output connectors. If only one pair is used for powering a Base Station, connect the power pair to -PWR(1) and +PWR(1). If two pairs are used to power a Base Station, connect one pair to -PWR(1) and +PWR(1), and the second pair to -PWR(2) and +PWR(2).

WARNING!

Ensure both power pairs have the same polarity.

Connecting two power pairs with opposing polarities may damage the Base Station and RPI.

Figure 14 : BIX output connector pinout



4. Connect the dc power pair for each Base Station to the power terminals on the same connector as in "Upgrading an RPI-8 to an RPI-16."

WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Upgrading an RPI-8 to an RPI-16

ATTENTION!

Only distributors and authorized service personnel are permitted to upgrade an RPI-8.

The RPI-8 BIX UL, which has only one power supply unit, has grounding straps and plates fitted so it can be upgraded to an RPI-16 BIX UL (see Figure 9 on page 22).

1. Power down the RPI.
2. Unscrew the grounding straps and plates.
3. Add the second power supply unit and screw down the grounding straps, the grounding plates and the power supply unit.
4. Plug the output of the power supply unit into the connector board.
5. Connect the jumper lead from PSU 1 to the lead from PSU 2.
6. Power up the RPI.

Note: The dc power supply passes through the clip and strain relief support, as shown in Figure 9 on page 22, before connecting to the terminal block by 16 AWG wire.

ATTENTION!

The RPI unit should have the dc backup power supplied by a UL listed UPS.

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

Mounting a Base Station plug-top power supply

1. Fasten the bracket into position using two #8 $1^1/_2$-in. screws.
2. Route the power supply cord through the bottom (or top) opening and under the strain relief of the bracket.
3. Route the telephone cable from the distribution block through the top (or bottom) opening.
4. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
5. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 16.
6. Mount the Base Station onto the bracket, snapping it into position.
7. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.
8. Connect the power supply connector to the Base Station power connector.

WARNING!

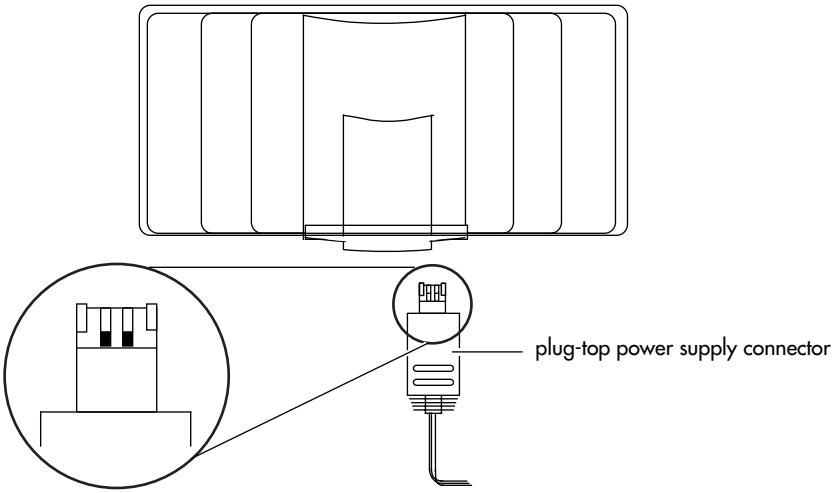
Inserting the power supply connector in the wrong direction may damage the plug-top power supply and the Base Stations.

Position the power supply connector in the proper direction and push it into place securely (see Figure 15).

CAUTION!

The Base Station should only be powered up with a class 2 plug-top power source.

Figure 15 : Plug-top power supply connector



9. Plug the power supply into the ac outlet. The green light turns on and the red light flashes (if not, see “Troubleshooting a Base Station” on page 177).

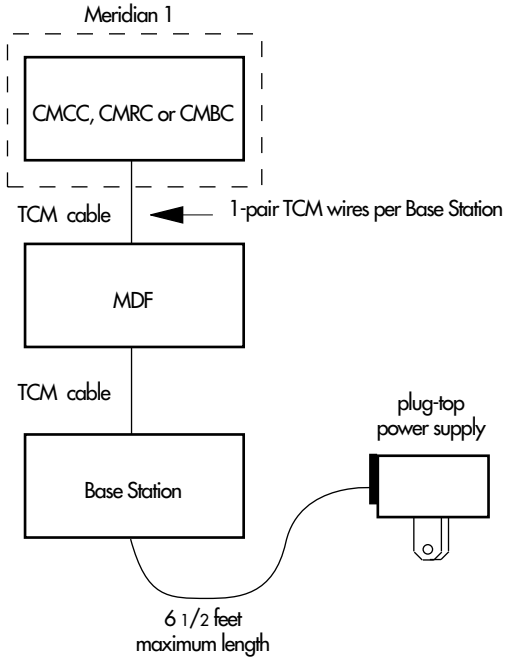
10. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

    Note: Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

11. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 16 shows a configuration for small installations in which the Base Station is located near an existing ac power source or the Base Station is farther from an RPI unit than 3,000 ft.

Figure 16 : Base Station local power



Installing external antennas and lightning surge arrestors

The following are requirements for installing external antennas and lightning surge arrestors:

- The antenna should always be mounted vertically (see Figure 17).
- Use #8 $^{1}/_{2}$-in. to 2-in. screws to mount the antenna bracket and lightning surge arrestor bracket to the wall.
- Always ensure that the antenna is clear of any adjacent obstruction, particularly metal. If more than one external antenna is used at a cell center, they should be spaced at least *40 in.* from each other to avoid radio interference problems.
- When running the coaxial cable inside or outside, do not kink, stretch, or crush the cable. This will seriously affect its performance. The minimum recommended bending radius is 8 in.
- Depending on site requirements, a proprietary extension cable can be attached between the lightning surge arrestor and the antenna or between the lightning surge arrestor and the Base Station. The total cable length should always be kept as short as possible and the recommended extension cable used only if absolutely necessary
- You must install a lightning surge arrestor for each outdoor external antenna.

DANGER!

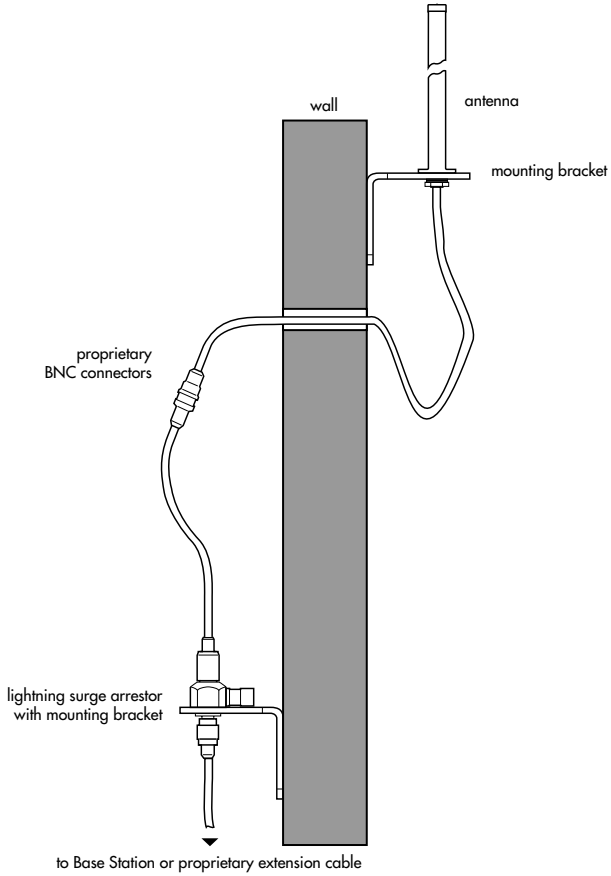
Do not install the external antenna or the lightning surge arrestor during an electrical storm.

Always turn off the Base Station power before connecting the coaxial cable of an outdoor external antenna.

Always install the lightning surge arrestor as close as possible to the cable entry point into the building.

Connect the lightning surge arrestor to ground before connecting the coaxial cable.

Figure 17 : Antenna and lightning surge arrestor



ATTENTION!

The FCC requires that only recommended antennas be connected to Base Stations.

Note: The external antenna connectors on the Base Station are special proprietary BNC connectors. Antennas are supplied with cables already attached and terminated with special proprietary BNC plugs to join with the connector on the Base Station.

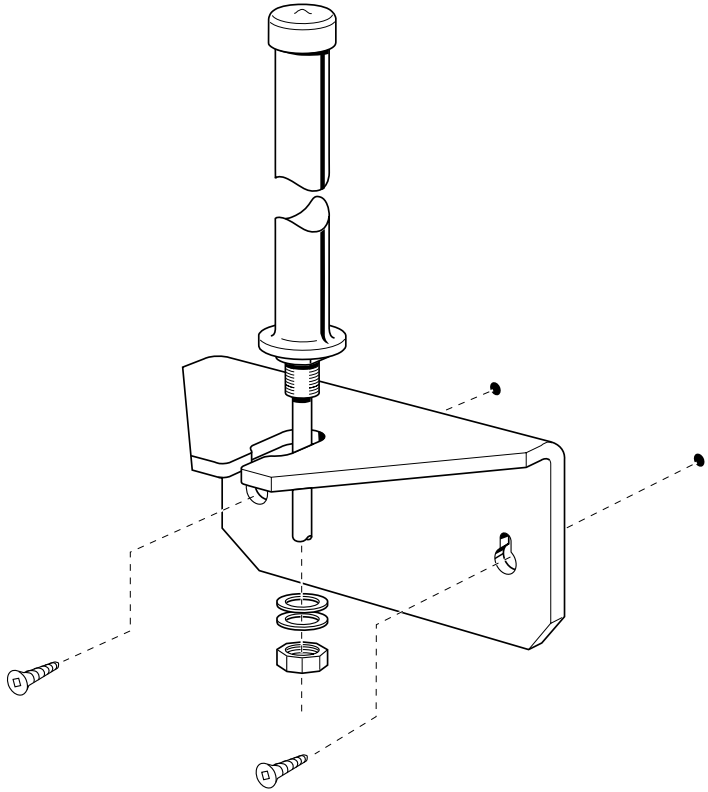
Planning for an outdoor external antenna

- Locate the antenna on the external wall of the building (see Figure 17).
- Keep the outdoor external antenna as close as possible to the Base Station serving it (the Base Station must be inside). The recommended mounting height is 13 to 16 ft above ground.
- Always install a lightning surge arrestor between an outdoor antenna and a Base Station.

Installing an outdoor external antenna

1. Drill a hole for the coaxial cable.
2. Install conduit for the antenna cable according to local building and wiring codes.
3. Screw the antenna bracket to the wall so the antenna will be positioned vertically on the exterior wall of the building (see Figure 18).
4. Loosen the nut on the antenna.
5. Slide the antenna into the slot of the bracket and tighten the nut.
6. Feed the coaxial cable through the wall to the lightning surge arrestor on the interior wall.

Figure 18 : Antenna with antenna bracket

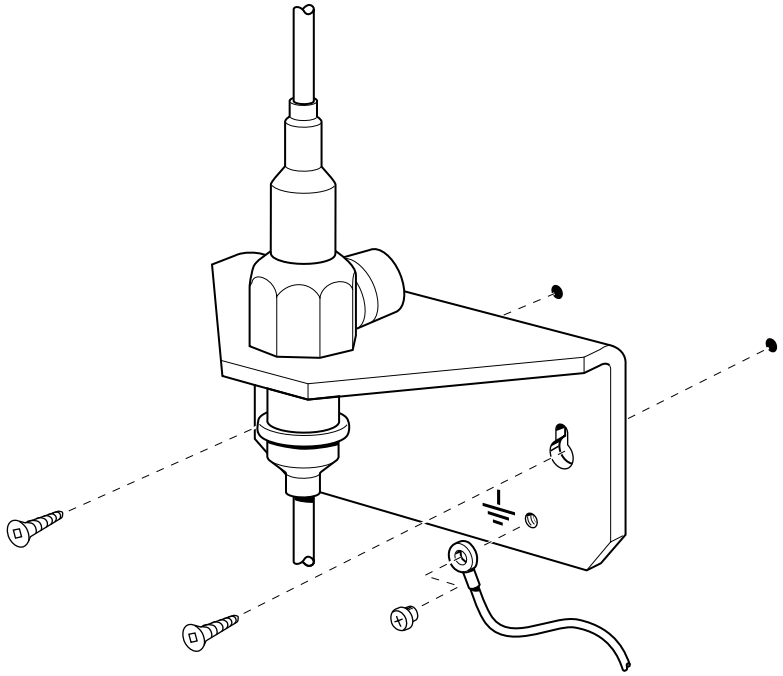


Installing a lightning surge arrestor

Install the lightning surge arrestor to protect the Meridian 1 system from electrical surges.

1. Mount the lightning surge arrestor on the interior wall as close as possible to the entry point of the coaxial cable from the outdoor external antenna (see Figure 19).

Figure 19 : Lightning surge arrestor and bracket



2. Before you connect the ground lead to the lightning surge arrestor, attach it to an approved ground.

   The recommended wire gauge is 6 AWG. Connect the ground lead to the building ground. Do not connect to a ground rod or series of ground rods. If you cannot connect the ground lead to the building ground, connect it to the steel frame of the building. (The connection should be no more than 6 to 10 ft.)

You can also connect the ground lead to the 120 V ac conduit (which is connected to the building ground), but this is not a preferred installation.

Note: The connector between the antenna and the lightning surge arrestor and between the lightning surge arrestor and the Base Station is a proprietary BNC connector and requires alignment before a connection can be made.

3. Route and connect the coaxial cable from the outdoor external antenna to the lightning surge arrestor.
4. Route and connect the coaxial cable from the lightning surge arrestor to the appropriate Base Station connector.

Installing a Companion Administration Terminal

The Companion Administration Terminal is connected to the first Companion Meridian Controller card (CMCC) Time Compression Multiplexing (TCM) port. It cannot make or receive telephone calls, but is used to program the Meridian Companion system and the portable telephones.

Note: If you plan to use Companion Manager instead of or in addition to an Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

Installing the Administration Terminal

1. Remove the Administration Terminal from its box.

   For wall mounting instructions, see “Mounting an Administration Terminal on the wall” on page 42.
2. Do not attach the receiver. (You may want to discard it because the Administration Terminal cannot be used as a telephone.)
3. Connect one end of the telephone cord to the back of the Administration Terminal and the other end to the port on the distribution block that corresponds to the first port on the CMCC.
4. Replace the four buttons below the display with the navigation button caps provided with the set.

Mounting an Administration Terminal on the wall

1. Remove the wall mounting bracket from the base of the Administration Terminal. Grip the base and, with both thumbs push up on the mounting bracket to pop it out.
2. Use a screwdriver or similar tool to remove the center knock-out panel from the base.
3. With the thin end up, hold the mounting bracket against the wall and mark the positions of the three fixing screws.
4. Route the line cord along the guide in the base and through the knocked out hole.
5. Screw the mounting bracket to the wall.
6. Connect the line cord to the jack in the base of the Administration Terminal.
7. Tuck the spare cable into the base.
8. Plug the Administration Terminal into the first port on the CMCC.
9. Snap the Administration Terminal onto the base.

Installing Companion Manager

You can use Companion Manager instead of or in addition to the Administration Terminal. For installation instructions, refer to *Companion Manager Installation and Operations Guide*. If you are running Companion Diagnostic Software (CDS) or Companion Manager on a PC, a Remote Access Device (RAD) must be installed.

Installing the PC Interface Card

The PCI card provides a physical connection between the Companion Controller and your PC. The PCI card communicates with the PC through an Input/Output port. This I/O port is a 16 byte area in PC memory between addresses 200 and 3F0(hex). The starting address of the I/O port is called the I/O base address.

The I/O base address and IRQ settings are in file `waccess.ini`, which is located in your windows root directory (usually `c:\windows`). On startup,

PCconfig backs up the existing `waccess.ini` file by renaming it `waccess.old`. If you have complex `waccess.ini` file contents (for example, TAPI or ACCESS), you should manually back up the file before running PCconfig.

The configuration tool verifies that the I/O base address and the IRQ selected for the PCI card are properly configured, and that the card is properly connected to the Controller.

Note: The configuration tool runs only on Windows 95® and Window 3.1®.

Setting the base address dip switches

The I/O base address is set using the five dip switches on the PCI card. You must select a setting that does not conflict with other hardware connected to your PC. If you are running Windows 95, you can view the I/O base address settings:

1. Press START and select Settings/Control Panel.
2. Double-click on the System icon to open the System Properties.
3. Select the Device Manager tab and press the Properties button.
4. Select the Input/output radio button.
5. Scroll through the list and ensure there is no conflict with the I/O addresses. Change the I/O base address settings on the card when there is a conflict.

You should initially set the dip switches to correspond to the I/O base address of 280h [ON,OFF,ON,ON,ON].

If you are running Windows 3.1 and you cannot view the I/O address settings, the best range of addresses is 230h to 300h.

Do not use 2F0h and 3F0h addresses. PC COMM1 AND COMM2 serial ports use addresses 2F8h and 3F8h.

On older PCI cards, the default dip switch settings correspond to I/O base address 300h. Address 300h may not work when you are running Windows 95.

Table 5 : Dip switch settings

I/O address	1	2	3	4	5
200	ON	ON	ON	ON	ON
210	ON	ON	ON	ON	OFF
220	ON	ON	ON	OFF	ON
230	ON	ON	ON	OFF	OFF
240	ON	ON	OFF	ON	ON
250	ON	ON	OFF	ON	OFF
260	ON	ON	OFF	OFF	ON
270	ON	ON	OFF	OFF	OFF
280	ON	OFF	ON	ON	ON
290	ON	OFF	ON	ON	OFF
2A0	ON	OFF	ON	OFF	ON
2B0	ON	OFF	ON	OFF	OFF
2C0	ON	OFF	OFF	ON	ON
2D0	ON	OFF	OFF	ON	OFF
2E0	ON	OFF	OFF	OFF	ON
2F0	ON	OFF	OFF	OFF	OFF
300	OFF	Same as 200s section			
. . .	OFF				
3F0	OFF				

Installing the PCI card

CAUTION!

Do not use a pencil to change the switch settings. Graphite deposits are electrically conductive and can cause a short circuit in the switch.

1. Set the five dip switches for the I/O base address you are using.
2. Power off the PC and remove the cover.
3. Insert the card in a free expansion slot.
4. Replace the cover.
5. Run a Teledapt cable from the card's LINE jack to the Controller.
6. Power up the PC.

Setting the hardware interrupt

The PCI card requires a hardware interrupt (IRQ) in the range of 3 to 7 that is not in use by another device on your PC.

Table 6 : PC hardware and IRQ settings

IRQ	Use	
3	Serial port COMM2	may be available
4	Serial port COMM1	may be available
5	Sound card, LAN, ...	often available
6	Floppy drive controller	unavailable
7	Printer LPT1	often available

The configuration tool shows you the available IRQ settings, and allows you to choose the IRQ setting for the PCI card.

Note: Ensure that an IRQ setting is available before selecting it. If equipment connected to your PC is turned off, is not currently active, or if a driver is not running, the IRQ setting may appear as available.

For example, you may select IRQ7 for the PCI card, but a printer may be using IRQ7. You may not be able to print a file when the PCI application is active.

If an IRQ is not available in the range 3 to 7, you may be able to reconfigure equipment to use a higher IRQ setting. If you are running Windows 95, you can view the equipment and the IRQ setting:

1. Press START and select Settings/Control Panel.
2. Double-click on the System icon to open the System Properties.
3. Select the Device Manager tab and press the Properties button.
4. Select the Interrupt request radio button.

Note: Older equipment may not show up in this list.

For more information on installing the PCI card, refer to PCconfig on-line help.

Installing a Remote Access Device

Refer to *Companion Remote Access Device Installation Guide*.

RAD configuration options

The configuration in Figure 20 permits local or remote access to the Meridian Companion system.

Figure 20: Local or remote access to Meridian Companion

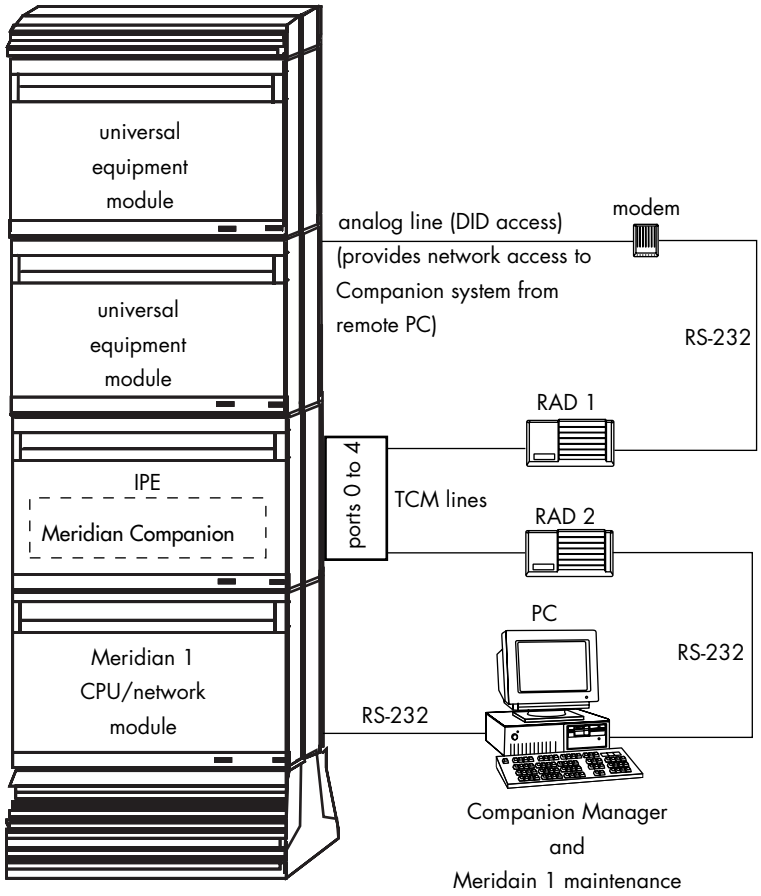


Figure 21 shows how to configure the PC when the PC handles Meridian 1 maintenance as well as Meridian Companion diagnostic software. The PC connects directly to the Meridian 1 system and connects to Companion through the RAD. In this configuration, the PC must have three serial ports to support the RAD, the mouse, and the Meridian 1 CPU.

Figure 21: Local access to shared Meridian Companion PC

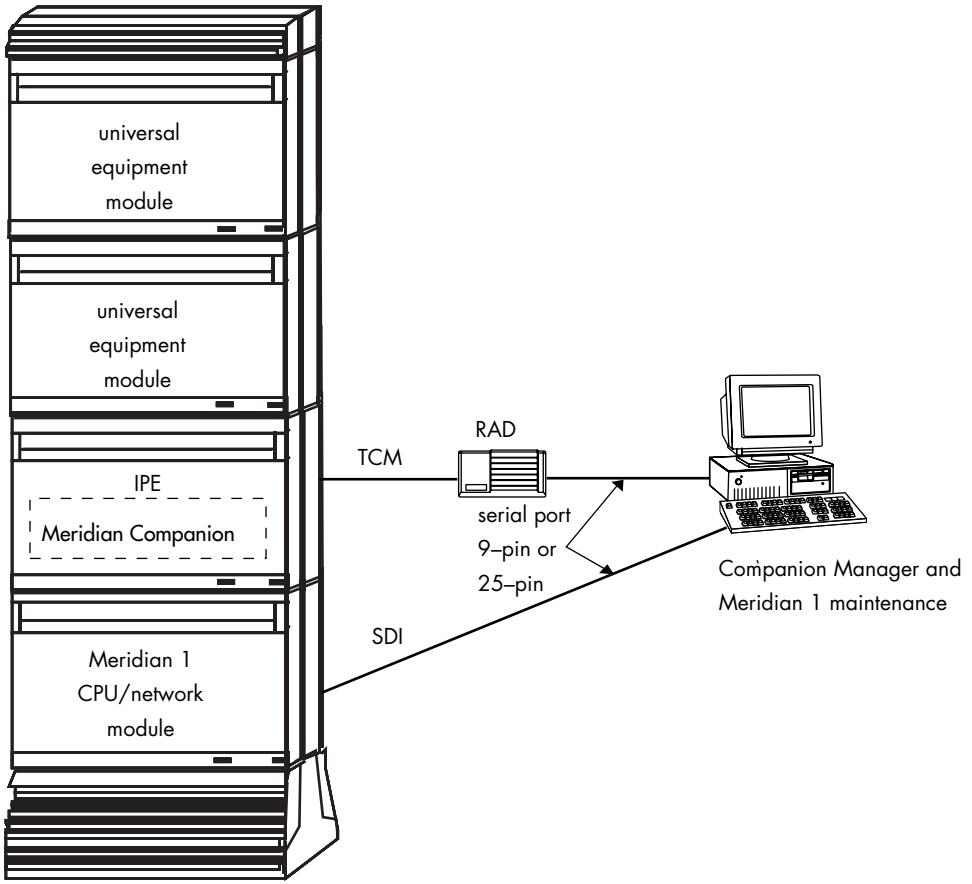
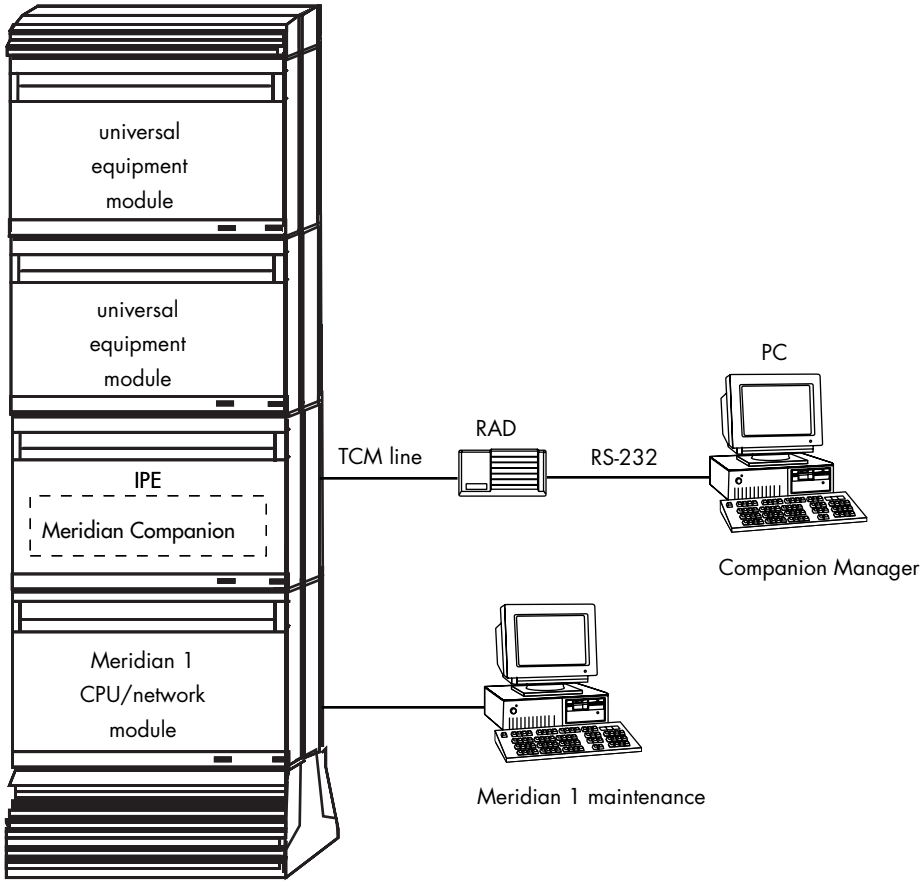


Figure 22 shows local access to Meridian Companion using a PC dedicated to Meridian Companion. In this case, the PC running the diagnostics connects directly to the RAD.

Figure 22: Local access to dedicated Meridian Companion PC



Wiring the Time Compression Multiplexing lines

The Base Stations, the Administration Terminal, and the RAD connect to the Meridian Companion cards using twisted pairs called Time Compression Multiplexing (TCM) lines.

The TCM lines on the CMCC or Companion Meridian radio line cards (CMRC) or Companion Meridian Base Station cards (CMBC) are available at the backplane on tip and ring pairs.

Planning the IPE and CE/PE Module wiring

Tables 7 through 13 show the configuration for IPE Modules and IPE slots on CE/PE Modules. Refer to the Meridian 1 system installation procedures for more information.

Table 7 : NT8D11 CE/PE Module—Line card pair-terminations with backplane cable expansion

Pair	Pins	Pair color	I/O panel connector cables/slots										Unit 24/card
			A	B	C	D	E	F	G	H	K	L	
			0	1	2	3	4	5	6	7	8	9	
1T / 1R	26 / 1	W-BL / BL-W											0
2T / 2R	27 / 2	W-O / O-W											1
3T / 3R	28 / 3	W-G / G-W											2
4T / 4R	29 / 4	W-BR / BR-W											3
5T / 5R	30 / 5	W-S / S-W											4
6T / 6R	31 / 6	R-BL / BL-R											5
7T / 7R	32 / 7	R-O / O-R											6
8T / 8R	33 / 8	R-G / G-R											7
9T / 9R	34 / 9	R-BR / BR-R											8
10T / 10R	35 / 10	R-S / S-R											9
11T / 11R	36 / 11	BK-BL / BL-BK											10
12T / 12R	37 / 12	BK-O / O-BK											11
13T / 13R	38 / 13	BK-G / G-BK											12
14T / 14R	39 / 14	BK-BR / BR-BK											13
15T / 15R	40 / 15	BK-S / S-BK											14
16T / 16R	41 / 16	Y-BL / BL-Y											15
17T / 17R	42 / 17	Y-O / O-Y											16
18T / 18R	43 / 18	Y-G / G-Y											17
19T / 19R	44 / 19	Y-BR / BR-Y											18
20T / 20R	45 / 20	Y-S / S-Y											19
21T / 21R	46 / 21	V-BL / BL-V											20
22T / 22R	47 / 22	V-O / O-V											21
23T / 23R	48 / 23	V-G / G-V											22
24T / 24R	49 / 24	V-BR / BR-V											23
25T / 25R	50 / 25	V-S / S-V											Spare

Table 8 :NTAK 11 and NTAK 12 series main and expansion cabinet wiring

Pair	Pins	Pair color	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	Unit 24/ card
			J11	J12	J13	J14	J15	J16	J17	J18	J19	J20	
			slot										
			1/ 11/21	2/ 12/22	3/ 13/23	4/ 14/24	5/ 15/25	6/ 16/26	7/ 17/27	8/ 18/28	9/ 19/29	10/ 20/30	
1T / 1R	26 / 1	W-BL / BL-W											0
2T / 2R	27 / 2	W-O / O-W											1
3T / 3R	28 / 3	W-G / G-W											2
4T / 4R	29 / 4	W-BR / BR-W											3
5T / 5R	30 / 5	W-S / S-W											4
6T / 6R	31 / 6	R-BL / BL-R											5
7T / 7R	32 / 7	R-O / O-R											6
8T / 8R	33 / 8	R-G / G-R											7
9T / 9R	34 / 9	R-BR / BR-R											8
10T / 10R	35 / 10	R-S / S-R											9
11T / 11R	36 / 11	BK-BL / BL-BK											10
12T / 12R	37 / 12	BK-O / O-BK											11
13T / 13R	38 / 13	BK-G / G-BK											12
14T / 14R	39 / 14	BK-BR / BR-BK											13
15T / 15R	40 / 15	BK-S / S-BK											14
16T / 16R	41 / 16	Y-BL / BL-Y											15
17T / 17R	42 / 17	Y-O / O-Y											16
18T / 18R	43 / 18	Y-G / G-Y											17
19T / 19R	44 / 19	Y-BR / BR-Y											18
20T / 20R	45 / 20	Y-S / S-Y											19
21T / 21R	46 / 21	V-BL / BL-V											20
22T / 22R	47 / 22	V-O / O-V											21
23T / 23R	48 / 23	V-G / G-V											22
24T / 24R	49 / 24	V-BR / BR-V											23
25T / 25R	50 / 25	V-S / S-V											Spare

Table 9 : NT8D37 IPE Module—Line card pair-terminations with backplane cable expansion, segments 0 and 1

Pair	Pins	Pair color	I/O panel connector cables/slots								Unit 24/card
			A	B	C	D	E	F	G	H	
			0	1	2	3	4	5	6	7	
1T / 1R	26 / 1	W-BL / BL-W									0
2T / 2R	27 / 2	W-O / O-W									1
3T / 3R	28 / 3	W-G / G-W									2
4T / 4R	29 / 4	W-BR / BR-W									3
5T / 5R	30 / 5	W-S / S-W									4
6T / 6R	31 / 6	R-BL / BL-R									5
7T / 7R	32 / 7	R-O / O-R									6
8T / 8R	33 / 8	R-G / G-R									7
9T / 9R	34 / 9	R-BR / BR-R									8
10T / 10R	35 / 10	R-S / S-R									9
11T / 11R	36 / 11	BK-BL / BL-BK									10
12T / 12R	37 / 12	BK-O / O-BK									11
13T / 13R	38 / 13	BK-G / G-BK									12
14T / 14R	39 / 14	BK-BR / BR-BK									13
15T / 15R	40 / 15	BK-S / S-BK									14
16T / 16R	41 / 16	Y-BL / BL-Y									15
17T / 17R	42 / 17	Y-O / O-Y									16
18T / 18R	43 / 18	Y-G / G-Y									17
19T / 19R	44 / 19	Y-BR / BR-Y									18
20T / 20R	45 / 20	Y-S / S-Y									19
21T / 21R	46 / 21	V-BL / BL-V									20
22T / 22R	47 / 22	V-O / O-V									21
23T / 23R	48 / 23	V-G / G-V									22
24T / 24R	49 / 24	V-BR / BR-V									23
25T / 25R	50 / 25	V-S / S-V									Spare

Table 10 : NT8D11 CE/PE Module—Line card pair-terminations for connectors A, B, E, H (standard)

Pair	Pins	Pair color	I/O panel connectors/slot				Unit 16/card
			A	B	E	H	
			slot 0	slot 1	slot 4	slot 7	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
				slot 2	slot 5	slot 8	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

Table 11 : NT8D11 CE/PE Module—Line card pair-terminations for connectors C, F, K (standard)

Pair	Pins	Pair color	I/O panel connector/slot			Unit 16 per card
			C	F	K	
			slot 2	slot 5	slot 8	
1T / 1R	26 / 1	W-BL / BL-W				8
2T / 2R	27 / 2	W-O / O-W				9
3T / 3R	28 / 3	W-G / G-W				10
4T / 4R	29 / 4	W-BR / BR-W				11
5T / 5R	30 / 5	W-S / S-W				12
6T / 6R	31 / 6	R-BL / BL-R				13
7T / 7R	32 / 7	R-O / O-R				14
8T / 8R	33 / 8	R-G / G-R				15
			slot 3	slot 6	slot 9	
9T / 9R	34 / 9	R-BR / BR-R				0
10T / 10R	35 / 10	R-S / S-R				1
11T / 11R	36 / 11	BK-BL / BL-BK				2
12T / 12R	37 / 12	BK-O / O-BK				3
13T / 13R	38 / 13	BK-G / G-BK				4
14T / 14R	39 / 14	BK-BR / BR-BK				5
15T / 15R	40 / 15	BK-S / S-BK				6
16T / 16R	41 / 16	Y-BL / BL-Y				7
17T / 17R	42 / 17	Y-O / O-Y				8
18T / 18R	43 / 18	Y-G / G-Y				9
19T / 19R	44 / 19	Y-BR / BR-Y				10
20T / 20R	45 / 20	Y-S / S-Y				11
21T / 21R	46 / 21	V-BL / BL-V				12
22T / 22R	47 / 22	V-O / O-V				13
23T / 23R	48 / 23	V-G / G-V				14
24T / 24R	49 / 24	V-BR / BR-V				15
25T / 25R	50 / 25	V-S / S-V				Spare

Table 12 : NT8D37 IPE Module—Line card pair-terminations for connectors B, F, L, S

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			B	F	L	S	
			slot 1	slot 5	slot 9	slot 13	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
			slot 2	slot 6	slot 10	slot 14	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

Table 13 : NT8D37 IPE Module—Line card pair-terminations for connectors C, G, M, T

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			C	G	M	T	
			slot 2	slot 6	slot 10	slot 14	
1T / 1R	26 / 1	W-BL / BL-W					8
2T / 2R	27 / 2	W-O / O-W					9
3T / 3R	28 / 3	W-G / G-W					10
4T / 4R	29 / 4	W-BR / BR-W					11
5T / 5R	30 / 5	W-S / S-W					12
6T / 6R	31 / 6	R-BL / BL-R					13
7T / 7R	32 / 7	R-O / O-R					14
8T / 8R	33 / 8	R-G / G-R					15
			slot 3	slot 7	slot 11	slot 15	
9T / 9R	34 / 9	R-BR / BR-R					0
10T / 10R	35 / 10	R-S / S-R					1
11T / 11R	36 / 11	BK-BL / BL-BK					2
12T / 12R	37 / 12	BK-O / O-BK					3
13T / 13R	38 / 13	BK-G / G-BK					4
14T / 14R	39 / 14	BK-BR / BR-BK					5
15T / 15R	40 / 15	BK-S / S-BK					6
16T / 16R	41 / 16	Y-BL / BL-Y					7
17T / 17R	42 / 17	Y-O / O-Y					8
18T / 18R	43 / 18	Y-G / G-Y					9
19T / 19R	44 / 19	Y-BR / BR-Y					10
20T / 20R	45 / 20	Y-S / S-Y					11
21T / 21R	46 / 21	V-BL / BL-V					12
22T / 22R	47 / 22	V-O /O-V					13
23T / 23R	48 / 23	V-G / G-V					14
24T / 24R	49 / 24	V-BR / BR-V					15
25T / 25R	50 / 25	V-S / S-V					Spare

Installing Meridian Companion cards

STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Meridian Companion includes five different types of cards:

- a required Companion Meridian Controller card (CMCC)
- optional Companion Meridian radio line cards (CMRC)
- optional Companion Meridian line cards (CMLC)
- optional Companion Meridian base station cards (CMBC)
- a required ROM feature card, which is a daughter board of the Controller card (CMCC)

If a new IPE Module is required, make sure that it has been installed and powered up before installing the Meridian Companion system.

Keep these points in mind when installing cards:

Note: When you install a CMBC card connect at least one Base Station to it before you power on the system to prevent a `Config ambiguous` alarm

- The cards must all reside on a single IPE Module.
- The cards must be grouped in adjacent slots on the IPE Module (or IPE slots on the CE/PE Module).
- The CMCC can be installed anywhere on the IPE Module, but it must be located to the left of the other Companion cards.
- Any Companion expansion cards must be installed, in any order, to the right of the CMCC, and must be installed before installing the CMCC.
- The cards should be installed and connected from right to left. The CMCC is the last card to be installed and connected.

- Activating octal density with the MC32 feature density doubles the WTN capacity of the CMCC, CMRC, and CMLC cards
- When installing cards into an Option 11 core or expansion cabinet, note the actual slot location of the CMCC. You will need to verify this location when programming the system (see “CMCC slot” on page 82 for more information).

ATTENTION!

If the card slot address requires an adjustment and you do not make this adjustment, the WTN addresses will not be consistent with the M1 addresses.

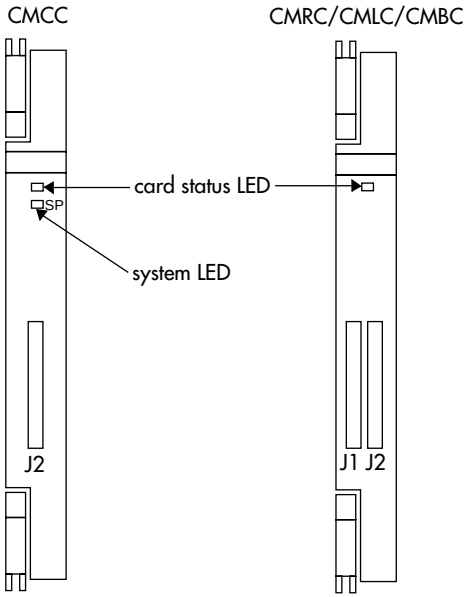
Faceplate 60-wire cabling connects the CMCC to the other cards in a daisychain. A long faceplate cable (bypass faceplate cable harness) is available to connect cards across the NT8D01 Controller card if necessary.

Normal LED behavior upon installation

All Companion cards are equipped with a card status LED. The CMCC is also equipped with a system LED, labelled SP (system processor).

The card LED is the top LED on the CMCC and the only LED on the expansion cards. It is not labeled on any cards. If the LED is on, the card is out of service and can be safely removed. If the LED is off, the card is in service and should not be removed. The difference between a regular line card and a Meridian Companion card is that the Meridian Companion card must be disabled from *both the Meridian 1 and the Meridian Companion sides* before the LED goes from *off* to *on*. Conversely, for a completely disabled card (LED is on) the LED goes off instantly when the card is enabled from either side.

Figure 23 : Card LED locations



When the card is first installed or powered up, the LED goes on for approximately 3 seconds, then flashes three times to indicate that the firmware self-test sequence is operating properly. If the LED does not follow this pattern, the card is defective and must be replaced.

The system LED is the bottom LED on the CMCC. It indicates the status of the Controller software. Its state affects the state of all other cards. When the CMCC is first installed, the system LED does the following:

- Does not flash but remains on for approximately 5 seconds.
- Goes off for approximately 5 seconds.
- Begins flashing to indicate that connected cards and TCM devices are initializing.

If this normal pattern (on/off/flashing) does not occur, refer to “Normal card LED behavior” on page 174. LED behavior following initialization depends on whether the CMCC has been programmed and whether expansion cards have been connected, as described in Table 40: Card LED behavior, on page 175.

Placing the cards

Figure 24 shows how cards appear on the IPE Module in Option 21 through Option 81 systems.

Figure 24: IPE Module—Meridian Companion possible placement of cards

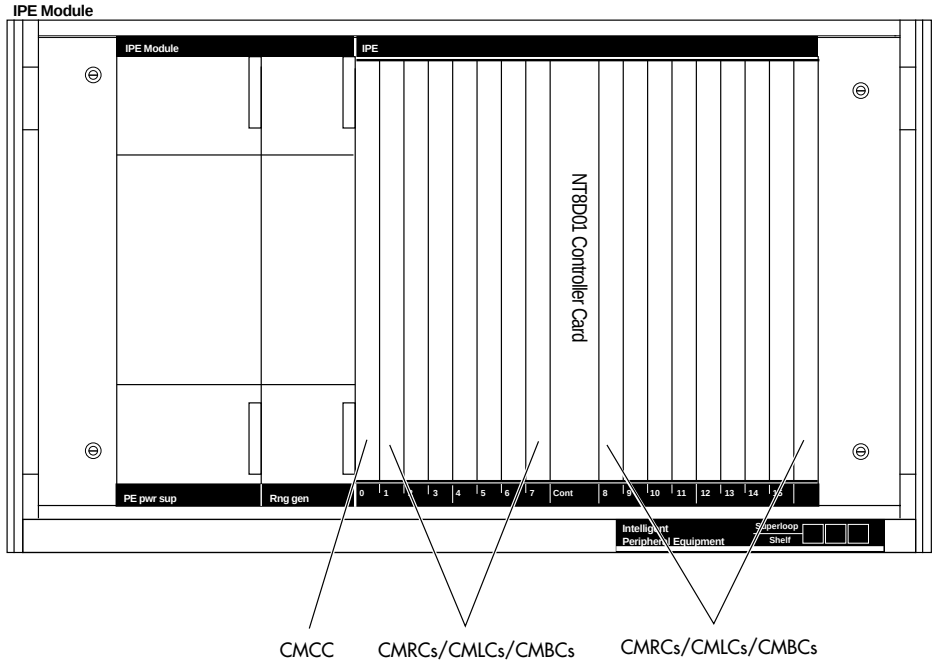


Figure 25 shows the card configuration on a CE/PE Module. The illustration lists other cards that can be located on the CE/PE Module.

Figure 25: CE/PE Module—Meridian Companion possible placement of cards

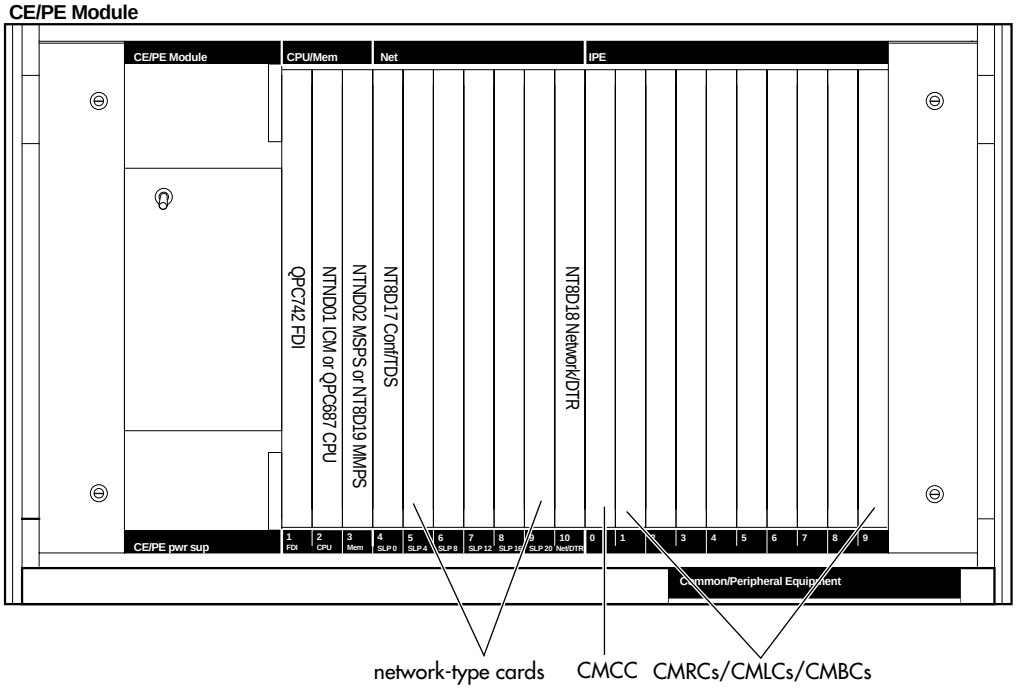


Figure 26 and Figure 27 show card placement in Option 11 systems. The cards can be placed in slots 1 through 9 on the system shelf, as shown in Figure 26, or in an expansion cabinet, as shown in Figure 27. Option 11 systems that are not using Meridian Mail can also install a Companion card in slot 10. The illustrations indicate the kinds of cards that can be included in the Option 11 system.

Figure 26: Option 11 Meridian Companion card configuration—Main cabinet

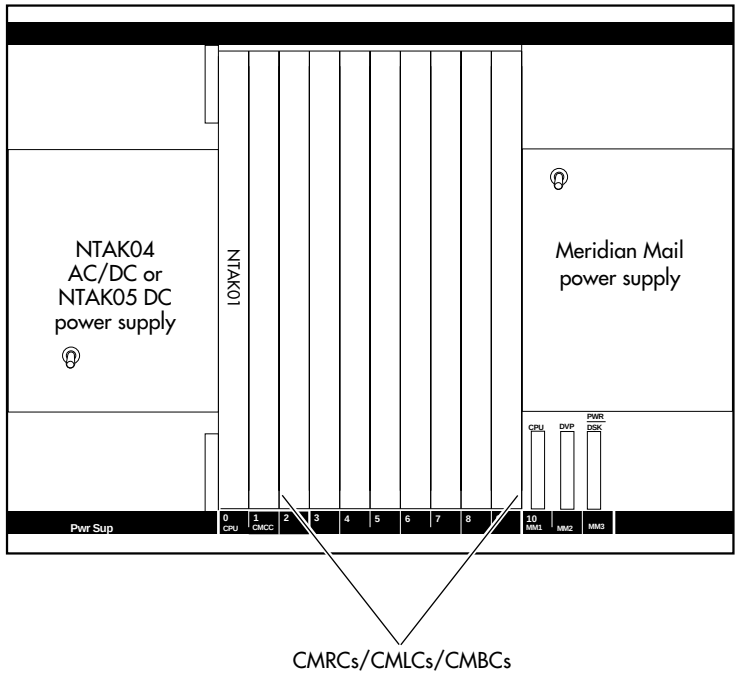
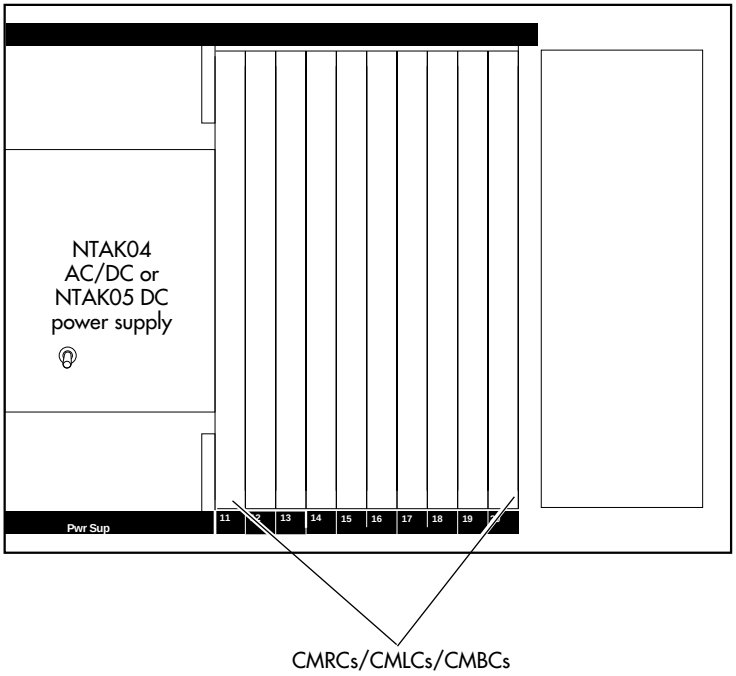


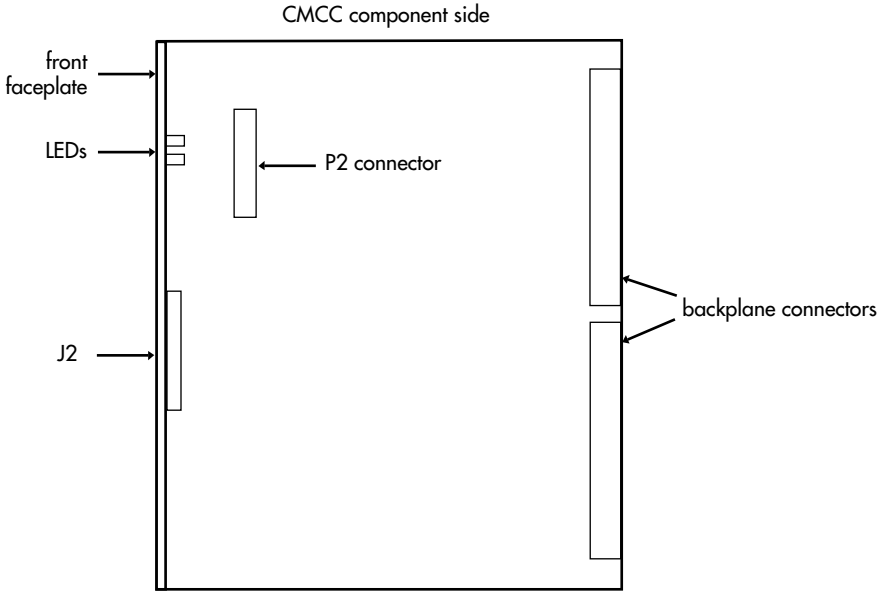
Figure 27: Option 11 Meridian Companion card configuration—Expansion cabinet



Installing the cards

1. Install all expansion cards for your system first. If you are not using expansion cards, proceed to step 3. Verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 59.
2. Connect each card with the adjacent cards, moving from *right to left*, using the interboard faceplate cable harness and the bypass faceplate cable harness, for IPE shelves only. (Both are 60-wire faceplate cables. The bypass cable is an extra long cable used on Option 51 through Option 81 IPE shelves to connect cards across the NT8D01 Controller Card.) Do not leave empty slots between cards.
    a. Make sure the red wire is at the bottom of the cable. (The cable is polarized to guard against incorrect insertion.)
    b. Insert the J2 (right) cable plug into connector J1 (left) on the card on the far right.
    c. Insert the J1 (left) cable plug into connector J2 (right) of the next card.
    d. Insert the J2 plug of the next cable harness into connector J1 of the next card.
    e. Use a blunt object to press the cable plug and then close the connector latches securely. Do not use the latches to press the cable plug.
    f. Continue inserting cables from right to left, joining the J1 plug of one line card with the J2 connector of the next line card, until the daisychain reaches the CMCC on the left most card.
    g. Leave the last faceplate cable hanging for CMCC installation.
3. Insert the two plastic ROM card standoffs into the CMCC holes that are aligned with the ROM card holes.
4. Slide the ROM card into the right-angled connector mate P2 on the CMCC.

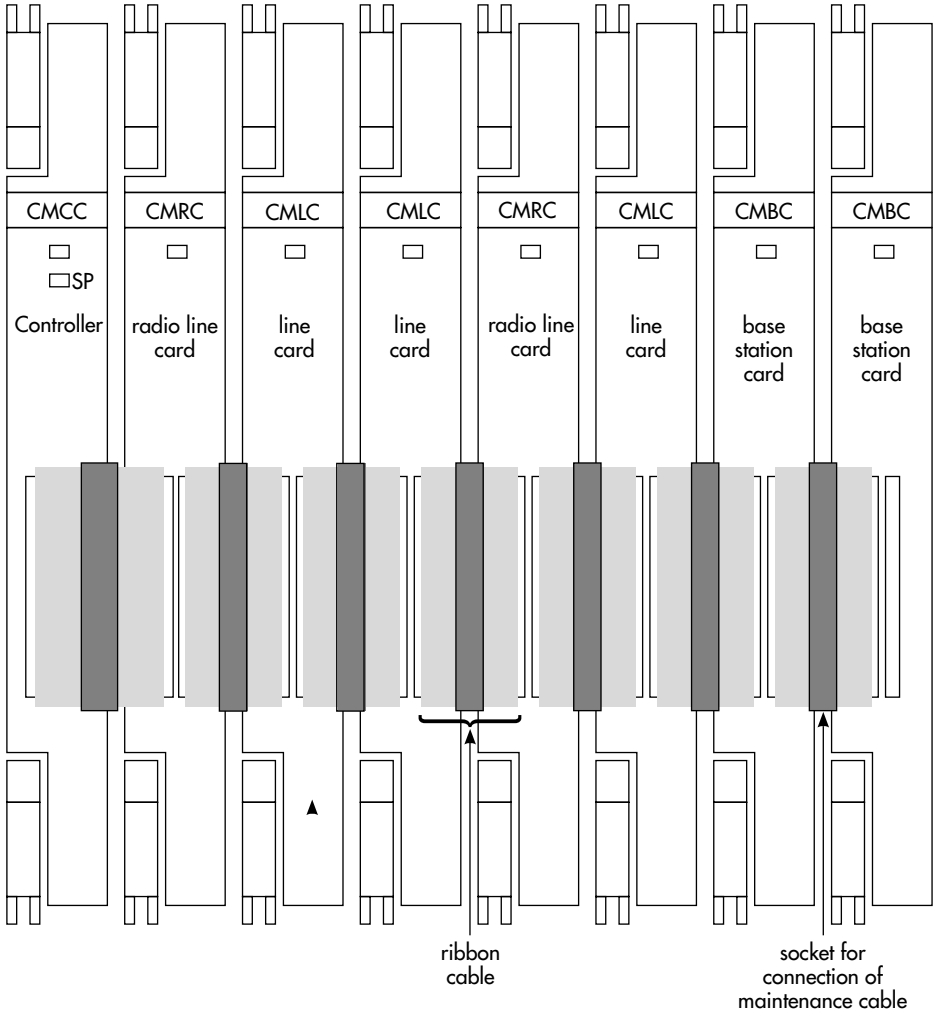
Figure 28: P2 plug location



5. Fasten the ROM card securely to the standoffs.
6. Install the CMCC on the IPE Module. The CMCC must be located to the left of any CMRC, CMLC or CMBC.
7. Connect the J1 plug of the last faceplate cable to the CMCC and verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 59.

Figure 29 illustrates how the system looks after you have installed cards and interboard faceplate cable harnesses.

Figure 29: Example of cards



System initialization

Once the CMCC is installed and powered, the system begins initialization.

Verifying initialization

Are arrow indicators flashing?

If the indicators on the Administration Terminal do not flash, see "Troubleshooting the Administration Terminal" on page 176.

Do you see `System coldstart`?

If display does not show `System coldstart`, see "Memory Reset" on page 70. After performing a Memory Reset, the display shows `System startup`.

Did you install more Base Stations?

New installations may require a Base Station software update. The system will begin downloading the software to the Base Stations, if required.

Note: If you are upgrading an existing system or you have added Base Stations, you may see two Base Station software download messages on the Administration Terminal display.

The Administration Terminal display shows `BS-1 Dload Start`. Some Base Stations may not be powered up at the same time; this message will repeat at the beginning of each download.

The Administration Terminal shows BS 1 Dload Done when all the Base Station software is downloaded. Some Base Stations may not be powered up at the same time, so this message may repeat.

Does the display show any of these messages?

If display shows	and the system	then
UTAM code req'd	is a new system	Proceed with programming as described on page 73.
	is a previously initialized system	Apply UTAM Activation Codes, Portable Credit Codes and any UTAM Recovery Codes. You will also require a new UTAM Recovery Code before the system can be brought online (see “Activating a disabled system” on page 150).
UTAM test failed		See Table 42 on page 183.
Config Ambiguous	contains CMBC	Ensure a Base Station is connected to the CMBC. See Table 42 on page 183.

Memory Reset

Memory Reset reinitializes the system, erasing any existing system memory and resetting it to the factory default values.

ATTENTION!

Only the installer should perform Memory Reset.

Memory Reset erases all system data and clears all active calls. The registration information is part of the system data. If this data is erased, your portables will not work properly.

You must enter the Memory Reset code no later than 15 minutes after the Meridian Companion system has been powered up. If you enter the Memory Reset code at any time after the 15-minute interval, you hear an error tone, and the display shows Startup denied. If 15 minutes have elapsed since you powered up the system, remove and reinsert the CMCC to prepare for Memory Reset.

Performing Memory Reset

1. Press Feature , then * * 1 . The display shows Password: .
2. Enter the Installer password. The default password is 0 0 0 0 .

   If the password is correct, the display shows Erase all data? .

   If the password is incorrect, the display shows Password: . Press RETRY and enter the password again.

ATTENTION!

Memory Reset will erase your system data!

Pressing Yes returns all the data in your system to the factory defaults. To exit with no impact on your system data, press Rls .

3. Press YES to reset the memory. The display shows Defaults applied and system initialization begins.

Programming the Meridian Companion system

For the system to operate properly, you must

- verify the presence of cards and Base Stations
- verify and, if necessary, reprogram the telephony data parameters
- program mobility data
  - program the Base Station radios that have an external antenna
- set the time and date
- set passwords

For information about using Companion Manager to program a Meridian Companion system, refer to *Companion Manager Installation and Operations Guide*.

Before programming a Meridian Companion system, see “Verifying a Meridian Companion installation” on page 99 to verify the installation.

The Meridian Companion Programming and Provisioning Record

Record all programming in *Meridian Companion Programming and Provisioning Record*. *Meridian Companion Programming and Provisioning Record* is divided into two groups of information: system-wide programming and user-specific programming.

The Administration Terminal

The Meridian Companion system can be programmed by means of an Administration Terminal. The Administration Terminal has a two-line display and three types of buttons. You cannot make or receive calls on the Administration Terminal when connected to a Meridian Companion system. It is used only for system programming and maintenance.

Buttons

Administration Terminal buttons enable you to program and maintain the Meridian Companion system:

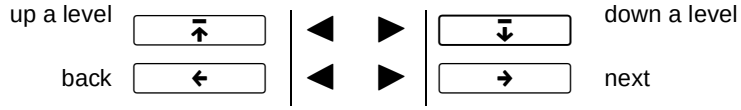
- Feature Use the Feature button to begin a programming session on the Administration Terminal.
- Rls Use the Release button to end a programming session on the Administration Terminal.

Display buttons The Administration Terminal has three display buttons directly below the display. During feature operation or programming, these display buttons provide options relating to the top line of text on the display. Available options appear on the bottom line directly above the corresponding display button.

The options above the display buttons are indicated in this guide in a special underlined typeface (for example, OK). The other text in the display is shown in the special typeface but not underlined (for example, Password:).

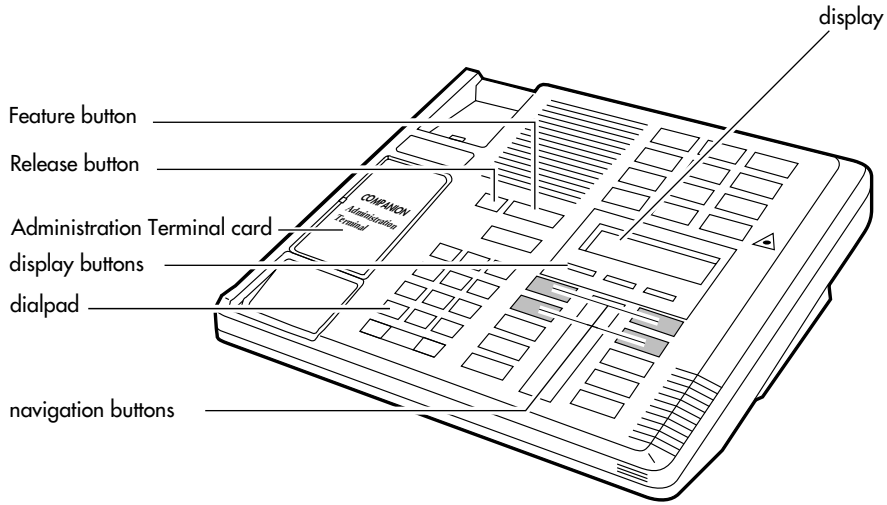
Dialpad buttons You use the Administration Terminal's dialpad buttons to enter feature codes and to select digits or letters when you need to enter a value on a display. You can enter letters as well as the digits represented on the dialpad buttons when programming some features (for example, System LID).

Navigation buttons The Administration Terminal has four navigation buttons directly below the display buttons. Use these buttons to search through programming options and settings. When a navigation button can be used, an arrow (◀ or ▶) appears in the window beside it. The navigation buttons are arranged as follows:



If the navigation buttons on your Administration Terminal do not correspond to the above arrangement, remove the button caps and place them on the correct buttons. The buttons below the navigation buttons are not used and have been disabled.

Figure 30 : Administration Terminal



Operating the Administration Terminal

Adjusting the contrast

If you find the Administration Terminal's display difficult to read, you can adjust the contrast.

Note: This feature will not work while you are in a Configuration, Maintenance, or Administration session.

1. Press Feature * 7 . The display shows `Contrast level` followed by the current contrast level expressed as a digit.
2. Press a dialpad button between 1 and 9 to select a new contrast level, or press DOWN or UP .
3. Press OK or Rls to select the contrast level you prefer.

Entering a Configuration programming session

1. Press Feature * * 0 .
2. Enter the Installer password. The default password is 0 0 0 0 (see "Changing passwords" on page 88).

   If the password is correct, the display shows `A. Configuration` .

   If the password is incorrect, the display shows `Password:` . Press RETRY and enter the password again.

By using the arrow keys, you can select a programming category and find the appropriate submenus for items you want to program.

Entering an Administration session

1. Press Feature * * 9 . The display shows `Password:` .
2. Enter the Administration password. The default password is 9 9 9 9 (see "Changing the Administration password" on page 90).

   If the password is correct, the display shows `1. Registration` .

   If the password is incorrect, the display shows `Password:` . Press RETRY and enter the password again.

Note: You can also enter an Administration session using the Configuration password. Once you complete steps 1 and 2 in "Entering a Configuration programming session" on page 76, press [→] then [↓] . The display shows `1. Registration` .

Ending a programming session

To end Configuration programming or an Administration session, press [RIs] . The display shows `End of session` .

Recording and reporting alarm messages

Alarm messages appear on the display of the Administration Terminal when the Meridian Companion system generates an alarm. Your Meridian Companion supplier can interpret these messages to detect problems affecting system operation. The Administration Terminal must be connected to port 00 on the Controller to receive alarm messages.

This is an example of an alarm message:

```
Alarm:    51-3
TIME      CLEAR
```

See Table 42 on page 183 for other alarm messages.

If an alarm message appears on the Administration Terminal's display

1. Record the alarm message in *Meridian Companion Programming and Provisioning Record.*
2. Press `TIME` and record the time and date displayed.
3. Press `CLEAR` to clear the alarm.
4. Call the system support representative to report the alarm message.

Verifying card status

Before performing any programming, it is important to verify that all cards are present on the system at the expected location. Use the following procedure to search through all card slot addresses pertinent to the Meridian Companion cards installed on the system.

1. Press Feature * * 0 and enter the Installer password.
2. From A.Configuration, press → until the display shows C.Maintenance .
3. Press ↓ then → until the display shows 2. Card Status .
4. Press ↓ . The display shows Show card .
5. You can enter a number or press ↓ to see the first card. The display shows Cnn: followed by the card type: CMCC, CMRC, CMLC, or CMBC.
6. Press STATE .
7. Press → to search through all slots, verifying that all cards are idle as described in “Card Status” on page 130.
8. Follow diagnostic procedures as necessary.

Note: The CMBC must have at least one powered Base Station connected for the system to recognize it.

Verifying Base Station status

Before performing any programming, it is important to verify that all Base Stations are present on the system at the expected location.

You can verify Base Station status by checking that every Base Station is connected to a CMCC, CMRC, or CMBC.

Note: If a Base Station is not connected to a CMCC, CMRC, or CMBC, the MDF wiring is incorrect, the Base Station connections are incorrect, the powering is off (check the RPI), or the Base Station is defective. Correct and repeat the process before continuing with system programming.

Verifying that a Base Station is associated with the specified TCM port

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press → until the display shows C. Maintenance .
3. Press ↓ then → until the display shows 4. TCM status .
4. Press ↓ . The display shows Show TCM: .
5. You can enter a TCM device number or press ↓ to see the first TCM device.

   The display shows T followed by the five-digit device port number and the device type: BS-1 (Base Station), RAD, or 7310 (M7310 Administration Terminal).
6. Press STATE . All BS-1s should be in the Maint state.
7. Search through TCM devices by pressing → . The display should reflect the maintenance state. If it does not, refer to “Troubleshooting a Base Station” on page 177.

Programming telephony data

Adjust telephony defaults only if instructed to do so via a product bulletin or other authority. The following telephony values can be changed:

- Dial delay
- B03 gain values
- Side tone
- CMCC slot
- WTN

Dial delay

Dial delay is the time between the selection of an outgoing call line and transmission of the telephone number’s first digit. The delay ensures that dial

tone is present before transmission. Delay ranges from 200 ms to 2,000 ms, in 200 ms increments, with a default of 1,000 ms.

Changing the Dial delay setting

1. Press Feature * * 0 and enter the Installer password.
2. From **A. Configuration** , press ↓ . The display shows **1. Telephony Data** .
3. Press ↓ . The display shows **Dial delay:** followed by the current delay value.
4. Press CHANGE until the desired delay value appears.
5. Record the programmed Dial delay in *Meridian Companion Programming and Provisioning Record*.
6. Press Rls to exit or press → to continue setting telephony data.

B03 gain value modification

The Meridian Companion system contains digital interconnections that establish various digital signal paths within the system. There are currently five paths.

- PBX (Meridian 1) to CPP (Cordless Portable Part)
- CPP (Cordless Portable Part) to PBX (Meridian 1)
- PBX (Meridian 1) to RAD
- RAD to PBX (Meridian 1)
- TONE (DTMF signal generator) to PBX (Meridian 1)

Note: See “List of terms” on page 203 for further explanation of terms.

By default, the gain associated with the paths upon installation is 0. Product bulletins or other special circumstances may require the installer to adjust the gain values.

Values are stored in increments of 0.1 dB, although they appear on the display without decimals. For example, a value of 4.7 dB is stored as 47. A positive

value represents a gain; a negative value represents a loss. If a value outside the valid range is entered, the closest valid value is used.

Adjusting gain values

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration, press ↓ . The display shows 1. Telephony Data .
3. Press ↓ , then → until the display shows B03 Gain Values .
4. Press ↓ . The display shows PBX – CPP: followed by the current value.
5. Press CHANGE to enter a new value.
6. Press +/– to indicate a negative or positive value.
7. Enter the digits. Remember that digits appear without decimal points. Press BKSP to make corrections. Press OK when you have entered the value.
8. Press → to search for the next signal path.
9. Press Rls to exit or press → to continue setting programming features.

Portable telephone side tone

This option enables (you can hear your own voice when using the portable) or disables (you cannot hear your own voice when using the portable) the side tone. The default setting at installation is On (side tone enabled). This is the proper setting for most installations. If required, you can change the setting by following this procedure:

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press ↓ . The display shows 1. Telephony Data .
3. Press ↓ then → until the display shows Side tone: .
4. Press CHANGE to switch between On (side tone enabled) and Off (side tone disabled).

5. Press [Rls] to exit or press [→] to continue setting telephony data.

CMCC slot

CMCC slot allows you to verify, and if necessary, adjust the card slot address reported by the Meridian Companion system. Certain system configurations may require you to adjust the address (value) by applying an offset value. Contact your distributor if you require additional information about the system configuration. The display shows the address as `cc xuu`, where `cc` is the card slot address, `x` indicates the type of adjustment (positive, negative, or unchanged), and `uu` is the offset value. If an adjustment is required, upon reset, the offset is applied to each card slot address as the cards come online.

ATTENTION!

If the card slot address requires an adjustment and you do not make this adjustment, the WTN addresses will not be consistent with the M1 addresses.

Changing the CMCC slot address

1. Press [Feature] [*] [*] [0] and enter the Installer password.
2. From `A. Configuration` , press [↓] . The display shows `1. Telephony Data` .
3. Press [↓] , then [→] until the display shows `CMCC slot:` followed by the slot address.
4. Press [→] to continue in telephony data if the card address is correct, or press + or – until the correct card slot address is displayed.
5. Press `APPLY` when the correct address is displayed. The display shows `Warm Reset?` .
6. Press `RESET` to save the new address and begin a warm reset.

Note: `CANCEL` does not save any of the changes and does not initiate a warm reset.

7. Repeat steps 1 to 4 (after the warm reset) to verify the correct address has been applied. The offset value will also be displayed. This value may be important for troubleshooting purposes.

WTN

With X11 release 24 and the MC32 feature (package 350), the number of wireless terminals per card can be changed from 16 to 32.

Changing the number of wireless terminals per card

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press ↓ . The display shows 1. Telephony Data .
3. Press ↓ , then → until the display shows 16 WTN or 32 WTN.
4. Press → to continue in telephony data if the number of wireless terminals per card is correct, or press CHANGE until the correct number of wireless terminals per card is displayed (either 16 WTN or 32 WTN).
5. Press APPLY when the correct number of wireless terminals per card is displayed. The display shows Warm Reset? .
6. Press RESET to save the change and begin a warm reset.

CANCEL does not save any of the changes and does not initiate a warm reset.

Programming mobility data

By default, the system has no radios assigned to any cells upon installation. Assignment occurs when the wireless system is activated. Up to eight radios can be assigned to a cell. A radio cannot be assigned to more than one cell, and reassigning a radio to a new cell automatically deletes the radio from its former cell.

Before activating the wireless system, you may have to program the antenna settings or the System Access Logical Identifier.

A five-digit number identifies each radio. The first four digits indicate the card and unit number (ccuu) associated with the Base Station. The last digit indicates the number of the radio on that Base Station, 1 or 2.

"Setting the antenna type for a radio" on page 84 applies to sites that are using one or more external antennas. The procedure described in "Setting the System Access Logical Identifier" on page 85 is optional and applies only to a small number of sites.

Setting the antenna type for a radio

You must tell the system when an external antenna is installed or removed. The default at system startup is `internal`. Record the current setting in *Meridian Companion Programming and Provisioning Record.*

1. Press [Feature] [*] [*] [0] and enter the Installer password.
2. From `A. Configuration`, press [↓] . The display shows `1. Telephony data` .
3. Press [→] . The display shows `2. Mobility Data` .
4. Press [↓] then [→] until the display shows `Radios`.
5. Press [↓] . The display shows `Radio credits` .
6. Press [→] . The display shows `Show radio:` .
7. Enter the five-digit number of the radio you wish to program. The display shows `Cell Assignment` .
8. Press [→] . The display shows `Antenna Type` .
9. Press [↓] . The display shows the radio number (`ccuum`) followed by either `internal` or `external`, depending on the current setting.
10. Press `CHANGE` to change to the other antenna type.
11. Record the antenna type programmed for the radio in *Meridian Companion Programming and Provisioning Record*.
12. Press [→] to switch the setting of the next radio, or press [Rls] to exit.

Note: You must run System Reevaluation (see page 142) after changing antenna settings.

Setting the System Access Logical Identifier

The four-digit Logical Identifier (LID) lets the Meridian Companion system identify itself to portable telephones, and the portables use it to request service from the system. The LID must be a hexadecimal number (four characters composed of a combination of the digits 0 to 9 and the letters A to F) between 0500 and FFFE. The default is randomly generated by the system at startup. The LID generally should not be modified.

There are only two reasons to modify the LID.

- The site has multiple Meridian Companion systems, and you want users to be able to move from system to system without changing slots on their portable telephones. All systems must be set to the same LID.
- Two systems that are located near each other were accidentally assigned the same LID; users of one system can access the other system. (This highly unlikely situation could occur, for example, in an office building occupied by multiple organizations.)

ATTENTION!

Changing the LID disables all portables.

If you change the LID on an existing system that has registered portables, you will invalidate the registration of all the portables on the system. Portables must be reregistered before they can be used with the system, or the LID must be changed back to its previous value.

Only an installer should change the LID.

1. Press Feature * * 0 and enter the Installer password.
2. From `A. Configuration`, press ↓ . The display shows `1. Telephony Data` .
3. Press → . The display shows `2. Mobility Data` .
4. Press ↓ then → until the display shows `System LID: xxxx` .
5. Press CHANGE to change the LID.

6. Enter the new system LID.

   Note: To enter 1, 4, 5, 6, 7, 8, 9, or 0, press the corresponding dialpad button. To enter A, B, C, D, E, F, 2, or 3, press the dialpad button indicated in the following table until the desired character is displayed.

Character	Dialpad button	Press
A	2	once
B	2	twice
C	2	three times
2	2	four times
D	3	once
E	3	twice
F	3	three times
3	3	four times

7. When you have entered the desired character, press --> to move the cursor to the next character position.

8. Repeat steps 6 and 7 until four characters have been entered.

   To correct a character, press <-- or --> to move the cursor to the desired position, then repeat step 6.

9. Press OK . If the LID entered is valid, the display shows `LID changed` , then `System LID:` followed by the new System LID.

   If the LID entered is not valid, the display shows `LID not changed` . Go back to step 5 and repeat the process.

10. Record the new LID in *Meridian Companion Programming and Provisioning Record*.

11. Press Rls to exit or press ↑ to continue in Configuration programming.

Programming the system time and date

The Meridian Companion system maintains its own time and date rather than using the Meridian 1 time and date. It is important that the time and date be correct for event and alarm messages.

An idle Administration Terminal displays the current system time and date when it is functioning properly. Portable telephones do not display time and date.

Program the time and date as soon as the system is operating, and adjust the time and date whenever necessary. The time should be reset after the yearly switches to and from daylight savings time so that system messages have the correct time and date. It is also necessary to reprogram the time (and other settings) if the CMCC has been powered down for maintenance or for any other reason.

Programming the system time

1. Press Feature * * 9 and enter the Administration password. The display shows **1. Registration** .
2. Press → until the display shows **3. Time and Date** .
3. Press ↓ . The display shows **Time** and the current setting.
4. Press CHANGE . The display shows **Hour:** . If you do not want to change the hour, go to step 7.
5. Press CHANGE . The display shows **Hour:** .
6. Enter the hour in 12- or 24-hour format, as one or two digits. (The Administration Terminal displays the time in 12-hour format.)
7. Press → . The display shows **Minutes:** . If you do not want to change the minutes, press → twice to continue in the Administration session. To exit, press Rls .
8. Press CHANGE . The display shows **Minutes:** .
9. Enter the minutes as one or two digits.
10. Press → . If the hour entered was less than or equal to 12, the display indicates **AM** or **PM** . Press CHANGE to select AM or PM.

11. Press Rls to exit or press → to continue in Administration programming.

Programming the system date

1. Press Feature * * 9 and enter the Administration password. The display shows `1. Registration` .
2. Press → until the display shows `3. Time and Date` .
3. Press ↓ . The display shows `Time` and the current setting.
4. Press → . The display shows `Date` and the current setting.
5. Press CHANGE . The display shows `Year:` . If you do not want to change the year, go to step 8.
6. Press CHANGE . The display shows `Year:` .
7. Enter the last two digits of the year.
8. Press → . The display shows `Month:` . If you do not want to change the month, go to step 11.
9. Press CHANGE . The display shows `Month:` .
10. Enter the month as one or two digits.
11. Press → . The display shows `Day:` . If you do not want to change the day, go to step 14.
12. Press CHANGE . The display shows `Day:` .
13. Enter the day of the month as one or two digits.
14. Press Rls to exit or press → to continue in Administration programming,

Changing passwords

Changing the Installer password

To enter Configuration and Administration programming, Maintenance, and Memory Reset, you must use the Installer password. The default password is

0 0 0 0 .The Installer password must have at least one digit and no more than six digits.

ATTENTION!

You should change the Installer password after the system is installed to protect the integrity of the settings.

To prevent unauthorized access, provide the Installer password only to selected personnel.

ATTENTION!

Record your password.

Record any password changes in *Meridian Companion Programming and Provisioning Record*. If you forget the Installer password, you will not be able to enter Programming, Maintenance, Memory Reset, or System Startup.

1. Press Feature * * 0 to enter Configuration programming. The display shows `Password:` .
2. Enter the Installer password. The display shows `A. Configuration`.
3. Press ↓ then → until the display shows `3. Admin. Set Data` .
4. Press ↓ . The display shows `Installer pswd.` .
5. Press CHANGE . The display shows `New pswd:` .
6. Enter a new one- to six-digit Installer password. Use BKSP to correct your entry if necessary.
7. Press OK . The display shows `Re-enter:` .

   If you do not enter any digits and press OK , the display shows `Pswd not changed` .
8. Reenter the digits and press OK . The display shows `Password changed`.

If the display shows `Pswd not changed`, you did not enter the same password again. Go back to step 5.

9. Record the new Installer password in *Meridian Companion Programming and Provisioning Record*.
10. Press [Rls] to exit or press [→] to continue in Configuration programming.

Changing the Administration password

The one- to six-digit Administration password gives a system administrator access to Administration programming. The default password is [9] [9] [9] [9] .

ATTENTION!

You should change the Administration password after the system is installed to protect the integrity of the settings.

To prevent unauthorized access, provide the Administration password only to selected personnel.

1. Press [Feature] [*] [*] [9] . The display shows `Password:` .
2. Enter the Administration password. The display shows `1. Registration` .
3. Press [→] until the display shows `4. Passwords` .
4. Press [↓] . The display shows `Admin. password` .
5. Press CHANGE . The display shows `New pswd:` .
6. Enter up to six digits for the new password. Use BKSP for corrections.

ATTENTION!

If you leave the Administration password blank (by entering no digits in step 6), the password will be erased. If you erase the password, anyone can enter Administration programming without restriction. (The display shows `Password erased`.)

7. Press OK to confirm the new password. The display shows Re-enter: .
8. Reenter the new password and press OK . The display shows Password changed .

   If the display shows Pswd not changed , you did not enter the same password again. Go back to step 5.
9. Record the new password in *Meridian Companion Programming and Provisioning Record*.
10. Press Rls to exit or press → to continue in Administration programming.

Changing the Registration password

You must enter the Registration password on each portable to successfully register it with the Companion system. The default password is 7 2 3 4 6 (or R A D I O), but you should set your own password. You can choose any combination of one to six digits. You will find it easier to remember the password if the numbers correspond to a word.

ATTENTION!

You should change the Registration password after the system is installed to protect the integrity of the settings and to avoid adjacent systems from having the same password.

To prevent unauthorized access, provide the Registration password only to selected personnel.

1. Press Feature * * 9 . The display shows Password: .
2. Enter the Administration password. The display shows 1. Registration .
3. Press → until the display shows 4. Passwords .
4. Press ↓ . The display shows Admin. password .
5. Press → . The display shows Reg. password .
6. Press CHANGE . The display shows New pswd: .

7. Enter a new one- to six-digit Registration password. Use BKSP for corrections.

8. Press OK . The display shows Re-enter: .

   Note: If you do not enter any digits and press OK , the display shows Pswd not changed .

9. Reenter the digits and press OK . The display shows Password changed .

   If the display shows Pswd not changed , you did not enter the same password again. Go back to step 6.

10. Record the new Registration password in *Meridian Companion Programming and Provisioning Record*.

11. Press Rls to exit or press → to continue in Administration programming.

Activating wireless communications

The Federal Communications Commission (FCC) has appointed UTAM Inc. as the body responsible for coordinating and verifying the installation or relocation of personal wireless communication devices operating between 1.92 GHz and 1.93 GHz. This allows UTAM Inc. to monitor and control the level of wireless activity within this band for a specified geographical location.

To comply with this requirement, the Meridian Companion system uses codes and credits to control user capacity and to ensure system location verification.

Codes and credits

There are two types of codes associated with a new system activation. Each 24-digit code, which comes in three eight-digit parts, is unique to a Meridian Companion System Security Number (SSN).

Portable Credit Code

Portable Credit Codes predefine the maximum number of portables that can be registered to the system. Systems can only register as many portables as there are available Portable Credits.

If you want to add portable telephones to a system later on, you will require additional Portable Credit Codes.

UTAM Activation Code

The UTAM Activation Code activates wireless capability on a new system and in system upgrades involving Base Stations. The system software recognizes

Base Stations as Radio Credits. If you increase the size of a system later on, you will require additional UTAM Activation Codes.

Accessing the Nortel IVR system

When calling in to the Nortel Customer Response Center (1-800-321-2649), be sure to have the Companion ID, System Security Number, customer site address, and zip code information on hand. See Table 14 on page 95 for IVR menu options and descriptions.

You require codes when initially installing wireless equipment or relocating wireless equipment.

Companion ID

The Companion ID is required to obtain activation codes and credits. This number is located on the packing slip and on the labels packaged with the software cartridge. You should record this number in *Meridian Companion Programming and Provisioning Record.*

System Security Number

The System Security Number (SSN) is automatically generated by the Meridian Companion system when the system is first powered up. The SSN is a unique number to identify the system. For information on how to retrieve the SSN, see “Activating a new system” on page 96.

Table 14 : Nortel IVR menu options

IVR menu option	Select this menu option when...
1.New Install	you require a UTAM Activation Code and a Portable Credit Code to bring a system on-line for the first time. Both UTAM Activation Codes and Portable Credit Codes are generated at this time. ***Note:*** Do not end the session until both codes are retrieved.
2.Upgrade	you require additional codes to increase the size of a system. You may require UTAM Activation Codes, Portable Credit Codes, or both. Upgrade codes are not released until there is an approved purchase order.
3.Regression	the system's original SSN has changed. The regression code is used to change a new SSN back to the original. See "Troubleshooting portable telephone problems" on page 180.
4.Recovery	you require a recovery code because a UTAM test failed. See "Activating a disabled system" on page 150.
5.Old Codes	you require a complete history of all codes that have been generated for a system.

Activating a new system

To activate wireless communication on the Meridian Companion system, you must first obtain and then enter a UTAM Activation Code and a Portable Credit Code.

1. Enter Configuration programming.
2. Press [↓] . The display shows `1. Telephony Data` .
3. Press [←] until the display shows `4. Software Codes` .
4. Press [↓] . The display shows `SSN:nnnnnnnn` . Record the SSN in *Meridian Companion Programming and Provisioning Record*.
5. Call the Nortel Customer Response Center at 1-800-321-2649 to retrieve the codes.

   Record the Portable Credit Code and the UTAM Activation Code on the "UTAM Activation and Portable Credit Codes" table in the *Meridian Companion Programming and Provisioning Record*.
6. Press [→] . The display shows `Codes` .
7. Press [↓] . The display shows `Code 1:` . Enter the first eight-digit number of the Portable Credit Code and press `OK` .
8. The display shows `Code 2:` . Enter the second code number and press `OK` .
9. The display shows `Code 3:` . Enter the third code number and press `OK` .
10. The display shows `Codes` . Press [↓] .
11. The display shows `Code 1:` . Enter the first UTAM code and press `OK` .
12. The display shows `Code 2:` . Enter the second code number and press `OK` .
13. The display shows `Code 3:` . Enter the third code number and press `OK` .

14. The display shows `Entry successful` and then `Codes` . Press [RIs] to exit. The system will now start reevaluation and the display will show `Re-Eval in prog.` , `Radios left:nnn` , `Re-Eval complete` , `System online` , as the reevaluation runs its course. If the display shows something different, see Table 42 on page 183 for troubleshooting tips.

    Note: If the UTAM Activation Code entry is unsuccessful, the display shows `Invalid code`. If this happens, reenter the code or call Nortel Customer Response Center 1-800-321-2649 for assistance.

Verifying a Meridian Companion installation

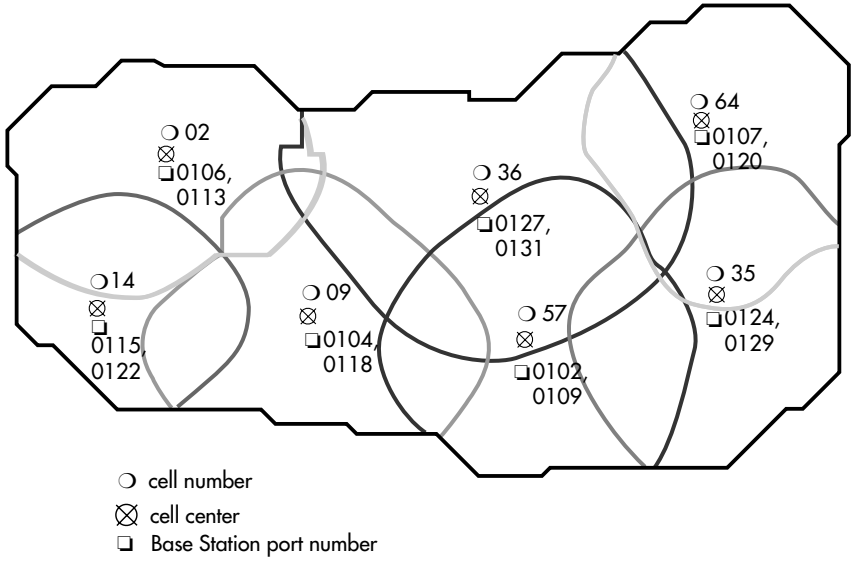
After the system has been activated, verify that it is operating as intended. Use the following list as a guide:

- Verify there are no unusual error log messages. If you see anything other than the normal event messages, refer to Table 44: Event messages in the Administration log, on page 192.
- Verify that all the Base Stations radios are acting properly. They should now be in IDLE or CSC Radio state, if not, see "Troubleshooting a Base Station" on page 177. (See "Verifying Base Station status" on page 78.)
- Determine cell assignments and transcribe these onto the floor plan (see Figure 31 on page 100). See the procedure on page 101.
- Register a test portable, see "Registering and verifying portable telephones" on page 119.
- Enable the RSSI measurement feature. Refer to *Meridian Companion Portable Telephone Registration Instructions* for additional information.

Note: If you cannot establish a connection with a given radio, see "Troubleshooting a Base Station" on page 177.

- Using the floor plan as a guide, walk around the site, trying to pass through each cell while on a call to ensure that hand-off is occurring. Observe the RSSI on the portable display (see your *Meridian Companion Portable Telephone Registration Instructions*). The RSSI value should remain at or above the cell boundary value defined in the *Meridian Companion Site Planning Reference Manual.*

Figure 31 : Floor plan with transcribed information



Note 1: The cell boundary value should be a high-power measurement. An H on the portable's display indicates the portable is transmitting in high-power mode (an L indicates low-power mode).

Note 2: RSSI measurements are displayed as negative values. The smaller the negative value the stronger the signal strength. For example, a signal strength of −60 dBm is stronger than one of −73 dBm.

If a significant area within the coverage area has an RSSI signal strength less than the cell boundary value, refer to *Meridian Companion Site Planning Reference Manual* to redeploy cell centers in the impacted area to fill the gap, or add an additional cell center if necessary.

ATTENTION!

If there is a serious deployment problem, call Northern Telecom Customer Response Center at 1-800-321-2649 to verify that you have approval from UTAM Inc. when initially installing wireless equipment or relocating wireless equipment. If not, note and proceed.

Failure to receive approval prevents you from enabling wireless communication on the Meridian Companion system.

You will need to provide the Companion ID each time you are requesting codes or credits.

A disabled wireless system means that Base Stations and portables are not operational, but registration information is retained. These TCM devices may be reactivated by returning the system to its previous configuration or by entering a UTAM Recovery Code. A new system is activated by entering a UTAM Activation Code.

Viewing radio and cell assignments

This procedure checks the integrity of the programming and should occur immediately after reevaluation.

All radios present on the system should now be assigned to a cell. If any radios are not assigned to a cell, check the Event/Alarm log to see if any Base Stations appear defective. Replace if necessary and repeat the reevaluation.

Check to make sure that Base Stations have been clustered into cells as indicated in the site plan. Add cell numbers and Base Station TCM addresses to the site plan. If there are inconsistencies, check the wiring to make sure that Base Stations are wired to the correct port, that the installation matches the deployment plan, and the site has not changed since the site deployment.

1. Enter Configuration programming.
2. Press [↓] . The display shows `1. Telephony Data` .
3. Press [→] . The display shows `2. Mobility Data` .
4. Press [↓] , then [→] until the display shows `Cells` .

5. Press [↓] , then [→] until the display shows Show cell: .
6. Enter the three-digit number of the first cell to be verified. (You can use BKSP to correct typing mistakes.)

   The display shows Cxxx radios .
7. Press [↓] . The display shows either No radio or ccuun asgnd .
8. Press [→] to see the next radio. Continue pressing the arrow to search through the radios.
9. Press [Rls] to exit or [↑] to continue.

Identifying a radio's cell assignment

To identify a radio's cell assignment:

1. Enter Configuration programming.
2. Press [↓] then [→] until the display shows 2. Mobility Data .
3. Press [↓] . The display shows Re-Evaluation .
4. Press [→] . The display shows Radios .
5. Press [↓] . The display shows Radio credits .
6. Press [→] . The display shows Show radio: .
7. Enter the five-digit number of the radio you want to examine. The display shows Cell Assignment .
8. Press [↓] . The display shows the cell to which this radio is assigned. The display will either show the radio number in cell nn or ccuun not asgned .
9. Press [→] or [←] to search through the cell assignments of other radios.
10. Press [↑] four times to return to 2. Mobility Data .

Configuring the Meridian 1 for the Meridian Companion system

Configuring portable telephones on a Meridian 1 system is similar to setting up 2500 telephones. You need to be familiar with the 2500 set configuration before you configure the Meridian 1 for the Meridian Companion system. If you have never configured 2500 sets on a Meridian 1 system, review the installation procedures in *Meridian 1 System Installation Procedures* before working with Meridian Companion portable telephones.

1. Verify the card status of the Meridian 1 system.
2. Change the ringer default using Table 15.

   The ringer default determines the maximum number of telephones that can be in the ringing state at the same time. For analog phones, change the ringer default from 8 to 16 to ensure that portable telephones ring when receiving incoming calls.

Table 15 : LD 97—Changing the ringer default parameters

Prompt	Response	Meaning
REQ	CHG	change or print peripheral equipment parameters
TYPE	XPE	shelf controller and super loop configuration
XPEC	0, 1-95, xx	assigns shelf controller number
LOC	xxxxxx	location code for shelf controller
MED	<cr>	connection media
RGTP	(8), 16	16 set to concurrent ringers

3. Enable class of service in LD 15.
4. Refer to X11 documentation to determine what release you have.

   Note: For access to Meridian Companion privacy and extended features, you must have X11 release 20B with package 240 installed and enabled.

   If you have X11 release 15 or greater without package 240, follow the instructions on page 104.

   If you have release 20B or greater with package 240, follow the instructions on page 105.
5. Refer to “Programming options” on page 107 for information on the optional programming for different releases. If the customer chooses, the terminal number block (TNB) data can be printed using LD20. LD 81 (for systems running X11 release 20B software) can be used to print a listing of Meridian Companion wireless terminal numbers (WTNs), and LD 95 can be used to change, create, or remove the Call Party Name Display (CPND) name.

   Each portable telephone can have its own business features and class of service. All portable telephones have access to 2500 set features available to wired users. For information on implementing features, refer to *X11 Features and Services*. Refer to *X11 Input/Output Guide* for a complete listing of all prompts associated with each LD.

X11 release 15 or greater without package 240

With X11 releases 15 through 21without package 240 installed, configure the portable telephone as a 2500 set with Class of Service (CLS) set to DTN as shown in Table 16.

Use LD 20 to print the Terminal Number (TN) to verify that the configuration is correct. The portable telephone cannot receive CLID or CPND information. By specifying CLS = MWA, LPA activates the Message Waiting icon for a portable telephone.

Table 16 :LD 10—X11 release 15 or greater without package 240: Configuring a TN for a portable

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	l s c u (Opt. 21-81) l u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	x…x	ODAS telephone designator. Enter one- to six-character alphanumeric ODAS designator.
CUST	0–99	customer number
DIG	<cr>	
DN	xxx…x	directory number
MARP	YES/(NO)	use TN as the MADN redirection prime
CPND		
CLS	DTN	
CLS	XFA THFA	enabling transfer for the Transfer Radio Loss function

X11 release 20B or greater with package 240

Before programming, refer to the list of users in the *Meridian Companion Programming and Provisioning Record* for information needed to set the Multiple Call Arrangement Allowed/Multiple Call Arrangement Denied (MCRA/MCRD) Wireless Privacy feature.

To access Meridian Companion features such as CPND/CLID display and wireless privacy on the Meridian 1 system, package 240 must be installed and enabled, and WRLS set to YES.

If package 240 is not enabled, the WRLS prompt does not appear. CNDA/CNDD and MCRA/MCRD cannot be accepted as values for CLS, and

an error message appears. (LD 83, available with X11 release 20B, prints a list of wireless sets.)

There is one exception to the package 240 requirement: if package 131 is on, MCRA/MCRD is an acceptable CLS value. If the package is not on, use the steps described in "X11 release 15 or greater without package 240" on page 104 to program the Meridian Companion portable telephones.

See Table 16 for the prompts and responses in LD 10 that apply to Meridian Companion. The defaults appear in parentheses and new prompts are bolded in Table 17.

Table 17 : LD 10—X11 release 20B or greater with package 240: Configuring a WTN for a portable

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	l s c u (Opt. 21-81) l u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	d...d	FCC telephone designator
CUST	0–99	customer number
WRLS	**YES/(NO)**	indicates that the TN corresponds to a portable telephone; CLID is enabled as a default
DN	xxx…x	directory number assigned to the portable
CLS	**CNDA/(CNDD)**	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	**MCRA/(MCRD)**	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	digital signaling used by portable telephone (this is the default only if WRLS = YES)
CLS	XFA/(XFD)	enabling transfer for the Transfer Radio Loss function

Wireless telephone privacy

To implement Wireless Privacy for Meridian Companion:

1. Using LD 11, set KEY 0 to NUL (wired line set).
2. Using LD 10, set CLS to MCRA (wireless portable).
3. Using LD 11, set KEY 0 to MCR XXXX (wired line set).

Programming options

Use LD 20 to print Terminal Number Block data as shown in Table 18 and Table 19.

Table 18 : LD 20—X11 releases 15 or greater without package 240: Printing values

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	l s c u	terminal number

Table 19 : LD 20—X11 release 20B with package 240: Printing new values

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	l s c u	terminal number
WRLS	**YES/(NO)**	indicates that the TN corresponds to a portable telephone
CLS	**CNDA/(CNDD)**	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	**MCRA/(MCRD)**	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	default digital signaling used by portable telephone

Use LD 81 to print a list of or count the wireless portable telephones with selected features, that are used on the Meridian Companion system (available only with X11 release 20B or greater). Prompts for LD 81 appear in Table 20.

Table 20 : LD 81—X11 release 20B with package 240: Printing features and station

Prompt	Response	Meaning
REQ	LST, CNT	list or count
CUST	0–99 0–99	one customer or range of customers
DES	d...d	FCC telephone designator
FEAT	**CNDA/ CNDD/ MRCA/ MCRD/ WRLS**	sets with the selected features will be printed or counted

Use LD 81 to print a list of Terminal Numbers or Terminal Number Blocks.

Table 21 : LD 83—X11 release 20B with package 240: Printing TN and TNB

Prompt	Response	Meaning
REQ	LST, TNB	prints list of Terminal Numbers or Terminal Number Blocks in designated order
CUST	x, x–y, <cr>	one customer (x), range of customer numbers (x–y), all customers (<cr>)

Assign names to portables in the CPND data block in LD 95.

Table 22 : LD 95—X11 releases 15–18: Adding, changing, or deleting a CPND name

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	**0–2045 0–99**	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
DCNO	0–254	IDC conversation table number

Table 23 : LD 95—X11 release 19 or later: Adding, changing, or deleting a CPND

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	**0–2045 0–99**	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
_Name	xxxxxxx	name
_XPLN	(16)– 24	expected name length range (between 16 and 24)
_DISPLAY-FMT	**(LAST), FIRS**	**display format for CPND names**

Use LD 73 to define a new data block.

Table 24 : LD 73—X11 release 20B: Defining, changing, or printing a data block

Prompt	Response	Meaning
REQ	NEW/CHG/PRT	New, change, or print
TYPE	PRI2/PRI	PRI data block
FEAT	PAD	Pad category
PDCA	1–16	Pad category table
…	…	
BRIT	Rx Tx	BRI trunk
WRLS	**Rx Tx**	**Meridian Companion** **R = Receive** **T = Transmit** **x = pad value (0–26)**

X11 release 24 with package 350, feature MC32

X11 release 24 with package 350 requires package 240. For information on package 240, see “X11 release 20B or greater with package 240” on page 105.

Feature MC32 enables octal density on Meridian Companion cards.

Table 25 : Card Capacity

Cards	With MC32	Prior to MC32
CMCC	32 Users, 16 Base Stations	16 Users,16 Base Stations
CMLC	32 Users, 0 Base Stations	16 Users, 0 Base Stations
CMRC	32 Users, 16 Base Stations	16 Users, 16 Base Stations
CMBC	0 Users, 16 Base Stations	not available

Table 26 : LD 10—X11 release 24 with package 350: Configuring a WTN for a portable

Prompt	Response	Meaning
REQ	NEW	new telephone
TYPE	500	telephone type
TN	l s c u (Opt. 21-81) l u (Opt. 11)	terminal number
CDEN	4D	quadruple density
DES	d...d	FCC telephone designator
CUST	0–99	customer number
WRLS	YES/(NO)	indicates that the TN corresponds to a portable telephone; CLID is enabled as a default
MWUN	**(16)/32**	changes card density for portable telephones
DN	x...x	directory number assigned to the portable
CLS	CNDA/(CNDD)	user can see the name associated with the number dialed if CPND is set up for the customer
CLS	MCRA/(MCRD)	Multiple Call Arrangement Allowed (privacy)/Multiple Call Arrangement Denied (no privacy)
CLS	(DTN)	digital signaling used by portable telephone (this is the default only if WRLS = YES)
CLS	XFA/(XFD)	enabling transfer for the Transfer Radio Loss function
CLS	THFA/(THFD)	enabling transfer across analog trunks

Note: For system upgrades

If any TN on a Companion card is datafilled with the WRLS prompt set to “no”, you will need to remove “out” all the TNs on the card and redatafill them with the WRLS prompt set to “yes”. If the WRLS prompt for all the TNs on a card are set to “yes”, change the MWUN prompt from “16” to “32” and datafill TNs 16 to 31.

Table 27 : LD 20—X11 release 24 with package 350: Printing values

Prompt	Response	Meaning
REQ	PRT	to print information
TYPE	500	telephone type
TN	l s c u	terminal number

Use LD 81 to print a list of the wireless portable telephones used on the Meridian Companion system (available only with X11 release 20B or greater). Prompts for LD 81 appear in Table 20.

Use LD 81 to print a list of Terminal Numbers or Terminal Number Blocks in designation (DES) order.

Table 28 : LD 81—X11 release 24 with package 350: Printing TN and TNB

Prompt	Response	Meaning
REQ	LST, TNB	prints list of Terminal Numbers or Terminal Number Blocks in designated order
CUST	x, x–y, <cr>	one customer (x), range of customer numbers (x–y), all customers (<cr>)
DES	d...d	FCC telephone designator
New information to be printed:		
WRLS	YES/(NO)	indicates that this TN corresponds to a portable personal telephone
MWUN	**(16)/32**	changes card density for portable telephones
CLS	CNDA/(CNDD)	prints new CLS for WRLS
	MCRA/(MCRD)	Multiple Call Arrangement Allowed (privacy)/ Multiple Call Arrangement Denied (no privacy)
	DTN	default digit signaling used by portable personal telephone

Assign names to portables in the CPND data block in LD 95.

Table 29 : LD 95—X11 releases 15–18: Adding, changing, or deleting a CPND name

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	0–2045 0–99	existing Dial Intercom Group and member number
DN	xxxx	existing DN of eligible type
DCNO	0–254	IDC conversation table number

Table 30 : LD 95—X11 release 19 or later: Adding, changing, or deleting a CPND

Prompt	Response	Meaning
REQ	NEW/CHG/OUT	add, change, or delete a name
TYPE	NAME	CPND name
CUST	0–99	customer number
DIG	0–2045 0–99	existing Dial Intercom Group and member number
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names
DN	xxxx	existing DN of eligible type
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names
DCNO	0–254	IDC conversation table number
_DISPLAY-FMT	(LAST), FIRS	display format for CPND names

Use LD 73 to define a new data block.

Table 31 : LD 73—X11 release 20B: Defining, changing, or printing a data block

Prompt	Response	Meaning
REQ	NEW/CHG/PRT	New, change, or print
TYPE	PRI2/PRI	PRI data block
FEAT	PAD	Pad category
PDCA	1–16	Pad category table
…	…	
BRIT	Rx Tx	BRI trunk
WRLS	Rx Tx	Meridian Companion R = Receive T = Transmit x = pad value (0–26)
MWUN	**(16)/32**	changes card density for portable telephones

Table 32 : LD73 Overlay 10 Error Messages

Prompt	Meaning
SCH0334	**wireless and wireline sets have been provisioned on the same line card**
SCH0810	**incompatible wireless card density**

Programming user options

You can program the feature that controls call transfer on radio loss through the Administration Terminal or through Companion Manager. This section explains how to program the feature through the Administration Terminal. For information about programming this feature through Companion Manager, refer to *Companion Manager Installation and Operations Guide*.

Programming Call Transfer on Radio Loss

If a portable telephone user moves beyond radio range or if the battery in the portable telephone becomes weak, the call may be dropped. To keep calls from terminating abruptly, program the system so that it transfers dropped calls to another number.

There are three values for Transfer on Radio Loss:

- **None** (the default): Calls are not transferred.
- **Dflt**: Calls are transferred to the default for the system, for example, a receptionist.
- A specific number: Calls are transferred to the specified number, for example, an answering machine.

Note: There can be a delay of about 10 seconds between the time that the link is lost and the time that the call is transferred.

Programming a system default for radio loss handling

To program a system default telephone number for transferring a call on radio loss, enter an Administration programming session and do the following:

1. Press Feature * * 9 and enter the Administration password.

   The display shows `1. Registration` .

2. Press → . The display shows `2. User Options` .
3. Press ↓ . The display shows `Radio loss hdlng` .
4. Press ↓ to specify a default telephone number. The display shows `Change Default` .
5. Press ↓ . The display shows the default number or `None` .
6. Press CHANGE .
7. Enter up to 16 digits for the default phone number using 0 to 9 and *. The * will add a two second pause. Use BKSP for corrections
8. Press OK to confirm the telephone number. The display shows `Change Default` .
9. Press Rls to exit.

Programming individual Transfer on Radio Loss

To program an individual telephone number for transferring a call on radio loss, enter an Administration programming session and do the following:

1. Press Feature * * 9 and enter the Administration password.

   The display shows `1. Registration` .

2. Press → . The display shows `2. User Options` .
3. Press ↓ . The display shows `Radio loss hdlng` .
4. Press ↓ to specify a default telephone number. The display shows `Change Default` .
5. Press → . The display shows `Change WTN:` .
6. Enter the WTN. The display shows `Wccuu:` .

7. Press CHANGE to specify a new telephone number or press DFLT to specify the default telephone number. Enter up to 16 digits for the default phone number using 0 to 9 and *. The * will add a two second pause. The DFLT key label appears only if a default telephone number has previously been specified. Use BKSP for corrections.

8. Press OK to confirm the telephone number. The display shows Wccuu followed by the number.

9. Press [→] to go to the next WTN.

   Note: If OK is pressed and no digits have been entered, the telephone number is deleted and Wccuu: None appears in the display. Go back to step 5.

Registering and verifying portable telephones

To register portable telephones to a system, you use the Administration Terminal or Companion Manager together with the portable.

This section describes registration and verification using the Administration Terminal. For information about how to register portables using Companion Manager, see the *Companion Manager Installation and Operations Guide*. For more information about the Administration Terminal, refer to the *Meridian Companion Administration Terminal Operations Guide*.

You can use the Administration Terminal to perform the following functions:

- enable registration (no portable telephones can be registered unless the system registration is enabled)
- check the status of each WTN
- deregister a WTN due to portable telephone loss or breakage
- check to make sure that sufficient credits are available

Before a portable will operate, it must be registered with the system. Ensure that you are within range of a functioning Base Station when you register the portables.

Note: Each time a portable is registered, the number of available Portable Credits decreases by one. If a portable is deregistered, the number of available credits increases by one. See “Activating wireless communications” on page 93 for additional information.

When you distribute the portables, inform the users that the portables are registered and give them the corresponding slot numbers. Portables can be registered to a maximum of nine different Companion systems.

To register the portables you perform the following:

- Enable registration for the Meridian Companion system and ensure there are sufficient credits.
- Register the portables.
- Verify the operation of each portable.
- Disable registration for the Meridian Companion system.

Enabling and disabling registration

You must enable registration for the entire Meridian Companion system to allow individual portables to register. The options are Yes (Y) and No (N). Yes indicates that Master Registration is enabled. No is the default and indicates that Master Registration is not enabled.

Note: To prevent interference problems with neighboring systems, set the Master Registration to N when the portables are no longer being registered.

1. Press Feature * * 9 and enter the Administration password. The display shows `1. Registration` .
2. Press ↓ . The display shows `Mstr Reg Enbl:` followed by the currently set Master Registration setting, Y or N .
3. To change to the other setting, press CHANGE .
4. To continue in Administration programming, press → , or to exit, press Rls to exit.

Locking Registration on (optional)

`Mstr Reg Enbl:` automatically returns to N 30 minutes after the last registration. It is recommended that you allow Registration to time out in most circumstances. Leaving Registration enabled can interfere with registration in neighboring systems. However, if you are registering a large number of portables and do not want registration to time out, you can lock it on.

1. On the Administration Terminal, press Feature * * 9 . The display shows `Password:` .
2. Enter the Administration password (default password is 9 9 9 9). The display shows `1. Registration` .
3. Press ↓ until the display shows `Mstr Reg Enbl:` .
4. If required, press CHANGE until the display shows `Mstr Reg Enbl:Y` .
5. Press → until the display shows `Reg Locked: N, Y`

Press CHANGE until the display shows `Reg Locked: Y`.

Registering portable telephones

Refer to *Meridian Companion Portable Telephone Registration Instructions* for additional information.

Verifying a portable telephone's operation

After you register a portable you should

- verify the WTN
- verify the portable can make or receive calls
- conduct a signal strength test
- verify any optional features

To verify the WTN:

1. Open the portable flap.
2. Press Feature . The display shows `FEATURE LIST` .
3. Press ▽ or △ until the display shows `Feature request` .
4. Press SELCT . The display shows `A-` .
5. Press * 0 . The display shows the WTN for three seconds.

To verify the portable can make or receive calls:

1. Verify that the portable telephone has a dial tone. (Ensure that the portable telephone's twinned desk telephone, if any, is idle.)

2. From another telephone, dial the directory number that maps to the registered WTN.

   If the portable telephone rings, it is functioning properly.

   If the portable telephone does not ring, check the Meridian 1 programming to ensure that the WTN has the proper directory number assignment.

To conduct a signal strength test establish a connection with a radio, first ensure that you get a connection with the same radio. To do so, use Directed RSSI and measure the Receive Signal Strength Indicator (RSSI) level (see the user guide for the portable telephone for instructions on connecting to the radio). Replace any portable telephone whose reading is significantly different from the others.

Note: An RSSI value of -35 dBm is the strongest (best) possible signal strength. As the signal fades, the absolute value of the RSSI number increases. The link drops as the value approaches -100 dBm.

Optional checks

If Transfer on Radio Loss has been programmed, verify that it is operating properly:

1. From another telephone, make a call to the portable telephone.
2. Remove the batteries and wait 10 seconds for the link to drop.

After the 10 seconds of silence, the calling telephone should hear ringback and the destination phone should ring, indicating the call has been transferred.

If the portable telephone does not appear to be operating correctly, see Table 41: Troubleshooting portable telephones, on page 181.

Verifying Portable Credits

To verify the number of Portable Credits:

1. Enter Configuration programming.
2. Press [→] . The display shows `B. Administration` .
3. Press [↓] . The display shows `1. Registration` .
4. Press [↓] . The display shows `Mstr Reg Enbl:` .

5. Press CREDITS . The display shows nnn Available and nnn Total . Verify that the total number of Portable Credits is correct.

Note 1: Initially, the Total credits will equal the Available credits since you have not yet registered any of the portables. As you register each portable to the system, the number of available Portable Credits decreases by one.

Note 2: If the total number of Portable Credits is not enough for the system, you may need to obtain additional credits.

Deregistering the WTN

Refer to *Meridian Companion Administration Terminal Operations Guide*.

Maintenance

This section includes information on the following:

- maintenance commands associated with the Meridian 1 system
- maintenance commands associated with the Meridian Companion Administration Terminal
- system failures (exceptions)
- alarm and event descriptions and actions
- hardware maintenance actions

Using maintenance commands

A number of commands in LD 32 can be used to examine Meridian Companion from the perspective of the Meridian 1 system. The Meridian Companion Administration Terminal can be used to examine the Meridian Companion system components to determine that they function properly.

Meridian 1 card maintenance

Table 33 shows commands available in LD 32 for the CMCC, CMRC, CMLC, and CMBC. For additional information on these commands, refer to *X11 Input/Output Guide*. Some of the commands vary slightly for Option 11 systems (refer to Option 11 documentation).

Table 33 : Maintenance and diagnostic commands in LD 32

Commands	System responses	Description
STAT l s	shows status	indicates whether unit is idle, busy, or disabled
STAT (loop)	shows status	indicates status of loop
STAT l s c	shows status	indicates status of specified card
STAT l s c u	shows status	indicates status of specified unit
ENLC l s c	enables card	enables the specified card
ENLL loop	enables loop	enables network loop
ENLN loop	enables card	enables network card with specified loop
ENLS l s	enables shelf	enables specified shelf
ENLU l s c u	enables unit	specified unit enabled
DISC l s c	disables card	removes specified card and associated TNs from operation
DISI l s c	disables card	disables specified card when it becomes idle
DISL loop	disables loop	disables network loop
DISN loop	disables network card	disables network card containing specified loop
DISS l s	disables shelf	disables all cards on specified shelf
DISU l s c u	disables unit	disables specified unit

Administration Terminal maintenance commands

Maintenance programming enables you to monitor and control Meridian Companion operation at a hardware component level: system, card, WTN TCM device.

All maintenance functions described in this section start at the Maintenance menu. To access the Maintenance menu through the Administration Terminal

1. Press Feature * * 0 . The display shows `Password:` .
2. Enter the Installer password. The display shows `A. Configuration` .
3. Press → until the display shows `C. Maintenance` .

   Six features can be accessed at this point. See the following section for a description of each.
4. To end a session, press Rls .

To access maintenance functions through Companion Manager, refer to *Companion Manager Installation and Operations Guide*.

Maintenance features

There are six features in the maintenance menu.

- system status
- card status
- WTN status
- TCM status
- Event/Alarm log
- Administration log

The first four features are typically used when a problem or a system change occurs. The two log features should be used to verify, record, and clear the corresponding logs periodically.

The softkeys common to many of these tasks are labeled ENBL (enable) and DSBL (disable). The confirming messages associated with the DSBL key are

Disable at once? and Disable at idle? . The softkey appears only when the state is Busy or Wait Idle .

The following maintenance tasks can be performed using the Administration Terminal, as shown, or Companion Manager. For Companion Manager instructions, refer to *Companion Manager Installation and Operations Guide*.

System Status

The System Status feature enables you to check the system type and state and perform system level maintenance actions.

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press → until the display shows C. Maintenance .
3. Press ↓ . The display shows 1. System Status .
4. Press ↓ . The display shows the product name (MC) and protocol (PCI).
5. Press STATE to see the operational state of the system, described in Table 34.
6. Press TYPE at any point to reset the display to show the product name and protocol, as indicated in step 4.
7. Press ↓ to see the software version and release number.
8. Press Rls to exit, or ↑ to continue in Maintenance programming.

Note: The system can be disabled if the state is Busy , Failed , Idle , or Wait Idle . Pressing DSBL shows Disable at once? on the display. You can select either YES (the system enters the Disabling state), or CHANGE (you are asked whether to disable upon idle; a YES response places the system in the Wait Idle state).

Table 34 : System states and actions

State	Meaning	Possible action
Idle	system is enabled but not in use (no active calls or links)	DSBL or TYPE
Disabling	Meridian Companion system is being disabled due to system or user action	TYPE
Enabling	system is being enabled following installation or a reset	TYPE
Busy	system is in use	[↓] to see the number of busy WTNs, [↓] then [→] to see the number of TCM devices, DSBL , or TYPE
Wait Idle	All idle WTNs and TCM devices have been disabled; active WTNs and TCM devices will be disabled as soon as calls terminate.	DSBL to disable immediately; [↓] to see the number of busy WTNs, [↓] then [→] to see the number of TCM devices; otherwise, TYPE
Dsbl Sys	All system WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
Dsbl User	All system WTNs have been disabled by the user.	ENBL to reenable, or TYPE

Card Status

The Card Status feature enables you to check the card type and state and perform card level maintenance actions.

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration, press → until the display shows C. Maintenance .
3. Press ↓ , then press → until the display shows 2. Card Status .
4. Press ↓ . The display shows Show card .
5. You can enter a number or press ↓ to see the first card. The display shows Cnn: followed by the card type: CMCC , CMRC , CMLC, or CMBC.
6. Press ↓ to see the firmware version of the current card.
7. Press STATE to see the card state described in Table 35.

   Note: Pressing TYPE at any point resets the display to show the card number and type, as indicated in step 5.

8. Press → and ← to view other cards.
9. Press Rls to exit, or ↑ to continue in Maintenance programming.

   Note: The card can be disabled if the state is Busy , Failed , Idle , or Wait Idle. Pressing DSBL shows the question Disable at once? on the display. You can select either YES (the card enters the Disabling state), or CHANGE (you are asked whether to disable upon idle; a YES response places the card in the Wait Idle state).

Table 35 : Card states and actions

State	Meaning	Possible action
Idle	card is enabled but not in use	TYPE
Enabling	card is being enabled	TYPE
Disabling	card is being disabled	TYPE
Failed	TCM device has failed	DSBL takes failed TCM device offline and sets the state to Dsbl User; verify power and wiring
Unequipped	No operational card is in this slot; normally this appears only if the slot is empty during a disable/enable process.	DSBL
Busy	card is in use	↓ to see the number of busy WTNs, ↓ then → to see the number of TCM devices, DSBL , or TYPE
Wait Idle	All idle WTNs and TCM devices are immediately disabled; remaining WTNs and TCM devices will be disabled as soon as calls terminate.	DSBL to disable immediately; ↓ to see the number of busy WTNs, ↓ then → to see the number of TCM devices; otherwise, TYPE
Dsbl Sys	All card WTNs and TCM devices have been disabled due to a system detected exception.	treat exception that caused system to become disabled
Dsbl User	All card WTNs have been disabled by the user.	ENBL to reenable, or TYPE

Wireless Terminal Number (WTN) Status

The WTN Status feature enables you to check the WTN type and status. There are no maintenance actions available because they can be performed from the Meridian 1 side.

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press → until the display shows C. Maintenance.
3. Press ↓ , then press → until the display shows 3. WTN Status .
4. Press ↓ . Enter the WTN.
5. You can enter a number or press ↓ to see the first WTN. The display shows W followed by the four-digit WTN and the WTN type.
6. Press STATE to see the WTN state as shown in Table 36.

   Note: Pressing TYPE at any point resets the display so it shows the card number and type as indicated in step 3.

7. Use → and ← to view other WTNs.
8. Press Rls to exit or ↑ to continue in Maintenance programming.

Table 36 : WTN states and actions

State	Meaning	Possible action
Idle	The WTN is enabled but not in use.	TYPE
Disabling	The card is in the process of being disabled.	TYPE
Failed	The WTN module has failed.	handle at card level
Busy	The WTN is in use.	TYPE
Wait Idle	The card has been disabled when idle. This WTN still has an active call. It will be disabled as soon as the call terminates.	handle at card level
Maint	The WTN has been disabled from the Meridian 1 side.	After the Meridian 1 system enables the WTN, the state becomes Idle or Busy.
Dsbl User	All WTNs have been disabled by user.	handle at card level
Dsbl Sys	All WTNs have been disabled by system.	treat exception that caused WTN to become disabled

TCM Status

The TCM Status feature enables you to check the TCM device type and status and perform TCM level maintenance actions.

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration, press → until the display shows C. Maintenance.
3. Press ↓ , then press → until the display shows 4. TCM Status .
4. Press ↓ . The display shows Show TCM: .
5. You can enter a TCM device number or press ↓ to see the first TCM device.

   The display shows T followed by the five-digit TCM device port number and the TCM device type: BS-1 (Base Station), RAD , or 7310 (M7310 Administration Terminal).
6. If the TCM device has associated software or firmware, you can press ↓ to see the version of the software/firmware. (If there is no software/firmware, the ↓ button does not appear.)
7. Press STATE to see the TCM device state as shown in Table 37.

   The TCM device can be disabled if the state is Idle , Busy , Failed , Maint , CSC Radio , Equipped , or Wait Idle . Pressing DSBL shows Disable at once? on the display. You can select YES (the TCM device enters the Disabling state), CHANGE (you are asked whether to disable upon idle; a YES response places the TCM device in the Wait Idle state), or TYPE .

   Note: Pressing TYPE at any point resets the display so it shows the TCM device number and type as indicated in step 5.
8. Press → or ← to view other TCM devices.
9. Press Rls to exit or ↑ to continue in Maintenance programming.

   Note: The Administration Terminal cannot be disabled.

Table 37 : TCM device states and actions

State	Meaning	Possible action
Idle	TCM device is enabled but not in use	TYPE
Disabling	TCM device is being disabled	TYPE
Enabling	TCM device is being enabled following installation or a reset	TYPE
Failed	TCM device has failed	DSBL takes the failed device offline and sets the state to Dsbl User.
Equipped	will display for RAD or 7310 TCM	DSBL
Unequipped	No TCM device has ever been associated with the port number (type = NONE).	The state becomes Idle or Busy when a TCM device becomes associated with the port number.
Busy	TCM device is in use	DSBL or TYPE
Wait Idle	TCM device will be disabled as soon as current traffic terminates	DSBL to disable immediately; TYPE
Maint	TCM device is not in normal operating mode (the Base Stations are not configured into cells, or they are downloading new software, or CDS is running)	configure using the Mobility Data programming features
CSC Radio	A radio is in use as a common signalling channel. There is one radio per cell designated as a CSC radio.	DSBL or TYPE
Dsbl User	user has disabled TCM device	ENBL or TYPE
Dsbl Sys	system has disabled TCM device	treat exception that caused TCM device to become disabled

Event/Alarm log

Status (alarm and event) messages appear on the display and are stored in the Event/Alarm log.

Alarms indicate important and sometimes abnormal system conditions. The details of every alarm, including date and time, should be noted as soon as possible, and the alarm cleared. Alarms may require some action to clear.

With the Event/Alarm log, you can

- check alarms and events that have occurred
- check when alarms and events occurred
- check a current alarm
- check the number of consecutive occurrences of an event or an alarm
- erase the log

ATTENTION!

Because the Event/Alarm log holds a maximum of 50 events, you should check and record these alarms and events periodically. Erase the log after dealing with the alarms and events. If your system is also equipped with Companion Manager, these logs can be printed as a report.

When the log is full, alarms are replaced with new alarms of higher priority.

Each event is assigned a severity number. An S preceding this number (for example, S4) may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

If an event or alarm occurs while you are using the Administration Terminal for programming, your session will not be disrupted. Instead, the alarm message and beep will occur after the programming session ends.

The Event/Alarm log indicates what alarms and events occurred, when they occurred, and how many times they occurred.

Entering the Event/Alarm log

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration, press → until the display shows C. Maintenance .
3. Press ↓ , then press → until the display shows 5. Evnt/Alrm Log .
4. Press ↓ . The display shows Start of new log or Start of log .
5. Press → or ← to search through alarms and events in the log.
6. Press ↑ twice to continue in Maintenance programming.

Checking the most recent alarm

1. Enter the Event/Alarm log.
2. Press ALARM . The display shows an alarm code if there is an uncleared alarm, or No current alarm .
3. Press EXIT to return to the Event/Alarm log, or press OK if an alarm message was displayed.

Checking when an alarm or event occurred

1. Enter the Event/Alarm log.
2. Press → or ← to search through the alarms and events in the log.
3. Press TIME . The display shows the date and time that the alarm or event last occurred, then returns to the alarm.

Checking consecutive repetitions of an alarm or event

1. Enter the Event/Alarm log.
2. Press [→] or [←] to search through the alarms and events in the log.
3. Press REPEAT . The display shows the number of consecutive times that the alarm or event occurred, then returns to the previous display.

Erasing the log

1. Enter the Event/Alarm log.
2. Press ERASE . The display shows Erase log?.
3. Press YES . If no new alarms or events have been added since the list was entered, the log is erased and the display shows Log is empty , then 5.Evnt/Alrm Log . If new alarms or events have been added since the list was entered, the display shows Log has changed .

Administration log

The Administration log lists event messages for administrative events such as system initialization, Configuration sessions in which a change was made, invalid password attempts, and password changes. By using this feature you can

- check what events occurred
- check when the events occurred
- check the number of consecutive occurrences of an event
- erase the log

ATTENTION!

Because the Administration log holds a maximum of 10 events, you should verify and record these events periodically. Erase the log after dealing with the events. If your system is also equipped with Companion Manager, these logs can be printed as a report.

Each event is assigned a severity number. An S preceding this number (for example, S4) may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

Entering the Administration log

1. Press Feature * * 0 and enter the Installer password.
2. From A. Configuration , press → until the display shows C. Maintenance .
3. Press ↓ , then press → until the display shows 6. Admin Log .
4. Press ↓ . The display shows Start of new log or Start of log .

5. Press ALARM . The display shows an alarm code if there is a current alarm.
6. Press → or ← to search through events in the log.
7. Press TIME to see the date and time of an alarm's most recent occurrence.
8. Press REPEAT to see how many times the alarm has occurred.
9. To erase the log, press ERASE .

   Note: If new alarms have occurred since the log was accessed, the display shows Log has changed . Otherwise, the display shows Log is empty .

10. Press ↑ to continue in Maintenance programming.

Checking when an event occurred

1. Enter the Administration log.
2. Press → or ← to search through the events in the log.
3. Press TIME . The display shows the date and time that the event last occurred, then returns to the previous display.

Checking the most recent alarm

1. Enter the Administration log.
2. Press ALARM . The display shows an alarm code if there is an uncleared alarm, or No current alarm (see Table 42 on page 183).

Checking consecutive repetitions of an event or alarm

1. Enter the Administration log.
2. Press → or ← to search through the events in the log.
3. Press REPEAT . The display shows the number of consecutive times that the event or alarm occurred, then returns to its previous display.

Erasing the Administration log

1. Enter the Administration log.
2. Press ERASE . The display shows Erase log? .
3. Press YES . If no new events have been added since the list was entered, the log is erased and the display shows Log is empty , then 6.Admin Log . If new events have been added since the list was entered, the display shows Log has changed .

Responding to event and alarm messages

The alarm messages are displayed on the Administration Terminal. This is an example of an alarm message:

```
Alarm: 51-04
TIME CLEAR
```

Report the alarm and the time it occurred to your installer or distributor.

Responding to an alarm code

Alarm codes can take up to two minutes to be displayed on the Administration Terminal. If the system was turned off when the failure occurred, the alarm code appears two minutes after the system is turned on.

When you see an alarm code, follow these steps:

1. Record the alarm code.
2. To see when the alarm occurred, press TIME .
3. To clear the alarm, press CLEAR .
4. Determine the cause of the alarm using Table 42 on page 183.

System Reevaluation

ATTENTION!

Unless this is a new installation, System Reevaluation disables the Meridian Companion system and should be performed after hours.

All active calls will be dropped when System Reevaluation begins.

When the physical system configuration has changed significantly, such as a Base Station layout, you must run System Reevaluation so that the Meridian Companion system can adapt to the changes and provide optimum performance.

You will usually be notified when System Reevaluation is required (see explanation below).

You should run System Reevaluation when

- new Base Stations have been added
- the system has been relocated
- antenna settings have been changed

Keep these points in mind:

- If the system detects the need for System Reevaluation, you will see `Re Eval required` or `Re-Eval recommended` on the Administration Terminal. If reevaluation is recommended (and not required), you can clear the message if the system is unchanged, for example, if a faulty Base Station has been replaced.
- If `Re-Eval recommended` is displayed, it could be for the following two reasons:
  - — a Base Station had lost power, or the TCM port had been disconnected and is now back in service
  - — a Base Station has been replaced by another Base Station but the port has not changed

- If the antenna setting for a radio changes, System Reevaluation will be required.
- If a Base Station is removed or added while System Reevaluation is running, the reevaluation procedure will take twice as long to complete.

ATTENTION!

System Reevaluation must be performed for the new configuration to take effect.

ATTENTION!

If you modify the Base Station configuration and repower the system before you execute a System Reevaluation, then a "UTAM test failed" alarm will be displayed and the system will disable wireless communication. See Table 42 on page 183.

To run System Reevaluation, follow these steps:

1. Press Feature * * 0 and enter the Installer password. The display shows A. Configuration.
2. Press ↓ . The display shows 1. Telephony Data .
3. Press → .. The display shows 2. Mobility Data .
4. Press ↓ . The display shows Re-Evaluation .
5. Press ↓ . The display shows Re-Eval status .
6. Press ↓ . The display shows one of the following:

Message	Meaning	Action
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	Continue with step 7.

Message	Meaning	Action
Re-Eval not req.	The Meridian Companion system did not detect the need for System Reevaluation.	Continue with step 7 if desired.
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	at the installer's discretion: • continue with step 7 • schedule a re-evaluation • CLEAR to continue without running System Reevaluation
Re-Eval in prog.	The Meridian Companion system is currently running System Reevaluation.	Press RIs to exit and wait for display to show Re-Eval complete.
Re-Eval disabled	The Meridian Companion system has determined that System Reevaluation is not available at this time because the mobility has been disabled.	See either UTAM test failed alarm or UTAM code req'd alarm in Table 42: Alarm troubleshooting, on page 183.
Re-Eval pending	System Reevaluation was requested but has not yet started.	Press RIs to exit and wait for display to show Re-Eval in prog., Re-Eval complete .

7. Press CONTINUE . The display shows Re-Evaluate now? .
8. If you want to run System Reevaluation later, press NO and see "Setting a scheduled time or date" on page 146.

If you want to run System Reevaluation now, press YES . The display shows Calls will drop .

To exit with no impact, press Rls or CANCEL .

ATTENTION!

System Reevaluation cannot be canceled once initiated.

9. Press EXECUTE . The display shows Re-Eval pending .
10. Press Rls to exit. Re Eval in prog. is displayed.
11. The display shows Re Eval complete when the reevaluation procedure is completed. Press CLEAR to clear the message.

Note 1: You may receive alarm messages during this process, see "Responding to an alarm code" on page 141 for more information.

Note 2: Base Station download will increase the time by approximately 10 minutes.

Approximate run times for System Reevaluation are shown in the following table:

# Base Stations	Reevaluation run time (minutes)
20	6
40	14
60	19
80	23
100	28
120	32
>120	>34

Scheduling System Reevaluation

You can view the scheduled time for System Reevaluation or schedule a time to run System Reevaluation.

Verifying the scheduled time

1. Press Feature * * 0 and enter the Installer password. The display shows `A. Configuration`.
2. Press ↓ . The display shows `1. Telephony Data` .
3. Press → . The display shows `2. Mobility Data` .
4. Press ↓ . The display shows `Re-Evaluation` .
5. Press ↓ . The display shows `Re-Eval status` .
6. Press → . The display shows `Re-Eval schedule` .
7. Press ↓ . The display shows the time and date when System Reevaluation has been scheduled, or the display shows `Not scheduled` .
   - — If the time and date displayed are correct, press ↑ three times to continue in Configuration programming.
   - — To schedule System Reevaluation or change the scheduled time, go to step 2 of “Setting a scheduled time or date”.
   - — To cancel a scheduled System Reevaluation, press CANCEL .

Setting a scheduled time or date

Note: The system accepts only a date and time set later than the current date and time.

1. Complete steps 1 to 7 of “Verifying the scheduled time”.
2. Press CHANGE . The display shows `Calls will drop at set time` followed by the current scheduled hour, or `0:01` if a time has not been scheduled.

   If you do not want to change the scheduled time, go to step 4.
3. To schedule the time, press CHANGE . The display shows `Hour:` followed by the current scheduled hour (`00` if none scheduled).

a. Press CHANGE . The display shows Hour: . If you do not want to change the hour, go to step 3c.

b. Enter the hour in 12-hour or 24-hour format, as one or two digits.

c. Press [→] . The display shows Minutes: followed by the current scheduled minutes (01 if none scheduled). If you do not want to change the minutes, go to step 3f.

d. Press CHANGE . The display shows Minutes: .

e. Enter the minutes as one or two digits.

f. Press [→] . If you entered an hour less than or equal to 12, the display prompts you with AM or PM . If you entered an hour greater than 12, go to step 4a to set the date or go to step 5 to continue in Configuration programming.

g. Press CHANGE to select AM or PM.

4. To schedule the date, press [→] . The display shows Date followed by the current scheduled date (today's date if none scheduled).

   If you do not want to change the scheduled date, press [↑] four times to continue in Configuration programming. (You may hear a beep after the first [↑] .)

   To continue scheduling the date

   a. Press CHANGE . The display shows Year: followed by the currently scheduled year. If you do not want to change the year, go to step 4d.

   b. Press CHANGE . The display shows Year: .

   c. Enter the last two digits of the year.

   d. Press [→] . The display shows Month: followed by the current scheduled month. If you do not want to change the month, go to step 4g.

   e. Press CHANGE . The display shows Month: .

   f. Enter the month as one or two digits between 1 and 12.

   g. Press [→] . The display shows Day: followed by the current scheduled day. If you do not want to change the day, go to step 5.

   h. Press CHANGE . The display shows Day: .

i. Enter the day of the month as one or two digits between 1 and 31.

5. Press [↑] three times to continue in Configuration programming. (You may hear a beep after the second [↑] .)

Modifying your system

Adding Portable Credits

You must purchase credits first, confirm your order before proceeding.

To register additional portables, you must obtain Portable Credit Codes for the number of portables you need. These codes are then entered into the system to apply the credits. You can obtain additional Portable Credit Codes whenever you need to expand the number of portables, up to a maximum of

- 480 portables on an Option 21–81 release 24 system with package 350
- 320 portables on an Option 11 release 24 system with package 350
- 240 portables on Option 21 through Option 81 systems
- 160 portables on an Option 11 system

Note: You must ensure that the system has the required hardware to support the number of portables to be registered.

To obtain Portable Credits

1. Confirm order.
2. Call Northern Telecom Customer Response Center (1-800-321-2649)to get a Portable Credit Code to increase the number of portables you can register to a system.

   You will need to provide the Companion ID, the site zip code, and the SSN.

   Note: The Companion ID and the SSN should be recorded in *Meridian Companion Programming and Provisioning Record*. If the SSN is not recorded, you can do so following step 7.

3. Record the Portable Credit Code in *Meridian Companion Programming and Provisioning Record*.

4. Press Feature * * 0 and enter the Installer password. The display shows A. Configuration.
5. Press ↓ .
6. Press ← . The display shows 4. Software Codes .
7. Press ↓ . The display shows SSN:nnnnnnnn .
8. Press → . The display shows Codes .
9. Press ↓ . The display shows Code 1: . Enter the first code number. Use BKSP for corrections.
10. Press OK . The display shows Code 2: . Enter the second code number.
11. Press OK . The display shows Code 3: . Enter the third code number.
12. Press OK . The display shows Entry Successful , then Codes .

    Note: If the code entry is unsuccessful, the display shows Invalid code. If this happens, reenter the code or call Northern Telecom Customer Response Center for assistance (1-800-321-2649).

13. Follow the procedure "Verifying Portable Credits" on page 122 or press Rls to exit.

Adding Radio Credits

Radio Credits must have been ordered before you can proceed with the following procedure.

To increase the number of Radio Credits assigned to a system, you must obtain a UTAM Activation Code for the number of Radio Credits you require. The code is then entered into the system.

To modify Radio Credits

1. Call Northern Telecom Customer Response Center (1-800-321-2649) to get a UTAM Activation Code to change the number of Radio Credits assigned to a system.

   You will need to provide the Companion ID, the site zip code, and the SSN.

   Note: The Companion ID should be recorded in *Meridian Companion Programming and Provisioning Record*.

2. Record the UTAM Activation Code in *Meridian Companion Programming and Provisioning Record*.
3. Press Feature * * 0 and enter the Installer password. The display shows A. Configuration.
4. Press ↓ then press ← . The display shows 4. Software Codes .
5. Press ↓ . The display shows SSN:nnnnnnnn .
6. Press → . The display shows Codes .
7. Press ↓ . The display shows Code 1: . Enter the first code number. Use BKSP for corrections.
8. Press OK . The display shows Code 2: . Enter the second code number.
9. Press OK . The display shows Code 3: . Enter the third code number.
10. Press OK . The display shows Entry Successful , then Codes .

    Note: If the code entry is unsuccessful, the display shows Invalid code . If this happens, reenter the code or call Northern Telecom Customer Response Center (1-800-321-2649) for assistance.

11. Follow the procedure "Verifying Radio Credits" on page 182 or press Rls to exit.

Activating a disabled system

A disabled wireless system implies that Base Stations and portables are not operational.

A disabled system could occur after a power interruption to the system (see alarm UTAM test failed in Table 42 on page 183 for more information). If performing the actions described in Table 42 does not correct the problem, a UTAM Recovery Code will be required to bring the system back online.

To obtain and enter a code

1. Call Northern Telecom Customer Response Center (1-800-321-2649) to get a UTAM Recovery Code.

You will need to provide the Companion ID, the site zip code, and the SSN.

Note: The Companion ID should be recorded in *Meridian Companion Programming and Provisioning Record*.

2. Record the UTAM Recovery Code in *Meridian Companion Programming and Provisioning Record*.
3. Press Feature * * 0 and enter the Installer password. The display shows `A. Configuration`.
4. Press ↓ then press ← . The display shows `4. Software Codes` .
5. Press ↓ . The display shows `SSN:nnnnnnnn` .
6. Press → . The display shows `Codes` .
7. Press ↓ . The display shows `Code 1:` . Enter the first code number. Use BKSP for corrections.
8. Press OK . The display shows `Code 2:` . Enter the second code number.
9. Press OK . The display shows `Code 3:` . Enter the third code number.
10. Press OK . The display shows `Entry successful` , then `Codes` . A few moments after exiting Configuration programming, if the code was entered properly, the display should show `System online` .

    Note: If the code entry is unsuccessful, the display shows `Invalid code` . If this happens, reenter the code or call Northern Telecom Customer Response Center for assistance (1-800-321-2649).

Replacing equipment

Adding or moving Base Stations

There are two reasons to add or move a Base Station.

- to correct deployment problems such as holes in a coverage area or not enough Base Stations to handle traffic in a given cell

- to facilitate system growth which will mean an increase in the coverage area or traffic

Considerations involved include

- making sure that there are no more than four Base Stations per cell
- verifying that there are enough spare TCM units on existing cards; otherwise, new CMRC or CMBC cards must be installed
- if necessary, relocating the system card set to a new shelf to accommodate new cards (see “Relocating the system” on page 157)
- installing or upgrading RPIs if no spare power ports are available on existing RPIs

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost. After a short initialization sequence, the Base Station will be disabled and System Reevaluation will be required to make the Base Station operational and include it into the configuration.

ATTENTION!

Taking a Base Station out of service causes radio coverage to degrade.

The following instructions describe how to add or move a Base Station. The first eight steps apply only to moving a Base Station. If a Base Station is being added, begin with step 9.

1. Disable the associated TCM devices using the Administration Terminal or Companion Manager software (see “TCM Status” on page 134).
2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.

6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.
7. Lift the Base Station away from the bracket. Remove TCM and power wires from the mounting bracket.
8. Remove the mounting base.
9. Mount and connect the Base Station (see “Installing Base Stations” on page 12).
10. Install and connect an additional RPI if required (see “Installing remote power interconnect units” on page 17).
11. Install an additional CMRC or CMBC card if required (see “Installing Meridian Companion cards” on page 58).
12. Make wiring changes as necessary (see “Wiring the Time Compression Multiplexing lines” on page 50). Make sure that any exposed wiring has secondary protectors installed.
13. If a Base Station is being moved, reenable previously disabled TCM devices as discussed in “TCM Status” on page 134.
14. If you have moved a Base Station, perform System Reevaluation. If you have added a Base Station to an existing cell, perform a manual re-evaluation.
15. Note configuration changes in *Meridian Companion Programming and Provisioning Record*.

Replacing a defective Base Station

To replace a Base Station, you do not have to power down the system. When you replace a Base Station, no portable registration information is lost.

A `Re-eval recommended` message will be displayed. Your choices are to perform System Reevaluation, schedule it for off-hours, or `CLEAR` to disregard the message. You need to perform System Reevaluation only if the Base Station location changed in addition to replacing the defective Base Station.

If troubleshooting procedures (see “Troubleshooting a Base Station” on page 177) indicate that one or both Base Station radios are defective, the Base Station must be replaced as follows:

1. Disable the associated TCM devices using the Administration Terminal software (see “TCM Status” on page 134).
2. If the Base Station is powered locally, unplug the power supply from the AC outlet.
3. If an external antenna is installed, unplug its coaxial cable from the Base Station.
4. Remove the Base Station cover.
5. Unplug the TELADAPT cable from the Base Station.
6. Hold the Base Station (to prevent it from falling) while applying upward pressure to it.
7. Lift the Base Station away from the bracket.
8. Mount and connect the replacement Base Station (see “Installing Base Stations” on page 12).
9. Reenable previously disabled TCM devices as discussed in “TCM Status” on page 134.
10. A `Re-Eval recommended` message will be displayed.

Adding expansion cards

Add CMRCs, CMLCs, or CMBCs to the system if existing cards cannot accommodate additional Base Stations or portable telephones. Expansion cards can be added to a live system as long as existing cards and faceplate cables are undisturbed. Alternatively, the entire system can be disabled during installation.

New cards must be added to the right of an existing system. If there is no space for additional cards to the right of the current system, try to move other Meridian 1 cards to create sufficient space (after disabling the cards using the Meridian 1 Administration Terminal). If it is impossible to create enough space by moving cards, relocate the Meridian Companion cards as described in “Relocating the system” on page 157.

Feature MC32 with Package 350 on an Option 11, Release 24 system effectively doubles the WTN or portable capacity of the cards. If you want to add more portable telephones, you can register an additional 16 on the existing CMCC, CMLC and CMRC cards.

If the number of portable telephones will stay the same and the area of coverage will increase, it may be necessary to deregister some portables from a CMLC, reregister them to another expanded card and replace the CMLC with a CMBC.

If you are installing a new CMRC or CMBC, make sure enough power ports are available on existing RPIs to accommodate new Base Stations. If there are an insufficient number, RPIs must be added or upgraded as described in “Installing remote power interconnect units” on page 17.

STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

To install the new cards

1. Ensure the card slots are disabled on the Meridian 1 side. Refer to “Using maintenance commands” on page 125.
2. Insert the card or cards from right to left as described in “Installing Meridian Companion cards” on page 58.

   The LEDs on the cards should come on immediately, flash three times, then remain on.
3. Faceplate cabling should be installed from right to left, with the last cable connecting the new card set to the live system. The SP LED on the CMCC card will begin flashing.

   The card LEDs should go out about 20 seconds apart.
4. If a card LED remains on, refer to the troubleshooting guidelines described in “Troubleshooting a remote power interconnect unit” on page 178.
5. Approximately 30 seconds after the last card LED goes out, the SP LED stops flashing. Use the Administration Terminal to confirm the status as described in “Card Status” on page 130.
6. Enable the new cards from the Meridian 1 system, as described in “Card Status” on page 130.

7. Program the cards as described in “Configuring the Meridian 1 for the Meridian Companion system” on page 103.

Optimizing Card Slot Usage

You can optimize the card configuration by enabling the double density feature (32 WTN) and replacing CMRC or CMLC cards with CMBC cards.

Users registered on the CMRC/CMLC cards being removed must be MANUALLY reregistered onto new WTN positions created on each of the remaining CMCC/CMRC cards. Automatic relocation of registration data is NOT provided. These relocated users must also be moved to the corresponding TN positions on the Meridian 1.

If a CMBC card is to be added to the card configuration, additional radio credits may be required.

Replace CMRCs or CMLCs at the right hand end of the system with CMBC cards to expand a system. Whereas normally this type of card configuration change would cause an exception condition (see “Config failure: Nonrecoverable inconsistency” on page 169), the change can be accomplished using the following procedure.

The following procedure outlines the process for replacing CMRC or CMLC cards with CMBC cards

1. Perform the system upgrade from DRx to DR4, but DO NOT EXECUTE RE-EVAL.
2. Clear all programmed portable data from the CMRC/CMLC cards to be removed.
    a. De-register portables from the WTNs.
    b. Remove any radio loss handling data for these WTNs (see “Programming Call Transfer on Radio Loss” on page 115).
    c. Retain wireless TN datafill until step 8.
3. Disconnect the appropriate faceplate cables and remove the CMRC/CMLC cards to be replaced.
4. After the "Failed" alarms appear for the disconnected cards (i.e. Alarms 51/52 as appropriate), DISABLE then RE-ENABLE each of the

"Failed" cards (see “Card Status” on page 130). Once re-enabled, card status will change to "Removing".

5. Wait 5 minutes until the card(s) disappear from the configuration, then install the new CMBC cards and reconnect the faceplate cables.

6. Connect ALL additional base stations to ports on the CMBC cards, confirm they appear in "Maint" state on the appropriate ports, and then perform Re-Evaluation.

7. Enable the expansion to double user capacity on the existing cards (see “X11 release 24 with package 350, feature MC32” on page 110; see “WTN” on page 83). A warm reset will follow this programming.

8. Once the system has come on-line, perform the corresponding program data relocation on the Meridian 1 and reregister de-registered portables to the 16-31 WTN range on the expanded cards.

Relocating the system

When new cards are added, it may be necessary to relocate the existing system within the same IPE Module (that is, shifting the cards to the left to accommodate new cards) or to another module. The following procedure applies to either case.

STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Note: It is suggested that you perform a System Reevaluation and backup just before relocating the system.

1. If using a new IPE or CE/PE Module, complete installation and preparation of that shelf.

2. Disable the Meridian Companion system.

3. Disable the corresponding IPE card slots from the Meridian 1 side, as described in “Meridian 1 card maintenance” on page 126.

4. If other module cards are involved in the relocation, disable them as described in “Meridian 1 card maintenance” on page 126.
5. Remove faceplate cables from the Meridian Companion cards. Note the sequence of the cards; they must remain in the same order.
6. Remove the cards from the Module.
7. Relocate and reenable other Meridian 1 IPE Module cards, as described in “Meridian 1 card maintenance” on page 126.
8. Relocate TCM connections for the Base Stations, RAD, and Administration Terminal by reconnecting the original cabling to the new card slots or by rewiring the cross connections.
9. Install the Meridian Companion cards in their new slots, keeping the original order.
10. Install faceplate cables from right to left so the last connection is made between the CMCC and the card to its right.

    When the connection to the CMCC occurs, the system LED will resume flashing as the system begins to initialize the expansion cards. The card LED may turn off, then turn on as initialization progresses. When the system LED stops flashing and stays on, the initialization is complete. All card LEDs should also be solid.
11. Reprogram the Meridian 1 system to relocate portable telephone user TNs to their new card and unit (if applicable) positions. Enable the cards from the Meridian 1 side.

ATTENTION!

Maintain the same relative slot positions when reprogramming WTNs. Otherwise, users will not receive their calls.

12. The Administration Terminal will display `System startup` .

    Note: If the Administration Terminal is not functioning, make sure that it is properly connected to the first port on the CMCC card.

Enter a Maintenance programming session, reenable the system, and press [Rls] to exit.

Once the enabling is complete, the Administration Terminal will display one of the following:

— a Config warning message

– System online

— a Config failure message

13. Follow the instructions described in the paragraph that relates to the message displayed.

    a. A configuration warning message is normal, and is accompanied by two options, RESET and RESUME . If M1 programming and rewiring are complete, press RESUME .

    b. System online appears if the M1 reprogramming and rewiring has been into a new IPE Module and the cards are occupying exactly the same slots as in the previous module. No action is required; proceed to step 18.

    c. The configuration failure message indicates that the cards have not been installed correctly (that is, in their original order). Repeat steps 9 through 12.

14. After pressing RESUME , you will see System startup, followed by System online . If the message UTAM test failed is displayed, check that you have moved the wiring over properly. If Base Stations have not been properly reconnected to the new card slot and TCM device positions, a Re-Eval required message displays. Follow these steps:

    a. Clear the alarm message (see “Responding to event and alarm messages” on page 141).

    b. Rewire as necessary.

    c. Restart the system.

    Note: Auto Administration does not report missing Base Stations, only those that have been relocated to a different address. Even

if the `Re-Eval required` message does not display, it is important to proceed with the next two verification steps.

15. Using the instructions described in "Card Status" on page 130, verify that all cards are present and appear in the `Idle` state.
16. Using the instructions described in "TCM Status" on page 134, verify that all Base Stations are located in the appropriate slots and that the Administration Terminal is in the first CMCC port.
17. Set the proper system date and time as described in "Programming the system time and date" on page 87.
18. Verify proper operation by placing a call to at least one portable telephone on each card.

Replacing a defective expansion card

STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

"Troubleshooting cards" on page 173 lists the signs that indicate the need for a card replacement. Card replacement should be performed when the card is idle.

If the defective expansion card is on the far right of the Meridian Companion set of cards, it can simply be removed and replaced with a new card. If the card is in the middle of the card set, replace it by following these steps:

1. Disable the card from the Meridian 1 system and the Meridian Companion system.

2. Open the door of the IPE or CE/PE Module or expansion cabinet.

WARNING!

Each maintenance cable has a left plug and a right plug. Switching the plugs will disable the Meridian Companion system.

3. Attach the left plug of the CMRC, CMLC or CMBC maintenance cable to the interboard faceplate cable harness or bypass faceplate cable harness to the left of the defective card.
4. Attach the right plug of the maintenance cable into the cable harness to the right of the defective card.

   Note: The maintenance cables for CMRC and CMLC/CMBC are wired differently and cannot be interchanged. The CMBC and CMLC use the same maintenance cable

5. Lifting the faceplate connectors, unplug the faceplate cable harness from J1 and J2 of the defective card.
6. Remove the defective card.
7. Replace the defective card with a new card.
8. Attach the faceplate cables to the new card.
9. Remove the maintenance cable as shown in Figure 32: Maintenance cable, on page 163.
10. Reenable the card from the Meridian 1 system and the Meridian Companion system.

Replacing a defective ROM card

If troubleshooting indicates defects, replace the ROM card.

Note: It is suggested that you perform a System Reevaluation and backup prior to replacing the ROM card.

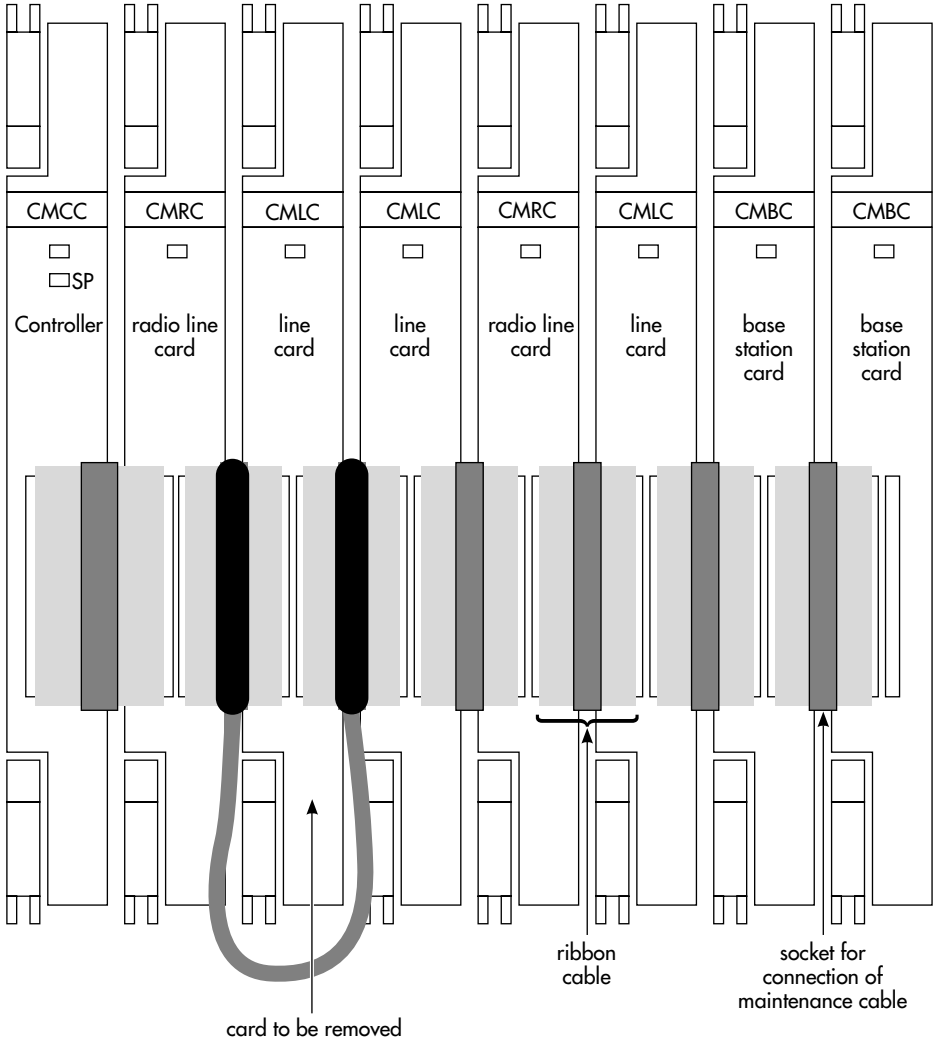
1. Disable all Meridian Companion cards from the Meridian 1 card using the DISC command in LD 32.
2. Ensure proper system grounding by following ESD practices.
3. Disconnect the faceplate cable on the CMCC.

   All LEDs on other Meridian Companion cards turn on.
4. Remove the CMCC. The Meridian 1 system indicates that there is a card polling failure with the XMI001 LoopShelfCard.
5. Unscrew the ROM from the two plastic standoffs.
6. Slide the old ROM card from the right-angled connector mate P2.
7. Slide the new ROM card into the right-angled connector mate P2 on the CMCC.
8. Screw the new ROM card securely to the standoffs.
9. Reinstall the CMCC and reconnect faceplate cables.
10. Verify appropriate LED activity.

    The Meridian 1 system indicates that card polling is reestablished with the XMI002 LoopShelfCard.

    Wait for the system LED on the CMCC to stop flashing.
11. Use the Meridian Companion Administration Terminal to verify that the system is operating properly, that the ROM card software version is correct, and that there are no unexpected alarms or events.
12. Reset the Meridian Companion time and date.
13. Enable the cards from the Meridian 1 side.
14. Verify operation using a portable telephone.

Figure 32 : Maintenance cable



Replacing a defective CMCC

STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Note: Before replacing the CMCC, you must perform a system backup and record the current SSN. Change the new CMCC SSN to the original (Regression code) SSN. Perform restore.

If troubleshooting procedures indicate that the CMCC should be replaced

1. Disable all Meridian Companion cards from the Meridian 1 side.
2. Open the door of the IPE or CE/PE Module or expansion cabinet.
3. Lifting the faceplate connector, unplug the faceplate cable from the CMCC J2 slot.
4. Remove the defective CMCC card.
5. Remove the ROM from the defective CMCC.
6. Install the ROM on the new CMCC.
7. Install the new CMCC into the slot.
8. Reconnect the faceplate connector.
9. Reprogram the system as described in “Programming the Meridian Companion system” on page 73 or, if you have Companion Manager installed, perform a restore operation.
10. Reenable the cards on the Meridian 1 side.

Replacing a defective remote power interconnect unit

If “Troubleshooting a remote power interconnect unit” on page 178 indicates that the RPI is defective, replace it as follows:

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM Status” on page 134.

2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.
4. Disconnect the wires from the RPI.
5. Remove the two bottom screws.
6. Lift up and remove the RPI.
7. Hang the new RPI on the two top screws.
8. Install and fasten the two bottom screws.
9. Reconnect all the wires to the RPI.
10. Close the RPI cover.
11. Plug the RPI power cord into the AC outlet.
12. Reenable the TCM ports associated with the RPI using the instructions in “TCM Status” on page 134.
13. Perform reevaluation if necessary.

Replacing an RPI power unit

If the problem appears to be related to the power supply unit, follow these instructions.

ATTENTION!

Unplugging an RPI renders any attached Base Station out of service.

1. Perform an orderly shutdown of the TCM ports associated with the RPI using the instructions in “TCM Status” on page 134.
2. Unplug the RPI power cord from the AC outlet.
3. Press the release catch with a screwdriver and open the cover.
4. Disconnect the jumper lead, grounding plates, grounding strap, and cable from the connection board.
5. Unscrew the power supply unit and remove it.

6. Place the new power supply unit and fasten its screws.
7. Connect the jumper lead, grounding plates, grounding strap, and cable from the connector board.
8. Close the cover.
9. Plug the RPI power cord into the AC outlet.
10. Reenable the TCM ports associated with the RPI using the instructions in “TCM Status” on page 134.
11. Perform reevaluation if necessary.

Replacing a defective Remote Access Device

Remove it, then replace it with a new unit following instructions in “Installing a Remote Access Device” on page 46.

Replacing a defective Administration Terminal

A system Administration Terminal that cannot access the Meridian Companion system may be defective. To replace the defective terminal, disconnect its telephone cord, then install a new terminal using the instructions in “Installing a Companion Administration Terminal” on page 41.

Portable

To replace a portable

1. Deregister the portable from all systems to which it is registered.

Note: If the portable is deregistered outside the range of a system, it is necessary to perform deregistration of the appropriate ports on the system prior to attempting to register another portable.

2. Register the new portable following the instructions in “Registering portable telephones” on page 121.

Entering codes for system replacement and recovery

A Regression Code restores an original System Security Number (SSN). UTAM Activation Codes and Portable Credit Codes only work with the original SSN. A Regression Code cannot be reused. You may need a Regression Code if one of the following conditions occurs:

- a defective Controller is replaced
- a Controller has lost its SSN due to a power outage for more than 72 hours

If you need a Regression Code

1. Retrieve and record the new System Security Number (SSN) once the system is powered up. (See page 96 for information on retrieving SSN.)
2. Locate the following information in *Meridian Companion Programming and Provisioning Record*:
   — original SSN
   — all previous codes recorded in the "UTAM Activation and Portable Credit Codes" table
3. Call Northern Telecom Customer Response Center (1-800-321-2649) to request a Regression Code.

   You will need to provide them with the original and new SSNs, Companion ID, and site zip code.
4. Note the Regression Code.

   Note: Do not record this code in the Programming Record. A Regression Code cannot be reused.
5. To enter the Regression Code
   a. Press [Feature] , then [*] [*] [0] . The display shows **Password:** . Enter the Installer password.
   b. The display shows **A. Configuration** . If the password is incorrect, the display shows **Password:** . Press [RETRY] , and enter the password again.
   c. Press [↓] . The display shows **1. Telephony Data** .
   d. Press [←] . The display shows **4. Software Codes** .
   e. Press [↓] . The display shows **SSN:nnnnnnnn** .
   f. Press [→] . The display shows **Codes** .
   g. Press [↓] . The display shows **Code 1:** . Enter the first code number of the Regression Code. Use [BKSP] for corrections.

h. Press OK . The display shows Code 2: . Enter the second code number.

i. Press OK . The display shows Code 3: . Enter the third code number.

j. Press OK . This will restore the system to its previous SSN.

6. If you have Companion Manager installed and have previously performed a system backup, perform a restore operation. If not, proceed with the following steps.

7. Repeat steps 5e to 5i for each code recorded in *Meridian Companion Programming and Provisioning Record*.

8. Verify that the correct number of Portable Credits and Radio Credits is available (see "Verifying Portable Credits" on page 122).

9. Reenter all programming data.

10. Reregister all portables.

Handling Meridian Companion exceptions

An exception during system initialization or operation can disable the system, except for the Administration Terminal, dropping all calls. As the system enters a disabled state, the Administration Terminal displays an exception message, preempting any existing alarm message.

The three defined Meridian Companion abnormalities, listed below, relate to configuration inconsistencies and are described in the sections that follow.

- Config warning: Recoverable inconsistency
- Config failure: Nonrecoverable inconsistency
- Config ambiguous

During a Meridian Companion exception, the feature key is disabled, preventing you from entering a feature session. The only available actions are RESET and RESUME , as shown by the softkeys. They are described below.

Config warning: Recoverable inconsistency

A recoverable inconsistency occurs only during system startup after system cards have been relocated (moved as a group without changing relative card

positions; see “Relocating the system” on page 157). It serves to remind the installer that all WTNs must be reprogrammed from the Meridian 1 system and that MDF cabling must be consistent with the new card locations.

The message Config Warning displays after initialization. If the reprogramming and cabling have been performed correctly, you can press RESUME to tell the system to overwrite the old position information and reactivate the system.

Otherwise, you must press RESET . This triggers the installation procedure. A warning message informs you that all data will be erased.

Config failure: Nonrecoverable inconsistency

A nonrecoverable inconsistency can occur during startup or during operation when the system determines that the cards are in a different order from the configuration stored in memory. Card type order has not been preserved, making portable telephone registration data and system configuration data invalid. This can occur if a previously programmed CMCC has been moved to another Meridian 1 system with a different expansion card configuration, or if an installer has replaced an existing CMLC with a CMRC to add Base Station capacity.

The message Config Failure displays. There are two possible actions.

Note: If you press RESUME without correcting the problem that triggered the Config Failure (by returning cards to their old positions), the system will reset itself, once again detect an inconsistency, and display the message again.

1. You can restore the card configuration to its original state, then press RESUME .

2. To keep the new configuration, you must press RESET . This triggers the installation procedure. A warning message informs you that all data will be erased.

Config ambiguous

The Config ambiguous alarm occurs because

- there is one or more empty slots between cards
- a known module has not reported a location
- the system cannot identify a CMBC without at least one powered Base Station connected to it
- the system cannot identify a CMBC to the right of another CMBC that does not have at least one powered Base Station connected to it

Correct the problem and press RESUME.

Troubleshooting

When evaluating malfunctions, it might be useful to refer to “Normal LED behavior upon installation” on page 59.

General troubleshooting procedures

To carry out general troubleshooting procedures, use the following table. These procedures are most effective if you perform them in sequence.

Main task	Steps to follow
1. Diagnose the trouble.	Ask the users for information about • the type of problem they have experienced (placing or receiving calls, dropped calls or noise, or to problems with a feature) • how frequently the problems have occurred • where the problems have occurred • how many portables are affected
2. Check how a feature is being used.	A problem may have been reported because of a misunderstanding about how a feature works. Confirm that the person who reported the problem understands the intended use and operation of all features in question.
3. Check that you can access host switch features from the Meridian Companion system.	To verify if the access lines have been programmed correctly, try the host switch features on two or more portables.
4. Check for programming errors.	Check that the programming recorded in *Meridian Companion Programming and Provisioning Record* is correct for the intended operation of the system. See the specific procedures for troubleshooting problems in this chapter.
5. Check wiring and hardware connections.	Check the wiring and hardware connections. Check for open circuits through the secondary protectors for applications with exposed wiring. See procedures in “Troubleshooting cards” on page 173.

Main task	Steps to follow
6. Check equipment defects.	If hardware is defective, replace it. If the problem requires expert advice, follow your company's procedure for obtaining assistance.
7. Check wireless communication.	Check that you can make and receive calls from various portables. If there is no wireless activity, you may require a UTAM Activation Code, a UTAM Recovery Code, or a Regression Code from Northern Telecom Customer Response Center (1-800-321-2649).
8. Verify connection.	For each cell center in the system, verify that you can establish a connection with all the radios at that cell center. To identify a radio's cell, see "Identifying a radio's cell assignment" on page 102.

Troubleshooting power problems

If the power fails or if the Meridian Companion system is disconnected, all Configuration and Administration data is retained for 72 hours. Check the following if you experience a power failure:

Table 38 : Power troubleshooting

Symptom	Possible problem and solution
Entire system is not working.	Make sure the IPE Module has power.
LEDs on one Base Station are off.	The Base Station or its power source may be defective. See “Troubleshooting a Base Station” on page 177.
LEDs on multiple Base Stations are off.	An RPI may be defective. See “Troubleshooting a remote power interconnect unit” on page 178.

After 72 hours without power, the system may lose its SSN and you will have to obtain a Regression Code to restore wireless communication. See “Entering codes for system replacement and recovery” on page 166.

Troubleshooting cards

Troubleshoot cards using visual inspection and Meridian Companion maintenance.

1. Verify that LEDs are functioning properly as described in “Normal card LED behavior” on page 174.
2. Check the status of the cards as described in “Card Status” on page 130.
3. Disable, then enable any suspicious card using the procedure described in “Card Status” on page 130.
4. Repeat as necessary.

Normal card LED behavior

The following two tables describe incidents affecting LED behavior that occur after the system is operational.

Table 39 : Incidents affecting system LED

Incident	Result
new card is added	LED flashes as a new card is added to the live system; the flashing indicates that the card (and any associated TCM device) is initializing (Flashing lasts approximately 30 seconds per card); following initialization, LED is off
warm reset or power up occurs	normal startup sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; LED goes off and stays off
previous disconnected expansion card is reconnected to a live system	LED flashes to indicate that the cards and any associated TCM devices are initializing; after initialization, LED turns off unless system detects that the cards are not in the same order as previously recorded (a non-recoverable inconsistency), in which case system is disabled and LED changes from flashing to on until exception is cleared
Administration Terminal or Companion Manager user disables system	LED goes on
system is powered up after being moved	normal startup sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; after flashing stops, LED is on solid, indicating system is disabled due to config warning
system is powered up after any CMRC, CMLC, or CMBC have been rearranged	normal start-up sequence followed by flashing that continues until CMCC and all connected expansion cards have completed initialization; after flashing stops, LED is on solid, indicating system disabled due to config failure

After initialization, the card LED status depends on the following:

- whether the expansion card is connected to the CMCC
- whether the card has been enabled from the Meridian 1 system
- whether the card has been enabled by Meridian Companion from either the Administration Terminal or Companion Manager
- whether the Meridian Companion system is operating properly

Table 40 : Card LED behavior

Connected to CMCC?	Meridian 1: enabled/ disabled	Meridian Companion: enabled/disabled	Companion system power status	LED behavior
not connected	N/A	N/A	powering up	remain on after flashing three times
being connected	enabled	N/A	normal	go off quickly
already connected	enabled	N/A	powering up	flash three times, go on, then go off quickly
being connected	disabled	card and system enabled	normal	go off slowly
being connected	disabled	system disabled	normal	remain on
being connected	disabled	system enabled; individual cards disabled	normal	LEDs of disabled cards on; others go off slowly
already connected	disabled	card and system enabled	powering up	flash three times, go on, then go off slowly (one at a time, 20 seconds apart)
already connected	disabled	system disabled	normal	remain on

Table 40 : Card LED behavior (continued)

Connected to CMCC?	Meridian 1: enabled/ disabled	Meridian Companion: enabled/disabled	Companion system power status	LED behavior
already connected	disabled	system enabled; individual cards disabled	powering up	flash three times, go on, then LEDs of disabled cards stay on; others go off slowly
already connected	disabled	disabled	normal	LED goes on
already connected	reenabled from either side after being disabled from both sides		normal	LED goes off

Troubleshooting the Administration Terminal

Note: If the CMCC system LED has stopped flashing and the Administration Terminal has no display, it is not properly connected to the CMCC. If the CMCC system LED stops flashing but the Administration Terminal button LCDs continue to flash, the Administration terminal is not connected to one of the first five TCM ports on the CMCC. In either case, check the main distribution frame wiring and correct any problem.

1. Check that the time and date appear on the display.
2. Check the display. If the display is unreadable, ensure that the display contrast adjustment (Feature * 7) is adequate.
3. Check that power is on in the system.
4. Check that the Administration Terminal is connected to the correct port.
5. Check the 50-pin connectors at the system and make sure they are plugged in properly.
6. Check the 25-pair TCM cables at the distribution frame to make sure they are connected to the right ports.
7. Check the telephone wiring connections at the distribution frame to make sure the connections have been made on the appropriate connectors (see “Installing the hardware” chapter).

8. Replace the Administration Terminal with a working Administration Terminal. If the problem persists (see “Troubleshooting” on page 171).

Note: You should find between 18 and 21 V DC across the telephone wires when the Administration Terminal is disconnected.

Troubleshooting a Base Station

1. Verify that the green LED (the power indicator) is on.
2. Verify that the red light is not solid.

   A solid red light indicates that both radios on the Base Station are busy with calls, the system is in a Maintenance state, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.
3. Verify that the red light is not flashing.

   The red LED flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red LED continues to flash, then one of the following problems may exist:

- The Base Station is not connected to the Controller or line card.
- The wiring to the Base Station is not correct. Check for open circuits through the secondary protectors for applications with exposed wiring.
- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100 Ω. Measure the loop resistance with an ohmmeter. If the resistance exceeds 100 Ω, install a second power pair.
- The Base Station or RPI is faulty.

If the red LED is flashing on multiple Base Stations, one of the following problems may exist:

- The CMCC, CMRC, or CMBC card associated with the Base Stations may not be in place.
- The MDF cable may have been removed.

4. Verify that the power cord of the RPI is properly connected to a working AC outlet. If the Base Station is powered locally, verify that the power

supply is properly connected to a working AC outlet and that the power supply cable is properly connected to the Base Station power connector.

5. If an external antenna is installed, verify that the external antenna's coaxial cable is properly connected to the BNC connector of the Base Station, and that the corresponding radio is programmed to have an external antenna. See "Setting the antenna type for a radio" on page 84.

6. Verify that the system has enough Radio Credits to support all the installed Base Stations. If it does not, call Northern Telecom Customer Response Center at 1-800-321-2649 for a UTAM Activation Code for the number of Radio Credits you are missing.

Troubleshooting a remote power interconnect unit

Multiple Base Station malfunctions usually indicate an RPI problem.

1. Verify that the card associated with the RPI is properly engaged in its slot.

2. Verify the Base Stations.

   a. Check to see that the green light is on.

   b. Check to see that the red light is not solid.

      A solid red light indicates that both radios on the Base Station are busy, the system is in a Maintenance state, that the system is downloading data to the Base Stations, or that the radios have not been assigned to a cell.

   c. Check to see that the red light is not flashing.

      The red light flashes for about 15 seconds when a Base Station is powered up. This is normal. If the red light continues to flash, then one of the following problems may exist:

      – The system is not on.

      – The Base Station is not connected to the system.

      – The Base Station radios have not been assigned to a cell.

      – The wiring to the Base Station is not correct.

- The two-way DC loop resistance of the power pair(s) between the RPI and the Base Station exceeds 100 Ω. Measure the loop resistance with an ohmmeter. If the resistance exceeds 100 Ω, install a second power pair.
- The distance between the RPI and the Base Station is in accordance with the values in Table 4 in the chapter "Installing the hardware." If not, power the Base Station with a plug-top power supply, move the RPI closer to the Base Station, or use two RPI power pairs if you were using only one.
- There is a faulty Base Station or RPI.

3. Verify that the RPI is connected to a working power source and that all connections to the RPI (power cord, jumper lead, input and output, etc.) are correct and secured.
4. Check that the UPS fuse is live.
   a. Remove the RPI cover.
   b. Unplug the RPI from the AC outlet.
   c. Remove the fuse cover.
   d. Visually inspect the fuse to see if it needs replacement.
   e. Replace the fuse if necessary.
5. Make sure the TCM device wiring has been correctly installed.
6. If none of the Base Stations connected to the RPI (or to one of its power supply units) are functioning correctly, replace the RPI (or power supply unit).

   Note: The left power supply unit provides power through output connectors OBIX1 to OBIX8, and the right power supply unit provides power through OBIX9 to OBIX16.

7. If only one or a few of the Base Stations seem faulty, try putting the Base Station on another RPI power pair connector. If you continue to have difficulty, see "Troubleshooting a Base Station" on page 177.

Troubleshooting portable telephone problems

When there is a problem with a portable telephone

1. Make sure the portable telephone is designed to be compatible with Meridian Companion.
2. Verify that the portable telephone is on and that the battery is not low.
3. Establish a radio connection to get dial tone. (Ensure that the portable telephone's twinned desk telephone, if any, is idle.)

   If no dial tone is present, the portable might not be registered. Verify that the system has available Portable Credits and try to register the portable again.

   If the number of available Portable Credits is 0, then you will need to obtain additional credits before you can register the portable (see "Adding Portable Credits" on page 148).
4. On a portable, press Feature . The display shows FEATURE LIST .
5. Press ▽ or △ until the display shows Feature request .
6. Press SELCT . The display shows A- .
7. Press * 0 . The display shows the number to which the portable telephone is registered.
8. See Table 41 for a summary of troubleshooting techniques.

Table 41 : Troubleshooting portable telephones

Problem	Cause	Solution
• no link, phone icon does not go off hook • “connection failed” message displays	• batteries are defective, not charged, or not installed • portable is out of range of all working Base Stations • portable telephone is not registered • all Base Stations are busy • wrong system is selected	• replace, charge, or install batteries • ask technical support for assistance • repeat registration process for the portable telephone • retry call or move to another cell
• link is established, but there is no dial tone	• telephones are MADN, and the other telephone is off-hook • Meridian 1 programming problem: WTN is enabled but not configured	• make sure other telephone is not off-hook • ask technical support to check that the Meridian 1 system is correctly programmed
• link is established, but there is an overflow tone	• WTN module from the Companion side is disabled or defective or failed • Meridian 1 TN or card is disabled, defective, or has failed	• ask technical support for assistance in correcting the Companion or Meridian 1 problem
• voice quality is poor • calls are frequently dropped	• there is a portable telephone or system problem	• try another portable telephone; if the problem still exists, it is related to the system (poor coverage) and should be reported to technical support; otherwise, the portable telephone is defective and should be replaced

Verifying Radio Credits

1. Press Feature * * 0 and enter the Installer password. The display shows A. Configuration.
2. Press ↓ . The display shows 1. Telephony Data .
3. Press → . The display shows 2. Mobility Data .
4. Press ↓ . The display shows Re-Evaluation .
5. Press → . The display shows Radios .
6. Press ↓ . The display shows Radio credits .
7. Press ↓ . The display shows nnn Available and nnn Total . Verify that the total number of Radio Credits was enough to support the system you have just installed. If you received a UTAM message 0 Available , verify that the total displayed equals what you thought you should have. If you received the UTAM test failed message, verify the number of Base Stations.

Note 1: The number of Radio Credits must be double the number of Base Stations you have installed. Refer to *Meridian Companion Programming and Provisioning Record* to determine the number of Base Stations. Each Base Station has two radios, so each Base Station requires two credits.

Note 2: As each Base Station is initialized, the number of available Radio Credits will decrease accordingly.

Troubleshooting a RAD

There are two ways to tell if the RAD is not functioning properly.

- If the Administration Terminal can communicate with the Meridian Companion system but the remote PC cannot, the problem may be due to a malfunctioning RAD.
- The techniques described in “TCM Status” on page 134 indicate that the RAD has failed or that the port is not equipped.

Troubleshooting an alarm

Table 42 : Alarm troubleshooting

Alarm	Meaning	Possible causes and actions
Alarm:10	All TCM devices, including the Administration Terminal, have been disconnected from the CMCC.	This alarm is usually discovered after the problem has been corrected (because the Administration Terminal is nonfunctional while the alarm is active). If it occurs unexpectedly 1. Verify that the 25-pair cable connector is inserted properly. 2. If there are TCM devices connected to the system, check all the wiring associated with these TCM devices.
Alarm:11	The internal circuitry has failed.	The CMCC is defective Replace the CMCC (follow the instructions on page 164).
Alarm:23-xx	Cell xx is out of service because there are no operational radios in that cell.	This alarm occurs only at the end of System Reevaluation. During the last step of reevaluation, or after a system restart, as the system was activating cell xx for use, it could not find a radio to serve as a CSC. Check for the presence of the Base Station in cell xx. If the Base Station is present and in maintenance state, execute System Reevaluation. If the Base Stations do not appear, check the wiring and power. Replace the Base Station if it is defective. After replacement, reexecute System Reevaluation.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
`Alarm:24`	Wireless communication may be disabled the next time the system is powered up.	This message occurs only at the end of System Reevaluation. It could be due to one of the following: • The system has fewer than four cells. • The system is brought online before all Base Stations are properly connected. • There is a break in the power or TCM connections to some Base Stations. ***Note:*** Do not attempt to solve the problem by repowering. 1. Check that the correct number of Base Stations have been connected and that the system recognizes the Base Stations (see page 151). If all the Base Stations you expected to see are not showing or they are in a failed state, check • that the TCM wiring of Base Stations is correct • that there is power to the Base Stations and RPIs or plug-top power supplies • that the location and number of Base Stations are correct • that any Base Station Modules are properly connected to the expansion ports 2. Once you have corrected the problem run a System Reevaluation (see “System Reevaluation” on page 142). If you continue to experience `Alarm:24` after running System Reevaluation, you have either insufficient Base Stations or an insufficient deployment. ***Note:*** If on the next power interruption you have a disabled system, the display will show `UTAM test failed`. Refer to “UTAM code req’d” on page 187.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
Alarm:50-cc	All Base Stations on card cc have become disconnected from the system for at least 1 minute. or Card cc , which was restarted more than 3 minutes ago, has no operating Base Stations.	The MDF cable from the IPE slot containing CMRC has been disconnected. Reconnect the cable. Power to all Base Stations connected to the CMRC card has been lost (RPI is defective or disconnected). Check that the RPI is connected or replace defective RPI. A faceplate cable in the chain between the CMCC and this CMRC or CMBC has been disconnected or loosened from its connector. Remove and replace the cable. The CMRC or CMBC is defective. Replace the CMRC or CMBC.
Alarm:51-cc	All 16 WTNs (or 32 WTNs for MC32 feature with package 350) on CMRC or CMLC have been disconnected from the system for at least 1 minute. or CMRC, CMLC, or CMBC cc, which was restarted more than 3 minutes ago, is still not operational	The CMRC has been disconnected from the IPE Module slot. Reconnect the CMRC. A faceplate cable in the chain between the CMCC and this CMRC or CMLC has been disconnected or loosened from its connector. Reconnect the cable. CMRC, CMLC, or CMBC has an internal defect. Replace it.
Alarm:53-ccuun	An internal Base Station error has occurred.	Actions/causes depends on failure indicated in the event code. See associated 30X event code in Table 43.
Alarm:56-ccuu	A TCM device ccuu failure has occurred.	There is a problem with the wiring to the device. Reconnect the CMRC. The power to the TCM device has been interrupted. Reconnect the power. The device has an internal defect. Replace it.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
Config warning	Cards have been relocated and the system is disabled.	See “Handling Meridian Companion exceptions” on page 168.
Config failure	Cards have not been reinstalled correctly in their original order and the system is disabled.	See “Handling Meridian Companion exceptions” on page 168.
Config ambiguous	The system cannot recognize a card.	Avoid empty slots between Meridian Companion cards. Make sure that every CMBC card has at least one Base Station connected and powered on. Correct the problem and press RESUME.
System coldstart	A nonrecoverable NVRAM corruption was detected during restart. A cold start occurs automatically. This message appears only at power up.	This is normal for a new installation. If this occurs on repowering an existing system, it means that the system has lost its memory. Reprogram the system using the programming record. Reregister all portable telephones.
Re-Eval required	The Meridian Companion system has detected a need for System Reevaluation.	This message displays for three reasons. • a new Base Station was added to the system • a Base Station was moved to a different port • a Base Station lost power and the TCM port location changed Run System Reevaluation immediately or schedule a System Reevaluation.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
Re-Eval recommended	The Meridian Companion system has detected a possible need for System Re-evaluation.	This message displays when • a Base Station is replaced with a new Base Station • a Base Station loses power but the TCM port did not change Action is left to installer's discretion. • continue with System Reevaluation • schedule a reevaluation • CLEAR the message and continue without running System Reevaluation
UTAM code req'd	The wireless system is disabled.	This is normal for a new installation. Follow the procedures described in "Activating wireless communications" on page 93. The only other time this alarm should appear is if you are rebuilding a system: 1. Enter a UTAM Activation Code. See "Activating a new system" on page 96. 2. Obtain a Regression Code. See "Entering codes for system replacement and recovery" on page 166.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
UTAM test failed	The wireless system is disabled. This alarm will appear only after a restart.	The system detected an incorrect configuration, possibly due to malfunctioning equipment. 1. Use the Administration Terminal or Companion Manager to verify that radios have initialized and are not defective (C. Maintenance). 2. Check • that there is power to the Base Stations and RPI or plug-top power supply • that the location and number of Base Stations are correct • that there are at least four cells in the system configuration • all connections to the CCMC • that there are sufficient Radio Credits to support the number of Base Stations you have connected 3. Restart the system with the correct system configuration. 4. The system may require a UTAM Recovery Code. See “Activating a disabled system” on page 150.

Table 42 : Alarm troubleshooting (continued)

Alarm	Meaning	Possible causes and actions
Radio cred req'd	Too many Base Stations have been connected to the system. This message will appear only after a restart.	Excessive Base Stations have been connected and the total number of available Radio Credits is insufficient to accommodate all the radios. Wireless communication remains disabled. System Reevaluation may be disabled. 1. Verify the total and available number of radio credits using the Administration Terminal. 2. Remove the excess Base Stations and restart the system. To determine the number of connected Base Stations to remove, subtract the total number of radio credits from the total number of connected Base Stations. Remember that each Base Station has two radios. See “Verifying Radio Credits” on page 182. If you have increased the number of Base Stations, you may need a new UTAM Activation Code to cover the increase in radios. ***Note:*** If Radio Credits are required, then reevaluation is disabled.

Understanding event messages

Event messages appear as items in the Administration log or the Event/Alarm log. Most of these event messages appear during normal maintenance. An installer may view the event messages to diagnose a problem in the system.

Each event is assigned a severity number. An S preceding this number (for example, S4), may appear in the event message. S1 has the lowest priority. If the log is full, new event messages with a higher severity number replace existing event messages of a lower severity. For this reason, check event messages at regular intervals and deal with all messages.

Table 43 : Event messages in the Event/Alarm log

Event code	Meaning
EVT221	The Event/Alarm log has been cleared.
EVT222	The debugging facility has been accessed.
EVT299	The system has been restarted after a power outage.
EVT301-ccuux	Radio ccuux cannot successfully receive the data image during download. Both radios belonging to the Base Station will be disabled. This may occur if the flash EEPROM is faulty. The Base Station should be replaced.
EVT302-ccuux	Radio ccuux cannot be written to during data transfer. Both radios belonging to the Base Station will be disabled. The Base Station's flash EEPROM is faulty. The Base Station should be replaced.
EVT303-ccuux	Radio ccuux cannot be synchronized with the other radios in the system. Both radios belonging to the Base Station will be disabled. The Base Station hardware is faulty. The Base Station should be replaced. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur
EVT304-ccuux	Radio ccuux cannot be synchronized with other radios because of system overload.

Table 43 : Event messages in the Event/Alarm log (continued)

Event code	Meaning
EVT305-ccuu2	A B2 channel radio (radio 2 in this case) cannot be synchronized because the B1 radio was disabled in maintenance. Both radios belonging to the Base Station (on port ccuu) will be disabled. The B1 radio must be operational to synchronize both radios of the Base Station with other radios in the system. Two events are raised: one for the B1 channel radio and another for the B2 channel radio. A corresponding alarm code 53 will occur.
EVT306-ccuu1	A radio (radio 1 in this case) cannot be synchronized because there are no B2 channel radios. Both radios belonging to the Base Station (ccuu) will be disabled. Two events are raised: one for the B1 channel radio (as in this case) and another for the B2 channel radio. A corresponding alarm code 53 will occur.
EVT307-ccuux00	A recoverable radio fault has occurred. The radio will be reset. If a link is active when this error occurs, the link is dropped. Radio CCUUX is returned to service.
EVT307-ccuux01	An unrecoverable radio fault has occurred. Radio CCUUX will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.
EVT307-ccuux02	The built-in self-test on the Base Station has failed. Radio CCUUX will be disabled and taken out of service. If a link is active when this error occurs, the link is dropped. A corresponding alarm code 53 will occur.
EVT308-ccuux	The Base Station is connected to a system that supports a radio protocol that Meridian Companion does not understand.
EVT680	Wireless communication has been disabled. This event will always precede a UTAM code req'd or UTAM test failed alarm in the Event/Alarm log.
EVT681	A UTAM Activation Code or a Recovery Code was successfully entered.
EVT682 and EVT683	These are informational event codes for use by Northern Telecom.
EVT684	Reevaluation has been disabled due to an insufficient number of Radio Credits. This event is usually associated with a Radio cred req'd alarm.

Table 43 : Event messages in the Event/Alarm log (continued)

Event code	Meaning
EVT685	A scheduled reevaluation was canceled by the system. This is caused by the time and date having been advanced passed the scheduled time and date.
EVT848	This is a link hand-off error. A small number of these each day is a normal occurrence.
EVT849	Synchronization error.
EVT850	Synchronization error.
EVT851	This is a Base Station software diagnostic message.
EVT882	A reevaluation has been initiated. It precedes the Re-eval in prog alarm in the Event/Alarm log.
EVT887-01091	The reevaluation radio configuration software has encountered a problematic Base Station (on port 01091 in this case).

Table 44 : Event messages in the Administration log

Event code	Meaning
EVT220	The Administration log has been cleared.
EVT400	The system has been manually restarted.
EVT412	The Installer password has been changed. The parameter contains the extension number that changed the password.
EVT413	The Administration password has been changed. The parameter contains the extension number that changed the password.
EVT414	Someone tried to enter the system with an invalid Installer password.
EVT415	Someone tried to enter the system with an invalid Administration password.
EVT416	Someone has initiated a Configuration programming session.
EVT417	Someone has initiated an Administration programming session.
EVT419	The system time has been changed by a user.

Table 44 : Event messages in the Administration log

Event code	Meaning
EVT434	The Registration password has been changed.
EVT440	An invalid software code has been entered.
EVT450	Someone has initiated a Companion Manager session.

You should rarely see event messages other than those described in Table 43 and Table 43. Other messages occur when the Meridian Companion system has followed its normal recovery from an unusual combination of system events. If the same event number keeps appearing and is not described in Table 32 or Table 43, report it to your installer or distributor.

Appendix A: Programming overview

Table 37: Programming overview

A. Configuration	B. Administration	C. Maintenance
1. Telephony Data Dial delay B03 Gain Values Side tone CMCC slot 32 WTN	1. Registration Mstr Reg Enbl WTN Reg Status Show WTN: Reg Locked:	1. System Status
2. Mobility Data Re-Evaluation Re-Eval status Re-Eval schedule	2. User Options Radio loss hdlng Change Default Dflt: Change WTN:	2. Card Status Show card:
Radios Radio credits Show Radio: Cell Assignment Antenna Type	3. Time and Date Time Date	3. WTN Status Show WTN:

Table 37: Programming overview (continued)

A. Configuration	B. Administration	C. Maintenance
Cells Show Cell: xxx Cxxx: Radios	4. Passwords Admin. password Reg. password	4. TCM Status Show TCM:
System LID		5. Evnt/Alrm Log
3. Admin. set data Installer pswd		6. Admin Log
4. Software codes SSN: Codes		

Appendix B: Regulatory information

Federal Communications Commission (FCC)

The FCC has designated UTAM Inc. to manage the installation and relocation of Unlicensed Personal Communication Services (UPCS). This includes Meridian Companion Base Stations and C3050 portables.

Activation

Wireless communications on a Meridian Companion system cannot be activated until installation at the system's authorized location is verified and approved by UTAM Inc. The system is equipped with an automatic mechanism for disabling wireless operation in the event the system is moved outside the area where its operation has been approved by UTAM Inc. This mechanism complies with FCC requirements.

Registration

Each Meridian Companion PCI system is registered with the FCC based upon compliance with Part 68 of its rules. Connection of the system to the customer analog lines is made through a standard network interface jack, which you can order from your telephone company.

Safety

The Meridian Companion system conforms to the requirements of North American Regulatory Standards as specified in Underwriter's Laboratory UL-1459 Edition 2.

WARNING!

Do not connect the Administration Terminal or Base Stations directly to a CO line interface.

Doing so may result in equipment damage.

CAUTION!

The Meridian Companion Administration Terminal and Base Stations must not be used as off premises equipment.

Installers should check the lightning surge arrestors at the cable entry point to the building with special attention to the grounding. Any problems should be reported to your telephone company in writing.

Because Administration Terminals and Base Stations are not lightning protected, do not install them outside the building.

SHOCK!

To avoid electrical shock hazard to personnel or equipment damage, observe the following precautions when installing telephone equipment:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch telephone wires that are not insulated or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying the telephone lines.

SHOCK!

Install an AC lightning surge arrestor in the AC outlet that connects to the equipment.

Electrical surges, typically lightning transients, are very destructive to terminal equipment connected to AC power sources.

Equipment attachment limitations

The Federal Communications Commission (FCC) label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The FCC does not guarantee that the equipment will operate to the user's satisfaction. Before installing this equipment, you should have permission to connect to the facilities of the local telecommunications company. You must use an acceptable method of connection to install the equipment.

Compliance with the preceding conditions might not prevent degradation of service in some situations. Repairs to certified equipment should be made by

an authorized U.S. maintenance facility designated by the distributor. Any repairs or alterations made by anyone else to this equipment or any equipment malfunctions can give the telecommunications company cause to request disconnection of the equipment.

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

SHOCK!

Users should not attempt to make electrical ground connections themselves.

Users should contact the appropriate electronic inspection authority or electrician, as appropriate.

This equipment cannot be used on public coin phone service provided by the telephone company.

Telecom compliance

The Meridian Companion PCI system meets FCC Part 68 requirements for loop start Central Office interface.

Telephone company notification

You do not need to contact your telephone company before connecting a Meridian Companion PCI system to the telephone network. The telephone company, however, might ask you to provide the following information:

- telephone number or numbers to which the system will be connected
- FCC Registration Number (on the FCC label)
- Ringer Equivalence Number (on the FCC label)
- type of jack (RJ21X)

- Facility Interface Code (02LS2)
- Service Order Code (9.0F)

Rights of the telephone company

If a Meridian Companion PCI system is determined to be causing harm to the telephone network, the telephone company can discontinue your service temporarily. If possible, the company will notify you in advance, but if advance notice is impractical, you will be notified as soon as possible. You will be given the opportunity to correct the situation, and you will be informed of your right to file a complaint with the FCC.

Your telephone company might make changes in its facilities, equipment, operations, or procedures that could affect the correct functioning of your system. If the company does, you will be notified in advance, to give you an opportunity to maintain uninterrupted telephone service.

In the event of an equipment malfunction, all repairs will be performed by Northern Telecom Ltd. or one of its authorized dealers.

Radio Frequency Interference

The Meridian Companion PCI system complies with the FCC Part 15-Subpart D Regulation. Operation is subjected to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that might cause undesired operation.
3. This device cannot be activated until installation at its authorized location is verified by UTAM Inc.

Ringer Equivalence Number

The Ringer Equivalence Number (REN) is used to determine the quantity of devices that may be connected to the telephone line. The REN assigned to each terminal device denotes the percentage of the total load to be connected to a telephone line used by the device to prevent overloading. The REN is increased each time a terminal device is connected to the telephone line. In most areas, the sum of the RENs should not exceed 5. The REN of the system is 1.5 B.

Repair facility

Contact	Northern Telecom Nashville Repair and Distribution Center 640 Massman Drive Nashville, TN 37210

Note for hearing aid users

Use of the portable telephone may produce an audible tone within a hearing aid. A headset recommended for use with hearing aids can prevent the occurrence of the audible tone. Contact your distributor to order a headset.

List of terms

Administration log The Administration log is a list of significant user initiated events, for example, Configuration sessions (during which a change was made), invalid password attempts, and password changes. This log holds a maximum of 10 events, and should be checked and cleared periodically.

Administration programming Administration programming includes setting registration permission, user options, time and date, and passwords.

Administration Terminal A Northern Telecom M7310 wired terminal used to perform Administration and Configuration programming, perform maintenance activities, and display alarm messages. The Administration Terminal does not support voice telephony when connected to a Meridian Companion system.

alarm code A number that appears on the Administration Terminal display informing you of the type of fault the Controller has detected in the system.

antenna Each Base Station has its own built-in antenna. External antennae can be used indoors or outdoors to extend radio coverage to hard-to-reach places such as tunnels or stairwells.

Base Station A Base Station is the communication link between the portables and the Meridian Companion system. Each Base Station contains two radios and can handle two portable telephone calls simultaneously. A Base Station is indirectly connected to a CMCC, CMRC, or CMBC.

Calling Party Name Display (CPND) Available on wireless telephones beginning with X11 release 20B. CPND enables portable telephones with displays to show the names of callers.

CDS See Companion Diagnostic Software.

cell The area covered by one or more radios in close proximity. One or more cells make up the coverage area. Cell sizes vary with layout and building architecture.

cell boundary value The minimum acceptable signal strength value (from a particular Base Station) specified for radio coverage. During site planning, this value is used to locate the outer edge of the coverage area for each cell (see Receive Signal Strength Indicator reading).

cell center The location of the radios or the external antennae serving a cell. This is the point of reference for determining the cell boundary.

CMBC Companion Meridian Base Station Card. Supports 16 Base Stations. It can be installed in the IPE Module, CE/PE Module or option 11 expansion cabinet.

CMCC Companion Meridian Controller Card. Supports the Administration Terminal or a RAD connected to a PC running Companion Manager, 15 Base Stations, and 16 portable telephones. With Feature MC32, CMCC supports the Administration Terminal or a RAD connected to a PC running Companion Manager, 15 Base Stations, and 32 portable telephones. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

CMLC Companion Meridian Line Card. Supports 16 portable telephones. With Feature MC32 enabled, CMLC supports 32 portable telephones. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

CMRC Companion Meridian Radio Line Card. Supports 16 portable telephones and 16 Base Stations. With Feature MC32 enabled, CMRC supports 32 portable telephones and 16 Base Stations. It can be installed in the IPE Module, CE/PE Module, or Option 11 expansion cabinet.

Common Signaling Channel (CSC) radio At each cell center, one radio (the CSC radio) is dedicated to locate and track portable movements. The other radios of that cell center (traffic radios) are used to establish voice connections with the portables.

Characteristics of CSC radios include the following:

- You cannot measure the RSSI of a CSC radio.

- When the voice traffic in a given cell is high, the CSC radio may be used as a traffic radio.
- The CSC radios are allocated randomly at startup.
- If a CSC radio is disconnected, the system chooses another radio at that cell center to be the CSC radio.

Companion Diagnostic Software (CDS) Provides access to real-time and historical radio performance on the Meridian Companion system. CDS runs on a PC (located either on-site or in a remote location), and connects to the Meridian Companion system through a RAD.

Companion Manager Administers one or more Meridian Companion systems. It can be used in addition to or instead of the Administration Terminal. Companion Manager runs on a PC (located either on-site or in a remote location) and connects to each system through a Remote Access Device [RAD]).

Companion Meridian Base Station Card See CMBC.

Companion Meridian Controller Card See CMCC.

Companion Meridian Line Card See CMLC.

Companion Meridian Radio Line Card See CMRC.

coverage area The area in which a portable user should be able to make and receive calls. It can include both indoor and outdoor areas, stairwells, elevators, etc. Base Stations are installed in strategic locations throughout the customer's premises creating a network of overlapping radio cells. Collectively, these radio cells are referred to as the radio coverage area.

CPND See Calling Party Name Display.

CSC radio See Common Signaling Channel radio.

default The settings for all parameters when the system is first installed. Defaults are automatically assigned at system startup. Settings are changed from their default values during programming.

deregistration Disabling a portable telephone from working on a wireless system.

Directory Number A number that can be assigned to a single telephone or to multiple telephones, for example, a portable telephone and a wireline. See TN.

DN See Directory Number.

event message Event messages are stored in the Event/Alarm log and displayed on the Administration Terminal during a Maintenance session. They record a variety of events and activities in the Meridian Companion system.

Event/Alarm log The Event/Alarm log is a list of system generated events and alarm codes. The Event/Alarm log holds a maximum of 50 events and should be checked and cleared regularly.

expansion cabinet A cabinet, required for Option 11 systems, that can accommodate Meridian Companion cards.

exposed wiring Telecommunications circuit wiring outside a building structure. Such wiring requires use of primary and secondary protectors.

external antenna A passive radio frequency receiver connected to a Base Station radio. An external antenna can be used instead of the internal Base Station antenna to extend radio coverage to hard-to-reach places or locations where Base Stations cannot be installed.

FCC Federal Communications Commission.

hand-off An active radio link to a portable is transferred from one Base Station to another in the Meridian Companion system (that is, when the user moves from one cell to another). Hand-off occurs when the Controller detects that the strength and quality of the radio signal have gone below a predefined threshold and there is a better radio connection available.

Installer password A one- to six-digit password that is used to prevent unauthorized access to programming, Maintenance, Memory Reset and System Startup. The Installer password can be changed in Configuration programming.

IPE Intelligent peripheral equipment. Meridian Companion cards are installed on the IPE shelf in Meridian 1 Option 21 through Option 81 systems.

ISM Incremental software management. Permits precise definition of user capacity and coverage.

LID See System LID.

M7310 terminal See Administration Terminal.

Main Distribution Frame Frame-mounted BIX modules that cross-connect Meridian 1 terminations. All Meridian Companion wiring connects to the Meridian 1 system through a Main Distribution Frame.

Maintenance Maintenance functions provide system backup and restore functions as well as diagnostic features for the system, cards, and devices.

maintenance cables Two cables, one for the CMLC and one for the CMRC, that allow a defective card to be removed without affecting operation of other cards.

MCRA See Multiple Call Arrangement Allowed.

MCRD See Multiple Call Arrangement Denied.

MDF See Main Distribution Frame.

Message Waiting Indicator A visual or audible telephone set indicator that alerts the user to the fact that a message is waiting.

Multiple Appearance Directory Number (MADN) A host switch feature that allows the assignment of the same host switch telephone number to any number of lines that are wired to the host switch.

Multiple Call Arrangement Allowed Prevents access to a conversation on a portable telephone from the corresponding wireline set. The portable telephone user can originate and receive calls when a set sharing the same DN is on a call.

Multiple Call Arrangement Denied Allows access to a conversation on a portable from the corresponding wireline set. The wireline user can listen in on the portable telephone user's calls.

MWI See Message Waiting Indicator.

password A specific sequence of digits entered from the Administration Terminal dialpad or through Companion Manager to gain access to Meridian

Companion operation and programming.

PC Personal computer.

PCI A protocol used in the United States that is compliant with FCC guidelines for the 1.92 GHZ band.

Portable Credit Code These credits predefine the maximum number of portables that can be registered to the system. Systems can register only as many portables as there are available Portable Credits.To register additional portables, you must obtain Portable Credit Codes for the number of additional portables you need.You can obtain additional codes whenever you need to expand the number of portables, up to a maximum of

- 480 portables for an Option 21–81, Release 24 system with package 350
- 320 portables for an Option 11, Release 24 system with package 350
- 240 portables for an Option 21 through Option 81 system
- 160 portables for an Option 11 system

portables The Companion portable is a battery-powered, pocket-size portable telephone. Meridian Companion can support up to 480 portable telephones depending on card configuration.

Primary protector A voltage surge protector connected between each line conductor and ground located where telecommunications conductors enter a building structure.

Programming The setting of various characteristics of the system. This includes system-wide settings and radio cell assignments.

Programming Record An on-site planning and reference document. All Configuration and Administration settings should be recorded in *Meridian Companion Programming and Provisioning Record.*

Protocol Converter Unit (PCU) Circuitry used on the CMCC and CMRC to provide signaling information.

RAD See Remote Access Device.

Radio Credits The Meridian Companion system software recognizes Base Stations as Radio credits. Each Base Station consists of two radios. The number of Radio Credits licensed to be supported by the system is embedded

in the UTAM Activation Code.

radio link A radio channel between the Base Station and the portable.

Receive Signal Strength Indicator (RSSI) reading The Meridian Companion system portables can display the current signal strength of the portable to the Base Station link. RSSI measurements are displayed as negative values; the smaller the negative value, the stronger the signal strength.

Recovery Code Activates wireless communication on a disabled system.

registration Meridian Companion enables portable telephone registration. Each portable telephone in the system must be registered to a Wireless Terminal Number (WTN).

Registration password Prevents unauthorized users from registering portables on the Meridian Companion system.

Regression Code Required in cases of system recovery. The application of this code, which cannot be reused, restores the previous system security number so that previously applied UTAM Activation Codes and Portable Credit Codes can be reentered to restore full system operation.

Remote Access Device (RAD) Allows a PC running Companion Manager or Companion Diagnostic Software to access the Meridian Companion system. Access may be established by connecting the RAD on the customer site using a local connection, or at a remote location using standard modem equipment.

Remote power interconnect (RPI) An interface providing remote power for the Base Stations. Each RPI can power up to 8 or 16 Base Stations.

RPI See remote power interconnect.

RSSI Receive Signal Strength Indicator.

Secondary protector A series-connected overcurrent protector, with optional voltage surge protection, located between a primary protector and the equipment.

site planning The process of positioning the Base Stations, antennae, and other hardware in the system to maximize coverage for the portable telephones and minimize the number of Base Stations required for acceptable performance. Refer to *Meridian Companion Site Planning Guide* for more

information on site planning.

System LID The System Access Logical Identifier (LID) is a four-digit hexadecimal number by which the system identifies itself to portable telephones and which the portable telephones use to request service from the system. Only the installer can change the System LID.

System Reevaluation The process which automatically assigns Base Stations to cells and defines the cell configuration.

System Security Number (SSN) The unique number that identifies each Meridian Companion system.

TCM Time Compression Multiplexing.

Time Compression Multiplexing (TCM) unit number A four-digit number that identifies a card and unit (cc-uu). In Meridian Companion, one port supports the Administration Terminal or a RAD connected to an administration PC. (If a system has an Administration Terminal and a RAD, each has a separate port.) The other ports support Base Stations and portable telephones.

TN Terminal Number. A port on a Meridian 1 system to which a particular telephone set is connected.

UTAM Activation Code Activates the wireless capability on a new system and in system upgrades involving a change to the number of Base Stations supported.

UTAM Recovery Code This code will clear a system of its “disablement” status and restore the Meridian Companion system to its previous radio capacity.

UTAM Inc. Unlicensed Transition And Management for Microwave relocation in the 2 GHz band. This is the private body appointed by the FCC to coordinate the deployment of Personal Communication Services in the Unlicensed spectrum and manage the relocation of existing users in that spectrum.

Version number See system version.

WTN Wireless Terminal Number. A four-digit number that maps to a Terminal Number (TN) and can be assigned to a portable telephone.

Index

A
activating
new system 96
wireless communications 197
activation code 93
adjusting contrast
Administration Terminal 76
contrast level 76
Administration log
checking recent alarms 140
checking repetitions 140
checking time 140
entering 139
erasing 139, 141
event messages 139
recording messages 139
Administration password
changing 90
default 90
erasing 90
recording 91
unauthorized access 90
Administration programming
changing the password 90
ending a session 77
entering a password 76
entering a session 76
Master Registration 120
radio loss handling 116
setting the date 88
setting the time 87
system administrator 90
Transfer on Radio loss 116
Administration Terminal
alarm messages 77
connection to Controller 77
contrast 76
device 79
dialpad buttons 74
display 74
display buttons 74
displaying system date 88
displaying system time 87
exception message 168
Feature button 74
Maintenance programming 127
navigation buttons 75
operating 76
port connection 77
registering portables 119
Release button 74
replacing 166
system time and date 87
troubleshooting 176
alarm messages
Event/Alarm log 136
recording 77
reporting 77
system 77
alarms
reporting 141
troubleshooting 183

antenna
external 36
outdoor external 38
antenna setting
System Reevaluation 142
antenna type
changing 84
displaying 84
running reevaluation 84
setting 84

B

Base Station
adding 151
and CMCC 78
and CMRC 78
and radio coverage 152
cabling 27
cabling to RPI 27
changing configuration 143
clearance 14
connections 78
deployment 151
device 79
increasing coverage area 151
installing 12
local power 33
mounting 14
moving 151–153
number in cell 151
plug-top power supply 12
polarity 30
present on system 78
registering portables 119
replacing a defective 153
software 69
status 78
System Reevaluation 142
TCM port 79
troubleshooting 177
wiring length 12
Base Station address
adding to site plan 101
BIX connector board 28
BNC connectors 38
button caps 75
B03 gain values
changing 80
digital signal paths 80
displaying 81
entering a new 81
negative 81
positive 81
telephony data 81

C

cabling
from Base Station to RPI 27
card LED behavior 175
card status
checking card type 130
checking state 130
idle 78
Meridian 1 system 103
verifying 78
cards
installed on system 78
troubleshooting 173
cell assignment
and radios 83
displaying 102
floor plan 100
identifying for a radio 102
not assigned 102
viewing 101
cell boundary value
and RSSI 100
high-power mode 100
low-power mode 100
cell center 100
changing
Installer password 89
system date 88
system time 87
changing defaults
B03 gain values 79, 80
Delay to Dial 79
side tone 79, 81

telephony data 79
changing the LID 85
CMCC
checking status 78
connecting a Base Station 78
replacing 164
CMLC
adding to system 154
checking status 78
CMRC
adding to system 154
checking status 78
connecting a Base Station 78
CO line interface 198
coaxial cable
and external antenna 36
code
UTAM activation 70, 93
coldstart 69
Configuration programming
antenna type 84
B03 gain values 81
cell assignments 101
changing Installer password 88
changing LID 85
ending a session 77
entering a session 76
portable credits 122
radio cell assignment 102
Show cell 102
software codes 96
System Reevaluation 146
telephony data 81
configuring
a terminal number (TN) 105
Meridian 1 system 103
configuring portables
with X11 releases 104
contrast
adjusting 76
critical point 100

D

default
Administration password 90
Installer password 88
Registration password 91
default password
Administration programming 76
Configuration programming 76
deployment 101
deregistering
wireless terminal number (WTN) 123
device
Administration Terminal 79
Base Station 79
RAD 79
dialpad buttons
entering LID values 86
feature codes 74
digital signal paths
changing 80
directed RSSI
measuring for portable 122
disabled system
activating 150
disabling
wireless system 101
display buttons
options 74
displaying
antenna type 84
B03 gain values 81
system LID 85
telephony data 81
downloading software 69
dropping calls 115

E

entering
Administration password 90
LID values 86
portable credits 96
UTAM activation codes 96
entering password
Administration programming 76
Configuration programming 76
Installer programming 76

erasing system data 71
event
    Administration log 139
    severity number 136, 139
event messages
    reporting 141
    troubleshooting 190
Event/Alarm log
    checking recent alarms 137
    checking repetitions 138
    checking time 137
    entering 137
    erasing events 136
    erasing the log 138
    recording messages 136
exception
    nonrecoverable inconsistency 169
    recoverable inconsistency 168
expansion cards
    adding 154
    replacing 160
external antenna
    BNC connectors 38
    mounting 36
    specifying on system 84

F

FCC
    certified equipment 199
    telecom compliance 200
Feature button
    and exceptions 168
feature codes
    entering 74
Federal Communications Commission
    See FCC
floor plan
    cell assignments 100
    cell center 100
    critical point 100

G

generating
    LID 85

H

hand-off
    radio coverage area 99
hardware
    installing 11
hearing aids
    and portable telephones 202
high-power mode
    cell boundary value 100

I

idle cards 78
initialization 69
initializing
    the system 69
Installer password
    changing 88
    default 88
    recording 89
    unauthorized access 89
Installer programming
    entering a session 76
    entering password 76
    menus 76
    see also Configuration programming
installing
    Base Stations 12
    external antenna 36
    hardware 11
    lightning surge arrestor 36
    outdoor external antenna 38
    plug-top power supply 12
    RPI unit 25
interference 201
invalid code
    UTAM 97
IPE card slots
    disabling 157

L

LD 97
    class of service 104
LED behavior
    cards 175
    system 174

LID
changing 85
default 85
setting 85
LID values
entering 86
valid 86
lightning surge arrestor
installing 36, 198
local power
Base Station 33
logical identifer (LID)
see LID
low-power mode
cell boundary value 100

M

maintenance
Administration Terminal 74
maintenance cable 163
Maintenance programming
Administration log 139
alarm messages 136
card states 131
card status 130
checking system status 128
checking system version 128
displaying release number 128
displaying software version 128
Event/Alarm log 136, 137
features 127
system states 129
TCM status 134
WTN status 132
maintenance session
verifying cards 78
Master Registration
default 120
disabling 120
enabling 120
MDF wiring 78
Memory Reset
entering code 70
erasing system data 71
reinitializing system 70
Meridian 1
card maintenance 126
card status 103
extended features 104
LD 97 103
privacy feature 104
ringer default 103
Meridian 1 system
configuring 103
mobility data
assigning cells 83
programming 83
monitoring
wireless communication 93
mounting
a Base Station 14
an RPI 25
external antenna 36
plug-top power supply 33

N

navigation buttons
arrows 75
searching 75
new system
activating 96

O

operating
Administration Terminal 76
outdoor external antenna
installing 38

P

password
Administration 90
Installer 88
Registration 91
PC Interface Card
installing 42
plug-top power supply
connector 34
installing 12
mounting 33

polarity 30
port address
and cards 78
Portable Credit Code
recording 96
portable credits
adding 148
entering 96
number available 122
obtaining 148
verifying 122
portable telephone
and changing LID 85
and credit codes 93
configuring using X11 releases 104
credits available 119
displaying RSSI 99
LID 85
losing a link 115
making calls 122
maximum on system 93
measuring directed RSSI 122
receiving calls 122
registration 119
Registration password 91
replacing 122, 166
side tone 81
system time and date 87
Transfer on Radio loss 115
troubleshooting 180
power interruption
disabled system 150
troubleshooting 173
power supply connector
position of 33
programming
Feature button 74
Installer 76
mobility data 83
overview 195
Release button 74
system date 88
system time 87
system time and date 87
telephony data 79
the system 73

R

RAD
device 79
replacing 166
troubleshooting 182
radio
cell assignment 102
radio assignments
viewing 101
radio coverage
and hand-off 99
radio credits
adding 149
software codes 149
UTAM Activation Code 149
verifying 182
radio frequency interference 201
radio loss handling
programming a default 116
transferring calls 116
radios
assigning a cell 101
assigning cells 83
identifying 83
reevaluation
see System Reevaluation
registering
portable telephones 93
registering portables
and portable credits 119
registration 120
Registration password
changing 91
default 91
entering a new 91
recording 92
unauthorized access 91
Regression Code 167
reinitializing
Memory Reset 70
Release button 74

relocating
and reevaluation 157
existing system 157
remote power interconnect unit
see RPI
REN
terminal device 202
repair facility 202
replacing
CMCC 164
expansion cards 160
portable telephone 166
RAD 166
ROM card 161
RPI power unit 165
RPI unit 164
reporting
alarms 141
events 141
ringer equivalence number
See REN
ROM card
replacing 161
System Reevaluation 161
RPI
and polarity 30
BIX connector board 28
cabling to Base Station 27
DC backup power 32
installing 17–25
mounting 25
output connections 29
powering down 31
powering up 31
replacing 164
troubleshooting 178
upgrading 22, 32
wiring 27
RPI configurations
large installations 20
small installations 19
RPI power 78
RPI power unit
replacing 165
RSSI
and cell boundary value 99
observing 99
RSSI measurements 100

S

searching
using navigation buttons 75
severity number
and events 136, 139
Show cell
viewing cell assignment 102
side tone
changing 81
default 81
portable telephone 81
software
Base Station 69
downloading 69
new installations 69
software codes
radio credits 149
SSN 96
SSN
displaying 96
recording 96
state
idle cards 78
system 90
alarm messages 77
and UTAM codes 70
Base Station location 79
cards installed 78
coldstart 69
initializing 69
LID 85
Memory Reset 69
programming 73
registering portables 93
relocating 157
startup 69
system access
LID 85
system coldstart 69

system date 87
system default
radio loss handling 116
system initialization
description 69
exception 168
system installation
verifying 99
system LED
initializing expansion cards 158
system LED behavior 174
system LID
changing 85
displaying 85
system programming
Administration Terminal 74
system recovery
entering codes 166
Regression code 167
System Reevaluation
and antenna settings 142
and Base Stations 142
canceling 145
changing configuration 143
disabling system 142
dropping calls 145
run times 145
running 143
scheduling 146
setting the date 147
setting the time 146
system security number
see SSN
system startup
nonrecoverable inconsistency 169
recoverable inconsistency 168
system states 129
system time 87
system time and date
when to reset 87

T

TCM connections
and polarity 18
TCM device states 135
TCM port 79
TCM status
checking device status 134
checking device types 134
device firmware 134
device software 134
displaying TCM 79
entering device number 134
telephony data
B03 gain values 79, 81
changing defaults 79
defaults 79
Delay to Dial 79
programming 79
side tone 79, 81
terminal number (TN)
configuring for portable 105
Transfer on Radio loss
dropping calls 115
entering a number 116
losing a link 115
options 115
troubleshooting 171–172

U

upgrading an RPI 22, 32
UTAM
codes 70
test 70
UTAM Activation Code
entering 96
invalid code 97
recording 96
UTAM activation code 93
UTAM Inc.
monitoring wireless activity 93
UTAM Recovery Code
activating disabled system 150
obtaining 150
system on-line 150

V

valid system LID 86
verifying

card status 78

W

wireless communication
activating 93
and UTAM Inc. 93
wireless communications
approval 197
wireless privacy
setting 107
wireless system
deployment 101
disabling 101
wireless terminal number (WTN)
checking status 132
deregistering 123
states 133
verifying 121
wiring
an RPI 27

X

X11 release 15-18
and CPND 109, 113
X11 release 19
and CPND 109, 113
X11 release 20B
and data blocks 110, 114
printing features 108
printing new values 107
printing terminal numbers 108, 112
printing values 107, 112
X11 releases
configuring portables 104
programming options 107
verifying configuration 104

Meridian 1

Meridian Companion

Installation and Maintenance Guide

Publication Number: 553-3601-200
Document Release: Standard 7.00
Date: November 1998
Printed in Canada

NORTEL NETWORKS
How the world shares ideas.