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Millennium Card-based terminals:

# Installing terminal hardware

Document number: P0883898 Document issue: 00.01
Document status: Standard Date: June 1998

**Terminals covered by this document:**

- **Card terminals**
- **Inmate terminals**



NORTEL
NORTHERN TELECOM

# Millennium terminals installation, operation, and maintenance documentation modules

The table below shows all the customer-orderable books in the terminal installation, operation and maintenance suite. These books can be ordered separately as modules or in sets as documentation kits.

| Title | Order code |
|---|---|
| **All terminals** | |
| Millennium terminals provisioning guide | A0685011 |
| Millennium terminals: using the craft interface | P0883893 |
| Millennium terminals: maintenance troubleshooting | P0883894 |
| Millennium terminals pocket troubleshooting guide | P0883895 |
| **Multi-pay-based terminals** | |
| Millennium Multi-pay-based terminals: installing terminal hardware | P0883896 |
| Millennium Multi-pay-based terminals: replacing parts | P0883897 |
| **Card-based terminals** | |
| Millennium Card-based terminals: installing terminal hardware | P0883898 |
| Millennium Card-based terminals: replacing parts | P0883899 |
| **Desk terminals** | |
| Millennium Desk terminals: installing and replacing hardware | P0883900 |
| **Also available:** | |
| Accessory kit: binder, cover, and spine | A0737727 |
| Complete assembly kit (one each of all modules) | A0737720 |
| Multi-pay terminal documentation kit | A0737722 |
| Card terminal documentation kit | A0737723 |
| Desk terminal documentation kit | A0737725 |

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# Publication history

## June 1998

This is the standard release of the installation procedures for Millennium Card and Inmate terminals reflecting the new modularized concept for the NTP information.

This new format combines the installation procedures for all Card-based terminals, including the Millennium Inmate terminal. Most installation procedures are the same for all terminals. However, the Inmate terminal requires that a portable display be installed to view the craft interface for installation and maintenance routines. This procedure is discussed in a separate chapter for easy reference.

Also included in this release is a flowchart noting the key points of the installation procedure to allow experienced installers to move quickly through the installation procedure.

## April 1997

This was the standard release for Millennium card terminals based on firmware release MTR 1.9. This guide reflects an upgrade of the Millennium Manager platform to MSR 2.0.

The MSR 2.0 release is backwards compatible with MSR 1.6, 1.7, and 1.8 terminal vintages, therefore the previous versions of this document and support documents still apply for those terminals.

# Table of contents

## Figures



## Tables

# 1 Introduction

This document is intended for the craftsperson who installs Millennium Card-based terminals on-site and connects them to the CO line.

**Inmate terminal:** This manual also includes the procedure for installing a portable display so the craft interface can be viewed.

## How this guide is organized

*Millennium Card-pay-based terminals: installing terminal hardware* is organized into the following sections:

**Chapter 1:** **Introduction** describes the guide contents and gives an overview of the module.

**Chapter 2:** **Pre-installation overview** describes pre-installation issues such as selecting a site, whether the furniture needs a backboard or not, and whether there are components which can be installed before the terminal is released to the field, such as a lock or an inferred answer supervision (IAS) module.

**Chapter 3:** **Mounting the terminal** provides instructions about mounting the terminal onto a backboard, either directly on the wall or inside furniture and how to connect the central office (CO) line tip, ring, and supplementary power leads to the rear

terminal PCP of the terminal. When you are finished the terminal should be ready for the INSTALL routine to be run.

**Chapter 4:** **Installing a portable display** describes how to install and remove the portable display which is required to run the INSTALL routine for the Inmate terminal.

**Chapter 5:** **Installation flowcharts** provides quick-view flow charts for installing a  Card terminal.

**Appendix A:** **Regulatory notes** lists the Canadian and American regulatory information which affects these terminals.

**Appendix B:** **INSTALL routine quick reference** provides the basic prompts of the INSTALL routine, as well as a section describing the most common errors which occur during the INSTALL routine. For detailed information about the INSTALL routine, refer to *Millennium terminals: using the craft interface*.

**Index:** provides a comprehensive cross-reference guide for this module.

# 2 Pre-installation overview

This chapter provides an overview of the hardware provisioning that must be met for successfully installing the terminal on-site. For detailed provisioning information refer to the *Millennium terminals provisioning guide*.

Attending to these details prior to deploying the terminals will assist in ensuring that the installation goes smoothly.

## Installation overview

The major steps to installing Millennium Card-based terminals are listed in the following sections.

### Setting up the site

Before you install the terminal, both the terminal and the site must be properly prepared.

This chapter describes:

- selecting the site
- ensuring the site provisioning is correct
- ensuring any peripheral equipment required is connected to the line
- ensuring locks and IAS modules have been installed, if required

## Installing the terminal on-site

When the site is ready, the terminal is mounted and connected to the CO line. Chapter 2 describes these procedures.

- installing a backboard
- attaching the terminal to the backboard or to standard furniture backboards
- connecting the terminal to the outside line

## Installing and testing terminal function

Once the terminal is installed, the function tables must be downloaded into the terminal using the craft interface.

The craft interface is described in *Millennium terminals: using the craft interface*, which describes the following final steps to activating the terminal functions:

- installing software in the terminal
- testing the terminal

# Selecting a site

Follow the standards and guidelines of the operating company when selecting a site.

As a guideline, the site should be:

- easily accessible for public use
- adequately lit
- private for the user
- free from excessive noise or vibration
- away from grease, smoke, and dust
- away from moving machinery, piled merchandise, narrow aisles, and stairways
- at least 152 mm (6 in.) from neon lights, transformers, and other equipment with inductive effects

- inexpensive to repair if the terminal is removed
- close to a supplementary power source that is not accessible to the public, to prevent vandalism

# Determining backboard requirements

The Millennium Card terminal can be mounted in recessed and non-recessed furniture and Jaro tubes.

- If a backboard exists, but does not fit the Millennium terminal pattern, an adapter kit can be ordered with the terminal.
- It is also important that the key lock and the T-tool aperture on the side of the terminal are easily accessible for maintenance purposes. If the furniture is too deep for this to occur, spacers can be added to bring the terminal forward. A spacer kit can be ordered from your Nortel Millennium sales agent.
- If the site selected does not already have a backboard installed, a backboard must be ordered when the terminal is ordered.

Figure 2-1 shows a diagram of the Millennium backboard.

## Selecting the proper fasteners

Table 2-1 lists the recommended fasteners for common wall and furniture materials and the minimum number of fasteners recommended to be installed to ensure the terminal is secure.

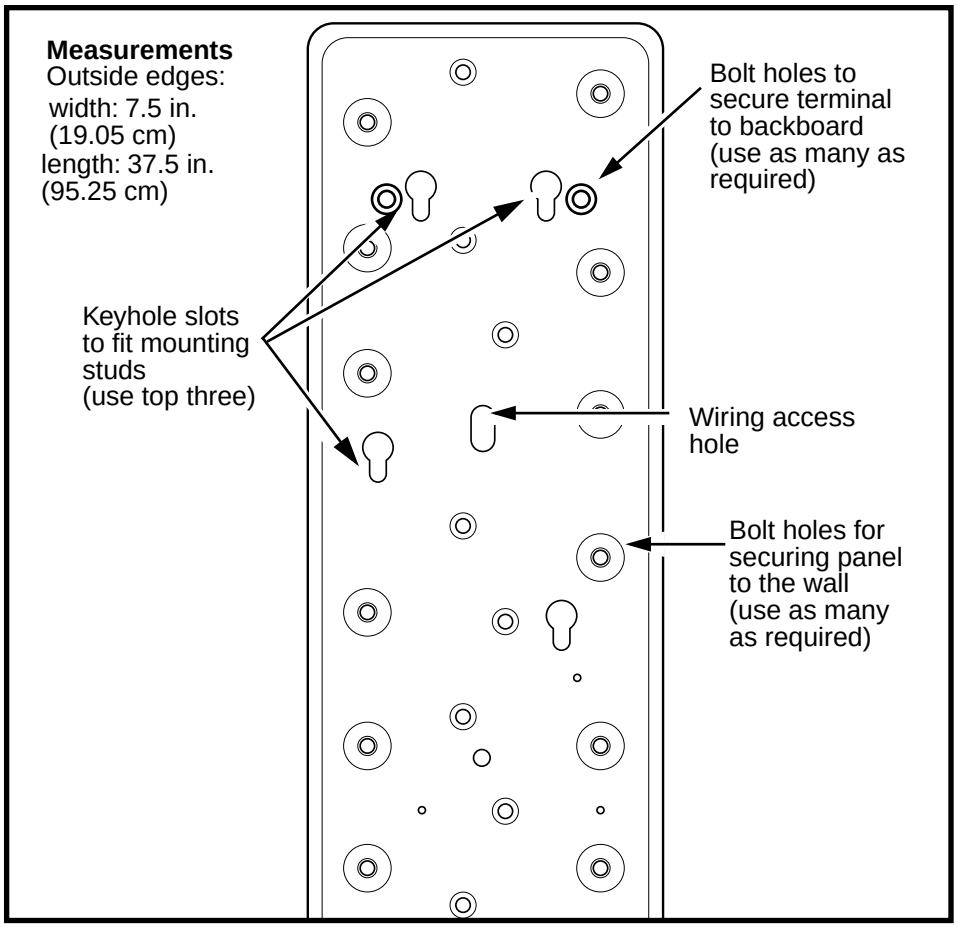
**Table 2-1: Fasteners for backboards**

| Surface | Hole size | Size and type of fastener | Min. # |
|---|---|---|---|
| Softwood | 0.125 inch (1/8 inch) or no. 30 | 1-3/4-inch no. 14 FH wood screw | 7 |
| Hardwood | 0.125 inch (1/8 inch) or no. 30 | 1-3/4-inch no. 14 FH wood screw | 7 |

**Table 2-1: Fasteners for backboards (continued)**

| Surface | Hole size | Size and type of fastener | Min. # |
|---|---|---|---|
| Masonry, concrete, brick | 0.3125 inch (5/16 inch) | 2-inch no. 14 wood screw in no. 16 plastic anchor | 7 |
| Cinder block, hollow tile | 0.75 inch (3/4 inch) | 1-1/4-inch X 4-inch RH toggle bolt | 6 |

**Figure 2-1: Backboard for terminal**



# Terminal site specifications

This section provides specification information about the Millennium Card-based terminals.

These specifications must be met for the terminal to work to its optimum level.

- Environmental requirements
  Operating temperature between: -40 °C and +60 °C
- Line requirements

  Standard analog loop; not a coin line

  Answer detection is required. If it is not available on the line, an inferred answer supervision (IAS) module must be installed in the terminal.

  **Inmate terminal:** Does not require answer supervision, but it is recommended.
- Power consumption: 8.6 W maximum
- Supplementary power requirements
  - — Power source: Local power using a wall plug-in class 2 transformer (110 V AC), or direct current with class 2 output from a central location.
  - — Recommended source: 0.5 A, 24 V DC ±15% (±3.6 V DC)
  - — Acceptable start-up voltage: 19 V DC to 30 V DC

  ***Note:*** Output resistance should be less than 10 Ω.

## Cable length specifications

Table 2-2 gives the specifications for the cable length from the terminal to the power supply based on wire size for a single unit.

***Note:*** Irregular performance could result if cables are too long, caused by increased voltage drop across the cable. In this instance, some terminal functions may still work, however, when increased power is required, for example, for a modem call the terminal will terminate the transaction and power down and up.

**Table 2-2: Cable length chart**

| Gauge | Maximum length | Comment |
|---|---|---|
| #26 | 41.8 m (137 ft) | See warning below |
| #24 | 66.5 m (218 ft) | See warning below |
| #22 | 105.6 m (346 ft) | |
| #20 | 168 m (551 ft) | |
| #18 | 226.7 m (875 ft) | |
| #16 | 424.3 m (1392 ft) | |
| #14 | 674.8 m (2214 ft) | |
| #12 | 1072.9 m (3520 ft) | |

### Cable length warning

The output impedance of the power supply should be less than 10 Ω. Excessive cable lengths may result in terminal power problems.

### Answer supervision warning

It is possible answer supervision will be affected if a terminal is connected to the central office (switch) with 100 m of cable or less.

**Problem:** A power spike causes the terminal to connect to the called party, then disconnect inappropriately.

**Solution:** To correct the situation, try padding each side of the line (Tip and Ring) with additional resistance. Suggested padding is 500 ohm

# Suggested tools and equipment

Table 2-3 lists the tools and equipment required for installing, maintaining, and testing the terminal.

**Table 2-3: Recommended tools and equipment**

| Tool | Use to |
|---|---|
| T-tool /L-tool | open the housing assembly |
| upper housing and lower housing keys | unlock the terminal housing; used in conjunction with the T- and L-tool to open the terminal |
| butt-end test set | test the line to the terminal, and to use during fault-clearing procedures |
| multimeter | measure the voltage of the supplementary power supply |
| ESD wrist strap | protect electronic components from electrostatic discharge (ESD) damage |
| dry type cleaning card | clean the card reader. |
| test cards: mag stripe and smart card | test the ability of the terminal to process card calls |
| knuckle saver (lifter) | remove external instruction cards |
| small slot-head screwdriver | attach the tip and ring leads and the supplementary power supply leads to the terminals on the rear terminal board |
| #1 type 1A cross-recess screwdriver | tighten and loosen M3 screws and to remove the number-card window |
| #2 type 1A cross-recess screwdriver | tighten and loosen M3.5 screws and M5 screws |
| chip puller | replace control and voice chips on the control PCP |
| external portable display | access craft interface prompts on the **Inmate terminal** |

# Installing peripheral equipment

Machines, such as TDD/TTY (electrotype for the deaf) units are tied into the line outside the terminal. Refer to the instructions accompanying the particular machine for the installation and operation instructions. Otherwise, follow the installation procedures given by the operating company installing the devices.

**Making a call using such a device:**

1. A call is placed from a Millennium terminal. The sequence dialed indicates that the call is being directed to another TDD device.

2. When the call goes through and connects with a similar TDD/TTYdevice at the other end, the device is activated. The handset is left off-hook for the duration of the call.

3. When the call is finished, the handset on the terminal is replaced on-hook.

# Pre-mounting considerations

The following section describes optional components which can be installed before the terminal is mounted either during manufacture or by the operating company when they prepare the terminals for distribution.

You will need to test these features after installation.

## Installing an IAS module

Millennium terminal billing functions require answer supervision to be present on the line. If this feature is not available from the outside line, an IAS module must be installed in the terminal.

The exception to this is the Inmate terminal, which can function without answer supervision, although answer supervision is recommended for this terminal.

- The IAS module connects between the outside line and the rear terminal PCP.
- Power must be disconnected from the terminal to install this module.

### Positioning the IAS module

The following steps describe how to position the module in the terminal and connect it to the rear terminal PCP.

1. This procedure assumes you are installing the module before you mount the terminal.

2. On the inside of the terminal front housing, check the placement of the IAS board mount.

   Leave the protective paper on the board mount, and position the mount on the inside of the front housing, underneath the card reader. Refer to Figure 2-2.

   a) Set the mount against the front housing, about 25 mm (1 in.) above the bottom of the front housing and centered horizontally. Mark an edge.

b) Ensure that connectors J1 and J2 are facing to the left.

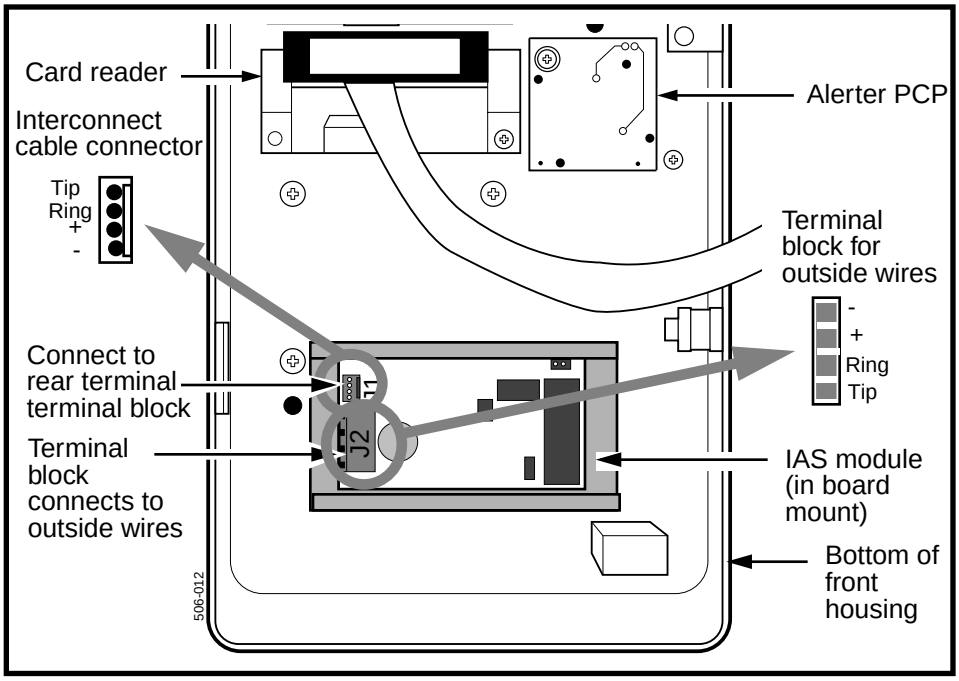
c) Take the board mount out; remove the protective paper from the adhesive foam on its back.

d) Firmly press the board mount into the terminal, where you placed it in the previous sub-steps.

3. Insert the interconnect cable into J1 on the IAS PCP. This is the cable which came with the IAS module.

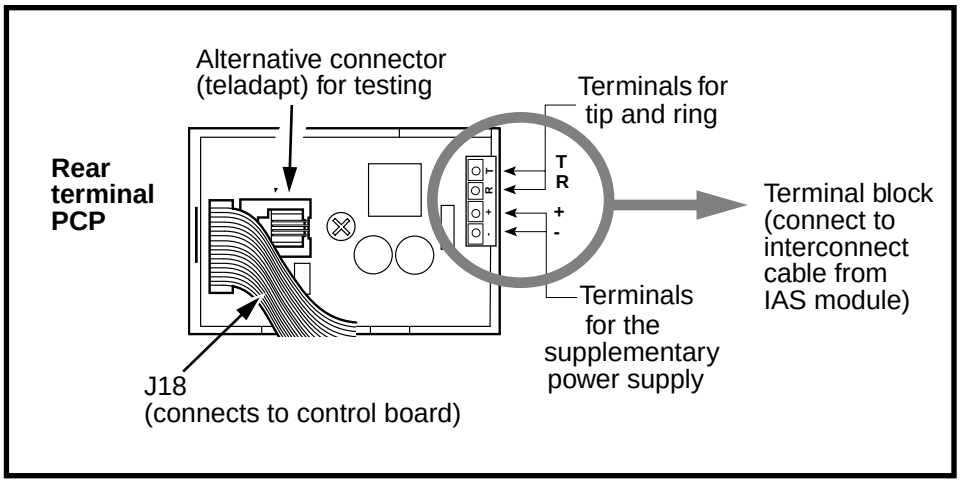
   Ensure that the cable fits into the connector so the black edge of the cable is in the tip position. Refer to Figure 2-2.

**Figure 2-2: Locating the IAS module**




4. Connect the wires on the other end of the interconnect cable to the terminal block on the rear terminal PCP. Refer to Figure 2-3.

**Figure 2-3: Wire positions on the rear terminal PCP block**




5. You are now ready to install the terminal on the backboard. Wiring the ISWs to the IAS module will be described later in this chapter. Refer to **Connecting power to an IAS module** on page 3-23.

## Installing a lock on the terminal

The housing lock of the Card-based terminal is customer-specific. If it was not mounted at the factory, install the lock as described below:

1. Ensure that the key operates the lock.

2. Unfasten the terminal housing by inserting a T- or L-tool into the housing aperture and rotating the tool counterclockwise until it stops turning.

   This disengages the tiebars securing the housing.

3. Open the terminal housing. Refer to **Unlocking and opening the terminal** on page 3-7 for a detailed description of how the housing opens.

The housing opens on two pivot hinges.

| **See this:**  | If the terminal has not yet been installed in furniture or on a wall, make sure you support the housing to keep it from falling. |
|---|---|

4. From the outside, insert the lock assembly in the double D hole in the front housing assembly.
   Ensure that the key slot points to the open side of the front housing.

5. Fasten the lock in place with the large flat nut, using a 7/8-inch wrench to tighten the nut.

6. Place the cam over the machine thread, which has two flattened sides, which fit into the hole in the cam.

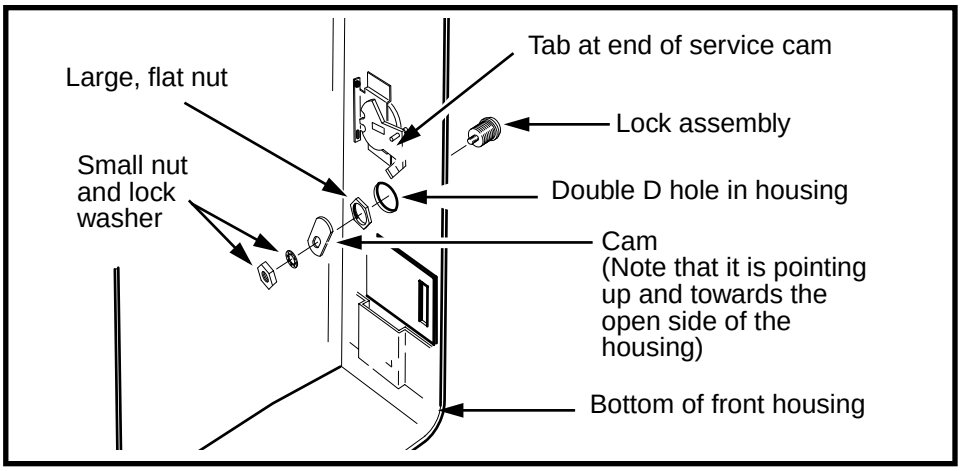
   - The cam extension should be pointing up.
   - This extension should rest against the black tab at the end of the service cam above it.
     ***Note:*** The T-tool is in the open position.

   Refer to Figure 2-4.

7. Push the locking washer over the machine thread.

8. Fasten the cam in place with the small nut, using a 7/16-inch wrench to tighten it down.

**Figure 2-4: Installing the terminal housing lock**




9. Place the key in the lock and rotate it clockwise until it stops. This is the open position.

10. Close the terminal housing.

11. Lock the housing by turning the t-tool clockwise and the key counterclockwise, until they stop.

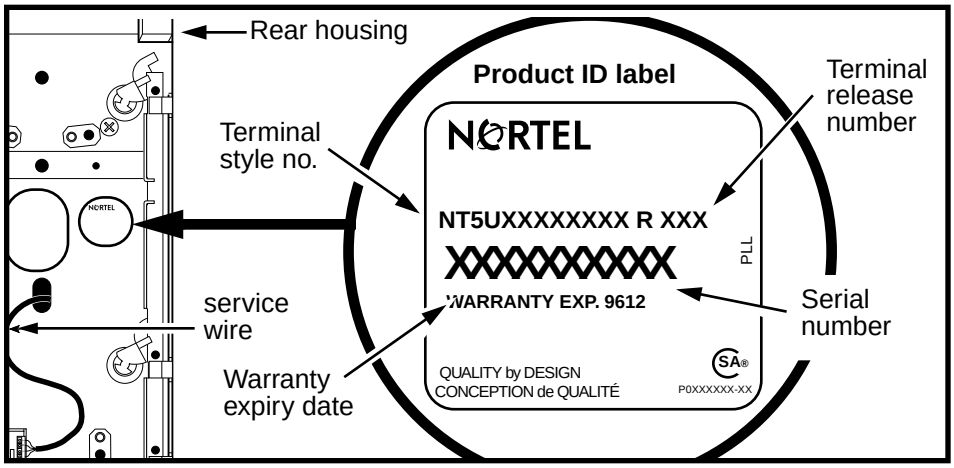
# Identifying your terminal type

Each terminal has a **product ID label** located in the top right-hand corner on the outside, and somewhere on the inside, of the rear housing.

Refer to Figure 2-5.

- This label tells you the type of terminal and the release number, which you may need to refer to when ordering components.
- This label also has the warranty expiry date of the terminal.

**Figure 2-5: Locating the product ID label**



## Telephony/control board identification

Table 2-4 lists the label color and the product engineering code (PEC) that appears on control and telephony PCPs:

**Table 2-4: Telephony and control PCP labels**

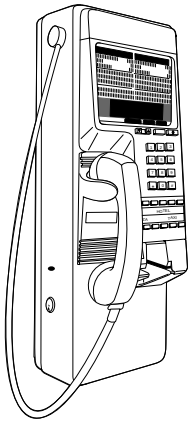
| Board type | PEC | Color |
|---|---|---|
| Datajack telephony PCP | NT5U4045 | Yellow |
| MTR 1.7: Datajack control PCP | Will vary | Blue |
| MTR 1.7/1.9: control PCPs, standard and datajack telephony PCPs | Will vary | White |
| Repaired boards | | Green |
| ***Note:*** Boards shipped with new terminals have a PEC which represents the firmware shipped with the board. Replacement boards, shipped without firmware, will have a different PEC. | | |

# Other documentation

For detailed information about provisioning requirements or terminal features refer to:

- for a general description of all Millennium terminals and features, refer to the *Millennium terminals product guide*.
- for provisioning instructions, refer to the *Millennium terminals provisioning guide*.

# 3 Mounting the terminal



This chapter describes the actual process for securing the terminal on the wall or inside furniture, and connecting it to the inside service wires (ISWs).

When you are finished this chapter, the terminal will be ready to register with the Millennium Manager and to obtain a functional table download. This process is described in *Millennium terminals: Using the craft interface* in the chapter on the INSTALL routine.

| **See this**  | This chapter assumes you have followed the proper site provisioning procedures and have checked them with the information in Chapter 1. |
|---|---|

**Inmate terminal:** This chapter also includes cues for installing an external portable display if the INSTALL procedure is to be done as soon as the terminal is mounted and powered up.

This chapter describes the following procedures:

- installing a backboard, if required
- attaching the terminal to a backboard
- checking the inside service wires (ISWs) to confirm the outside line is correct
- connecting the ISWs to the terminal block
- installing optional modules and instruction cards

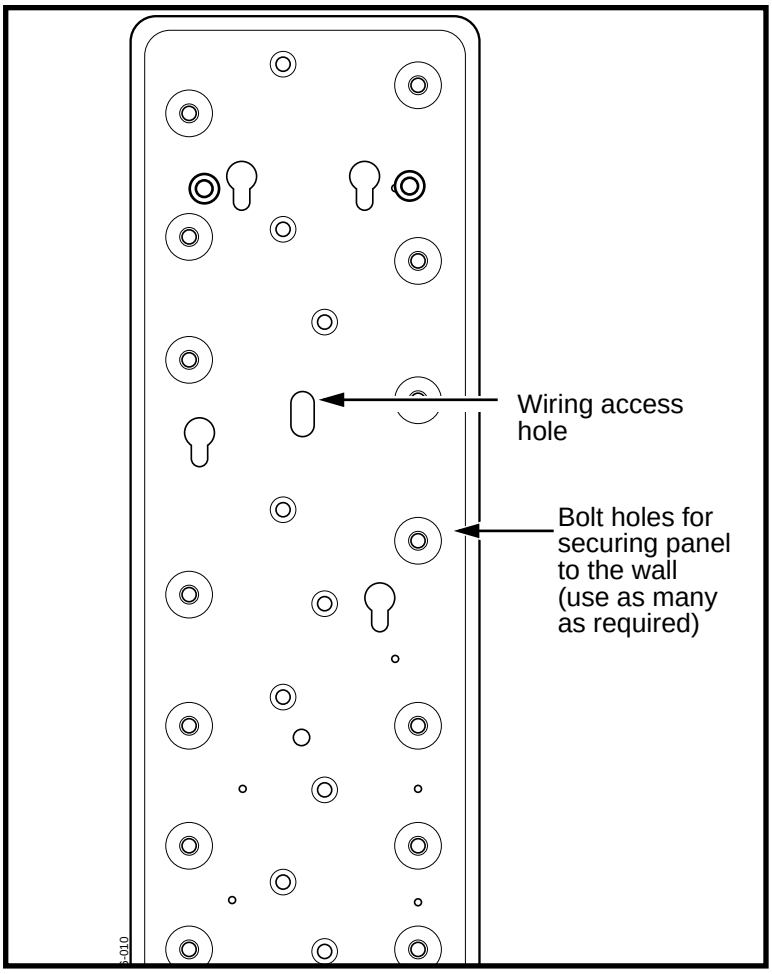
# Mounting the backboard

For a wall-mounted installation, the terminal must be mounted on a vertical surface. A tilt greater than 1.5 degrees in any direction may cause malfunction.

If the furniture you are using does not already have a backboard, you will need to install one.

Figure 3-1 shows a typical Nortel backboard.

**Figure 3-1: Backboard with bolt holes indicated**



Follow these steps to install a backboard to the wall or inside furniture:

1. Select the proper fasteners for the furniture or wall material. Refer to Table 2-1 on page 2-3, if necessary.
2. Mark the wall at the desired height.
3. Guide the station wiring through the wiring access hole in the backboard.
4. Align the backboard so it is vertical.

   ***Note:*** The terminal might not work if there is a tilt greater than 1.5 degrees in either direction.
5. Locate the top edge at the mark determined in **step 2**.
6. Secure the backboard with one fastener.
   Refer to Figure 3-1 for hole locations.
7. Make fine adjustments so the backboard is correctly aligned
8. Mark that position.
9. Hold backboard against the wall or furniture, correctly aligned with the mark, and attach the rest of the fasteners.

# Testing the line to the terminal

Before you install the terminal, you need to ensure that the telephone line is supplying tip and ring and the proper level of supplementary power. These specifications are listed in **Terminal site specifications** on Page 2-5.

- Use your butt-end test set to test the telephone line to the terminal. Attach the set to tip and ring and listen for a hard reversal (answer supervision). If the line does not have answer supervision, you will need to install an IAS module, as described in **Installing an IAS module** on Page 2-9.

- Use a multimeter to measure the voltage of the supplementary power supply.

| **DANGER** | |
|---|---|
|  | **Do not** install a terminal during a lightning storm.<br><br>**Do not** install telephone jacks in wet locations, unless they are designed for wet locations.<br><br>**Do not** touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface |

# Mounting and connecting the terminal

The following sections tell you how to install a Millennium Card-based terminal onto the backboard and how to attach the CO and supplementary power connections.

## A. Positioning the terminal on the backboard

This procedure assumes the backboard is ready and the inside service wires (ISWs) have been checked.

Now you are ready to secure the terminal to the backboard. The following steps describe this procedure.

1. Prepare the inside service wires (ISW) by cutting off the exposed ends and wrapping them with electrical tape.

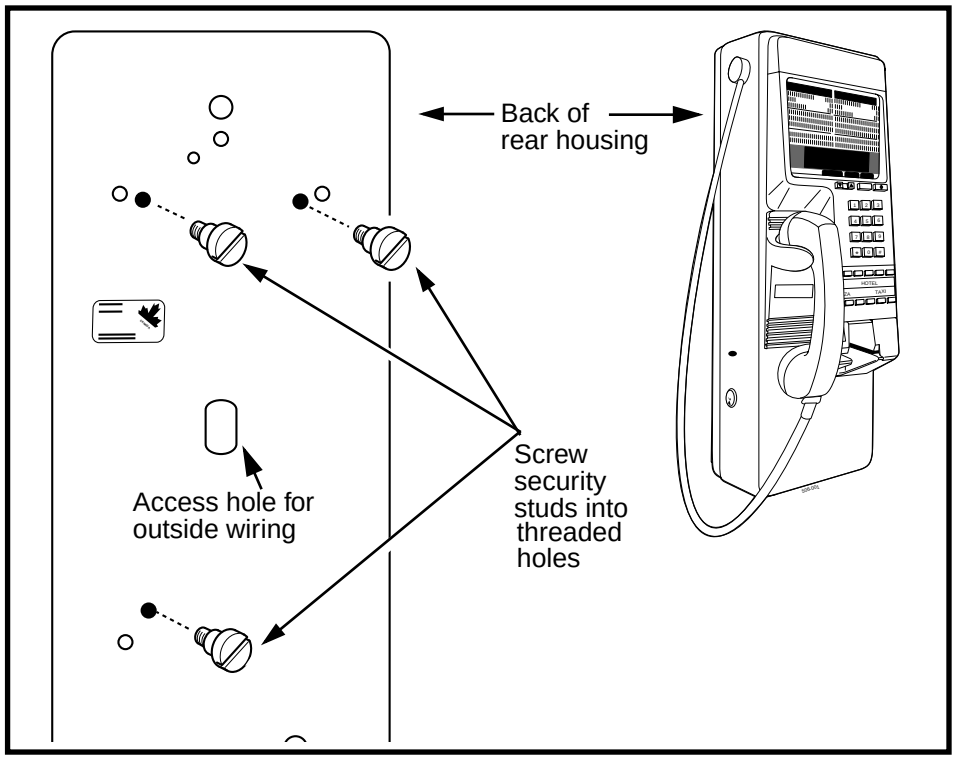
   The tape ensures the wires do not touch the boards when the wires are inserted into the terminal.

| **CAUTION** | |
|---|---|
|  | Observe normal electrical wiring precautions when handling the wires. |

2. Feed the wires through the wiring access hole in the backboard.
3. Insert the security studs in the threaded holes in the exterior of the mounting plate on the back of the terminal. Refer to Figure 3-2.

   ***Note:*** Some terminals are shipped with the studs in place.

**Figure 3-2: Attaching studs to back of terminal**




4. Lift the terminal and position it in front of the backboard.
5. Line up the ISW with the oval wiring access hole in the back of the terminal as you move the terminal towards the backboard.

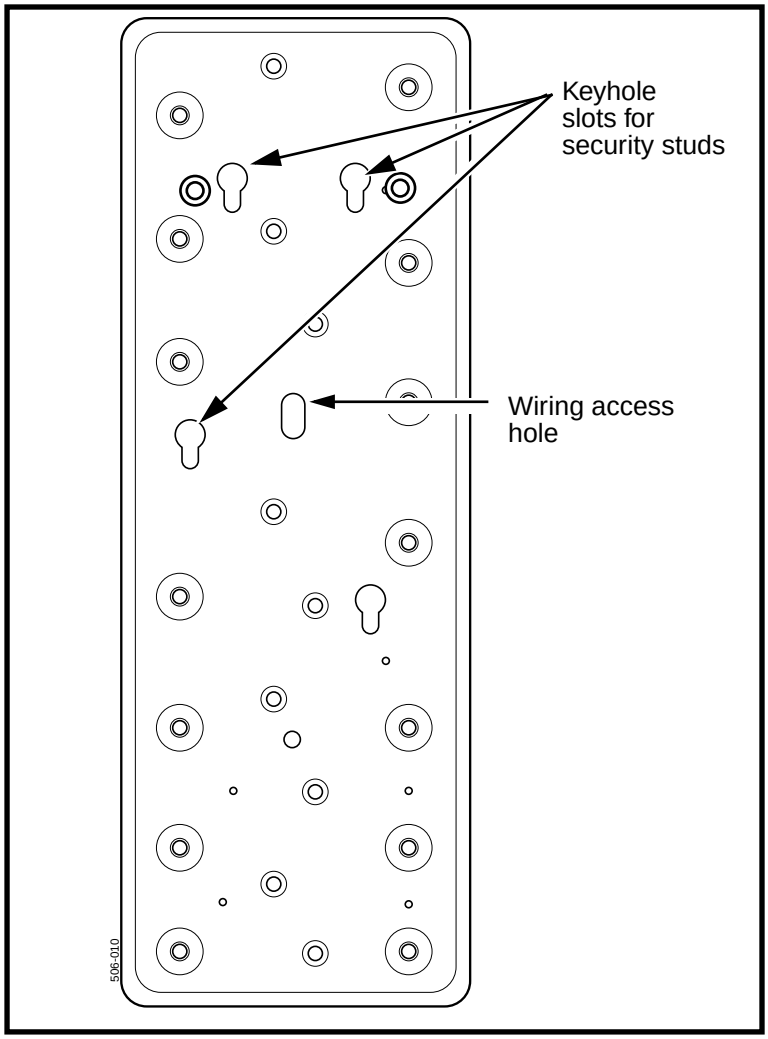
   Ensure the wires are pointed down, to avoid touching the boards inside the terminal.

6. Engage the security studs in the keyhole slots located in the backboard.

7. Allow the terminal slide down into position.

   Refer to Figure 3-3 for keyhole positions on the backboard.

**Figure 3-3: Backboard keyhole slots**

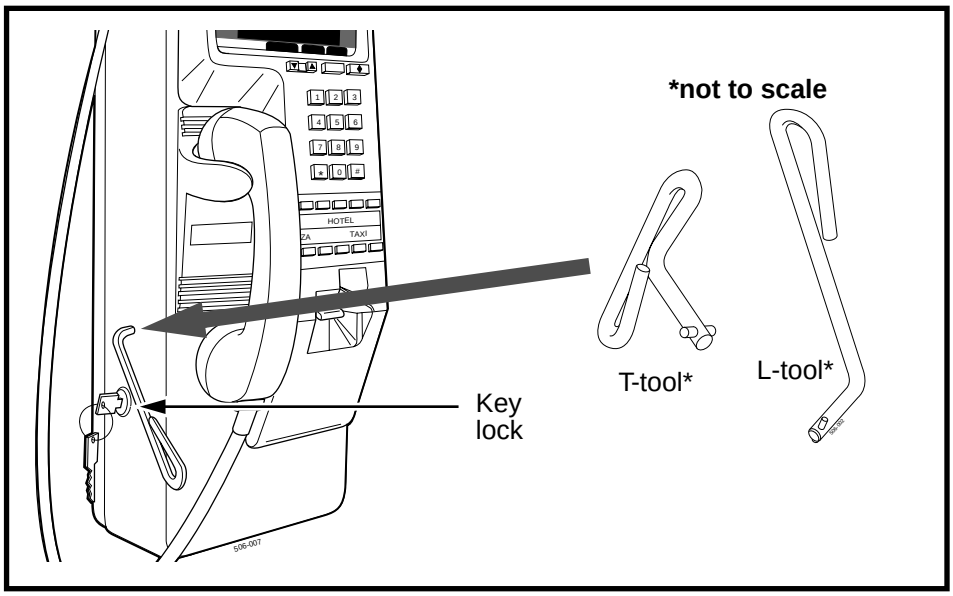


## B. Unlocking and opening the terminal

To access the interior of the terminal, you need to use both the key and a locking tool, either an L- or T-tool. Figure 3-4 shows the position of the locking mechanisms on the terminal.

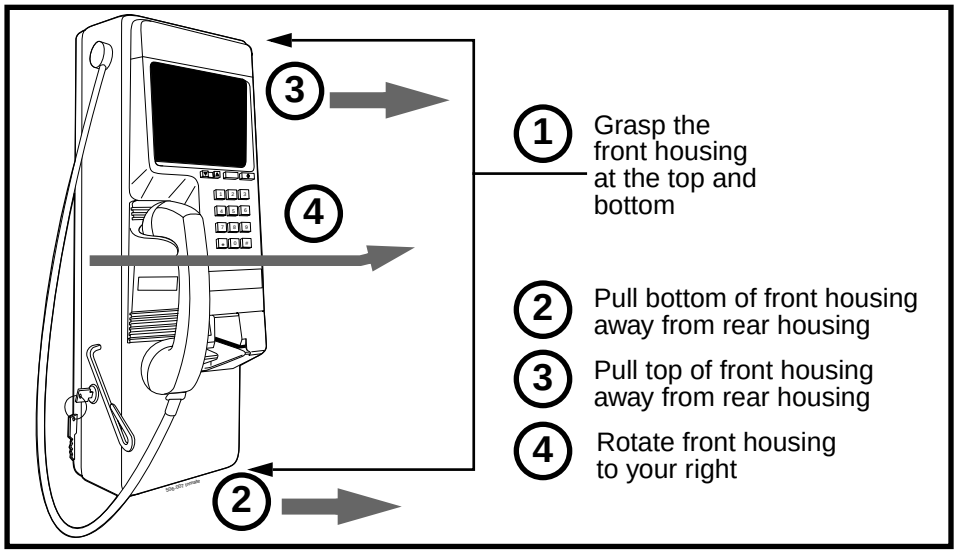
1. Put the key into the key lock on the left side of the terminal.
2. Turn the key clockwise until it stops.
3. Release the housing mechanism.
   Insert the T- or L-tool into the hole above the key lock, and rotate the tool counterclockwise until it stops.
4. Open the terminal housing in the following manner:
   a) Grasp the housing firmly by the top and bottom of the front housing.
   b) Pull the bottom of the front housing away from the back housing.

**Figure 3-4: Locating the T- or L-tool apertures**



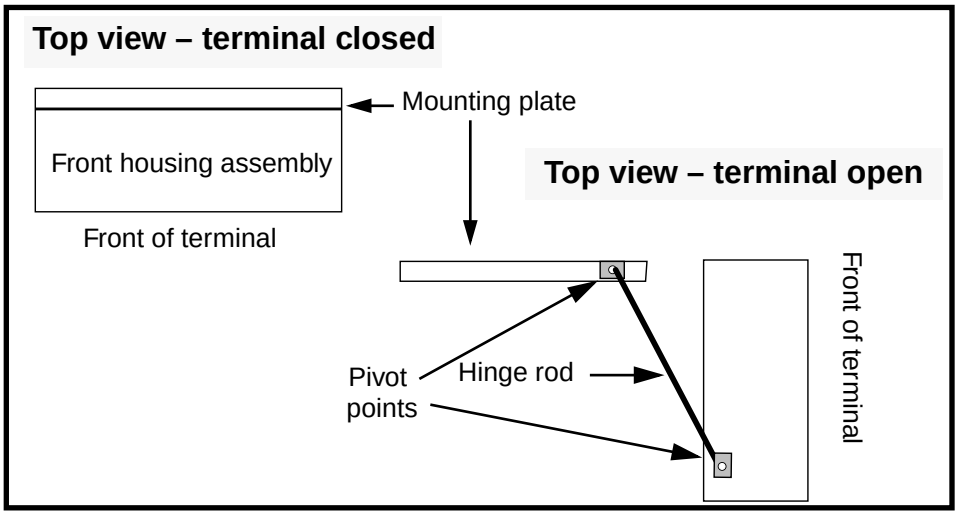
c) Pull the top of the front housing away from the back housing and swing the front housing towards your right, rotated as shown in Figure 3-6.

**Figure 3-5: Proper sequence to open housing**




d) Check that the hinges are still connected inside the terminal.

**Figure 3-6: Opening the housing, overhead view**



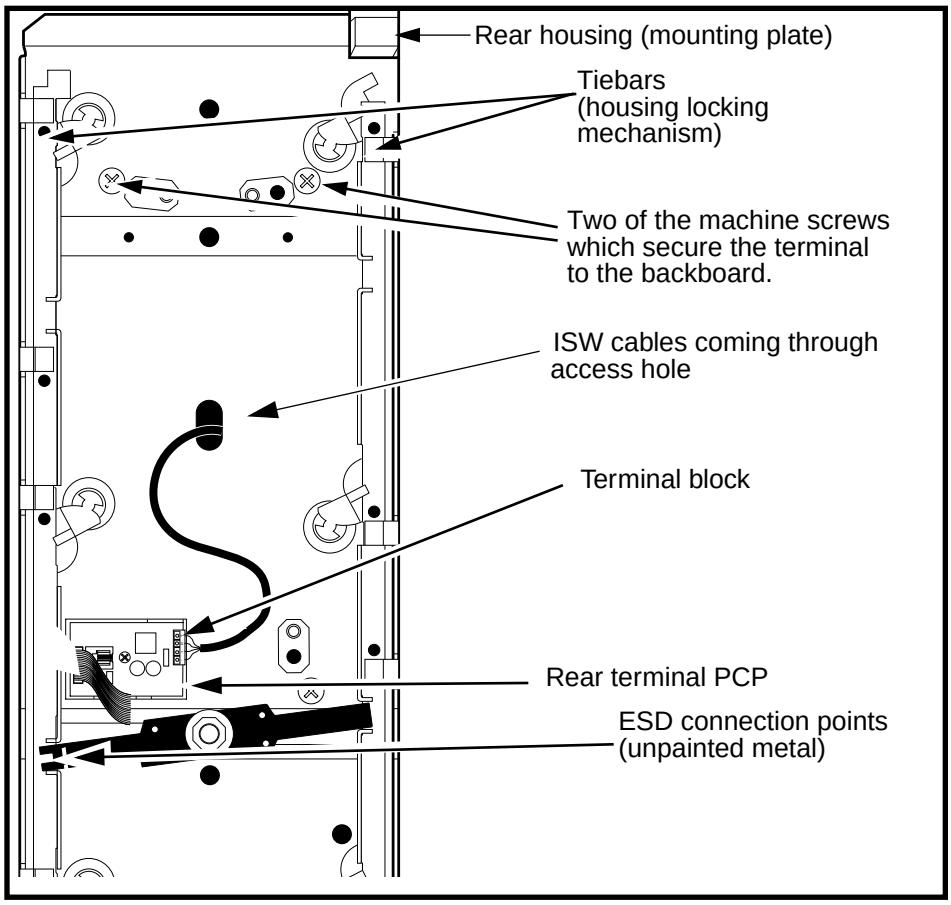
5. Attach your ESD strap to the connection point inside the terminal indicated in Figure 3-7.

6. Pull the ISWs through the oval wiring access hole in the mounting plate of the terminal.

7. Fasten the mounting plate to the backboard using two pan-head machine screws.
   These are 1/4-inch no. 20 screws, 1/2-inch long.
   Refer to Figure 3-7 to locate positioning.

8. Install remaining fasteners until the terminal is secure.

**Figure 3-7: Identifying rear housing parts, including ESD points**



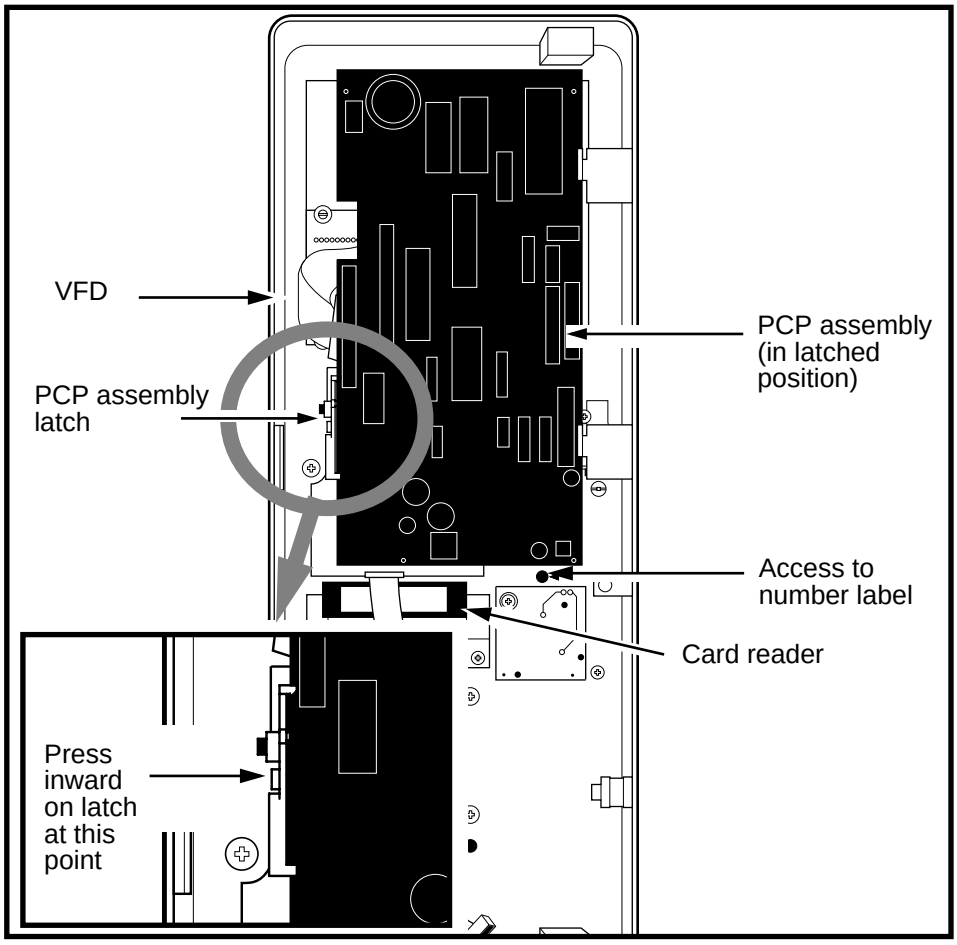
# C. Installing internal components

If you need to install an internal instruction card or quick access key labels, you must first remove the PCP assembly from the front housing assembly.

It is best to do this before you connect the outside lines to the terminal to ensure there are no power problems when you disconnect the PCP assembly boards.

Figure 3-8 shows the inside of the front housing with the PCP assembly in the latched position.

**Figure 3-8: Front housing, PCP assembly attached**



## Removing the PCP assembly

The PCP assembly contains the telephony and control PCPs in a plastic frame. To remove this assembly, follow these steps:

1. Attach your ESD wrist strap to the ESD connection point inside of the terminal, as indicated in Figure 3-7.

2. Ensure the ISWs are not connected to the terminal block on the rear terminal PCP, or that the terminal block is disconnected from the rear terminal PCP.

   This ensures power is disconnected from the control PCP.

3. Disconnect the cables from their connectors on the control PCP.
   The control PCP connector numbers are given in Table 3-2.

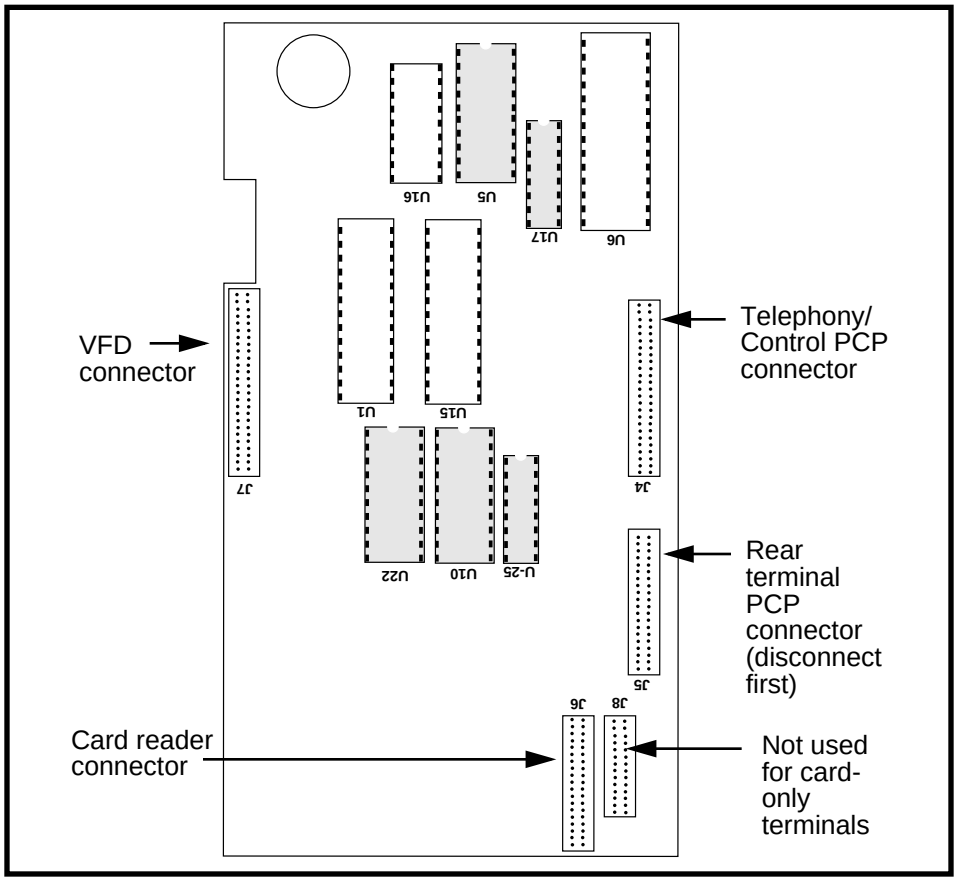
**Table 3-1: Control PCP connections**

| Component cable | Detach from this connector |
|---|---|
| **Disconnect first.**<br>**Reconnect last.**<br>J18, rear terminal PCP | J5 on the control PCP |
| J19, card reader PCP | J6 on the control PCP |
| J20, display PCP | J7 on the control PCP |
| **If the terminal has a smart card alert** | |
| J14 alerter cable | J37 on the smart card alert daughter board |
| J38 interconnect cable<br>(either from J52 on keypad PCP or on * external hookswitch module) | J36 on the smart card alert daughter board |
| * A modified keypad/hookswitch combination was released in August 1997. On this component, the keypad connects to the hookswitch with a mylar cable. In this configuration, the alerter interconnect cable connects to the hookswitch as well. | |

***Note:*** If you are unsure of the cable connections, look for the name and number of the connection printed on the PCP.

The connector positions on the control PCP are indicated in Figure 3-9.

**Figure 3-9: Control PCP connectors**



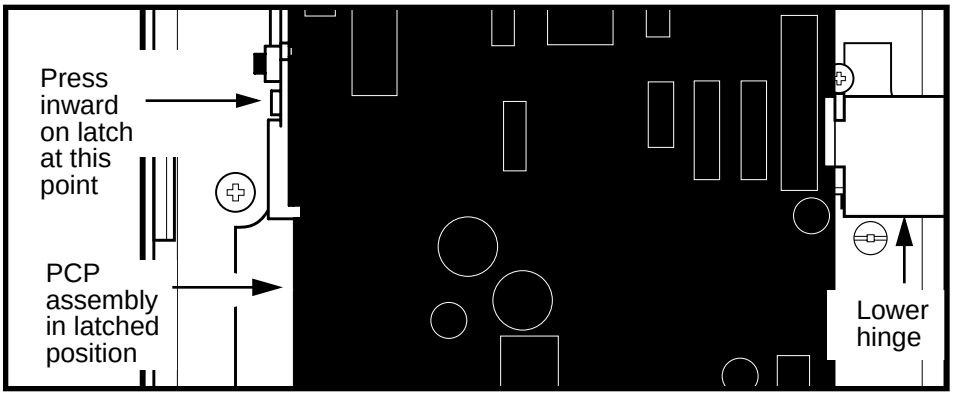

4. Release the PCP assembly.

   The latch is on the left side of the PCP assembly as you face the inside of the opened housing assembly, as shown in Figure 3-8.

5. Press along the centre arm of the latch to disengage it from the housing assembly. Refer to Figure 3-10

This allows the PCP assembly to swing out.

**Figure 3-10: Locating the PCP assembly latch**




6. Grasp the assembly by the plastic frame and swing it outwards. It sits at an angle to the housing, exposing the inside cables.

7. Disconnect the cables from their connectors on the telephony PCPs.
   The telephony PCP connector numbers are given in Table 3-2.

**Table 3-2: Telephony PCP connections**

| **Component cable** | **Detach from this connector** |
|---|---|
| J15, handset | J10B on the telephony PCP |
| J53, keypad PCP<br>* J53, external interface hookswitch module | J1A on the telephony PCP |
| **If the terminal has the datajack feature installed:** | |
| datajack cable | J34 on the telephony PCP. |
| * A modified keypad/hookswitch combination was released in August 1997. On this component, the keypad connects to the hookswitch with a mylar cable and the hookswitch connects to the telephony PCP. | |

***Note:*** The name and number of the connections are also printed directly on the boards.

8. Grasp the PCP assembly frame at the top and bottom. Touch only the plastic frame.

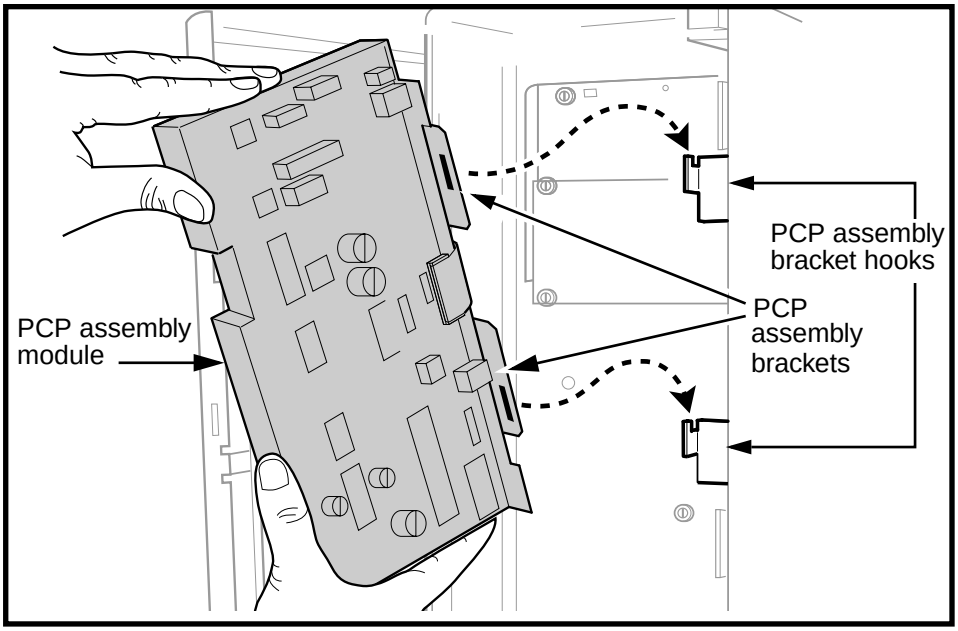
9. Hold the PCP assembly at an angle and slide it up enough to disengage it from the bracket hooks. Refer to Figure 3-11.

10. Move the PCP assembly out, off the bracket hooks.

    Refer to Figure 3-11.

    Store the PCP assembly in a safe location, in an anti-static bag.

**Figure 3-11: Removing the PCP assembly**




| **See this:** | Look on the rear housing for a label with the serial number of the terminal. Record the number in a convenient place to use for the software INSTALL routine. |
|---|---|

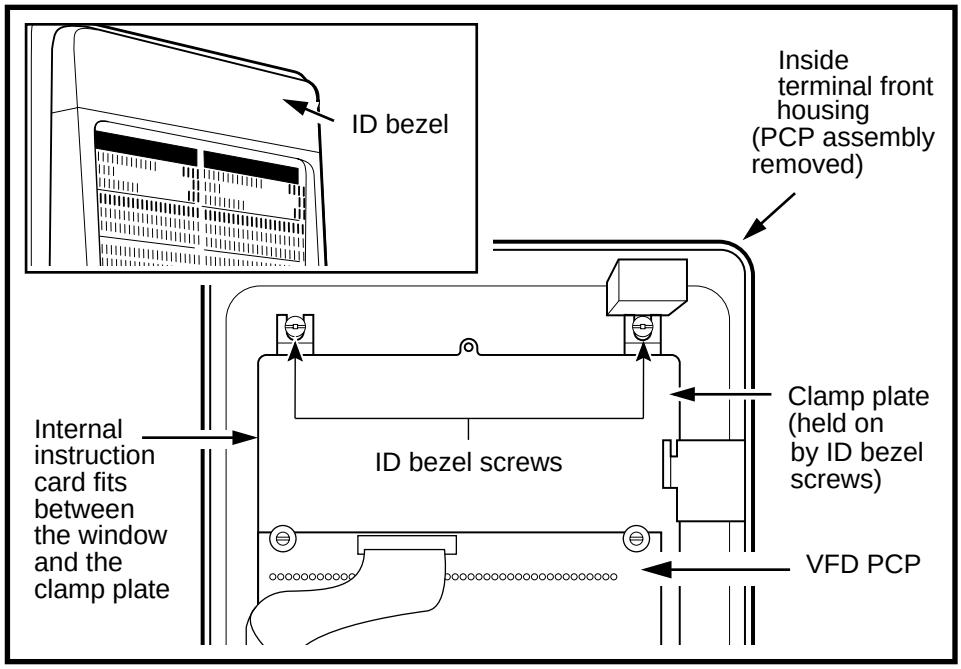
## Installing an internal instruction card

If the operating company uses internal instruction cards, you must remove the clamp plate to fit the card behind the display window.

To install an internal card, follow these steps:

1. The PCP assembly is removed.
2. Use one hand to support the ID bezel on the exterior of the terminal.
3. Remove the two screws inside the housing assembly securing the ID bezel, which are shown in Figure 3-12.

**Figure 3-12: Releasing the clamp plate and ID bezel**




4. Remove the ID bezel by lifting it away from the front of the terminal.
5. Remove or lift the top of the clamp plate.

6. Fit the instruction card against the display window below the clamp plate with the instructions facing the exterior of the terminal.

7. Align the notch in the lower edge of the card and the hole in the tab at the top of the card over the corresponding pins on the upper bezel.

| **See this** | **Inmate terminal** |
|---|---|
|  <br>**Inmate instruction plate installation** | This terminal has a metal plate with silkscreen instructions instead of a window assembly.<br><br>To install the instruction plate:<br><br>1. Ensure the gasket around the window opening in the housing is set.<br><br>2. Fit the plate against the gasket as you would the internal instruction card, with the instructions facing away, to the outside of the terminal.<br><br>3. Continue with **step 9**. |

8. Reinstall the clamp plate, keeping the bend in the cable for the VFD connector.

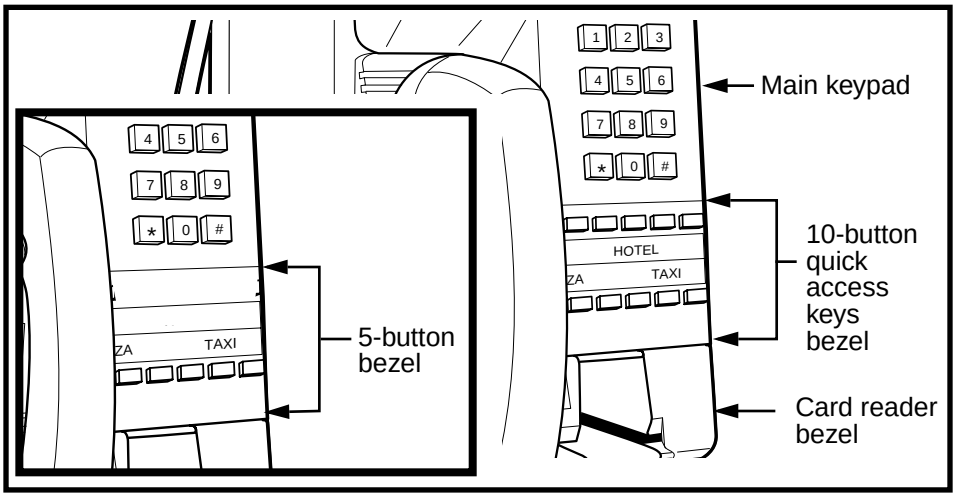
9. Replace the ID bezel and reattach the two screws from inside the housing assembly to secure the ID bezel and clamp plate.

## Installing the quick access keys label

If the terminal you are installing has quick access keys, ensure that there is a label installed.

Figure 3-13 shows the two types of quick access key bezels. ***Note:*** A blank bezel is also available.

**Figure 3-13: Quick access keys bezels**




The following steps describe how to install the **quick access keys label**:

1. Push in on the round rubber stud located between the two screws securing the quick access keys.
   Refer to Figure 3-14 to locate the stud.

   This will bend the window outward on the front of the terminal until the center of the window is high enough to grasp.

   ***Note:*** Some terminals will not have this access because of a new version of the upper bezel assembly. In that case, you must pry the window out from the exterior of the terminal.

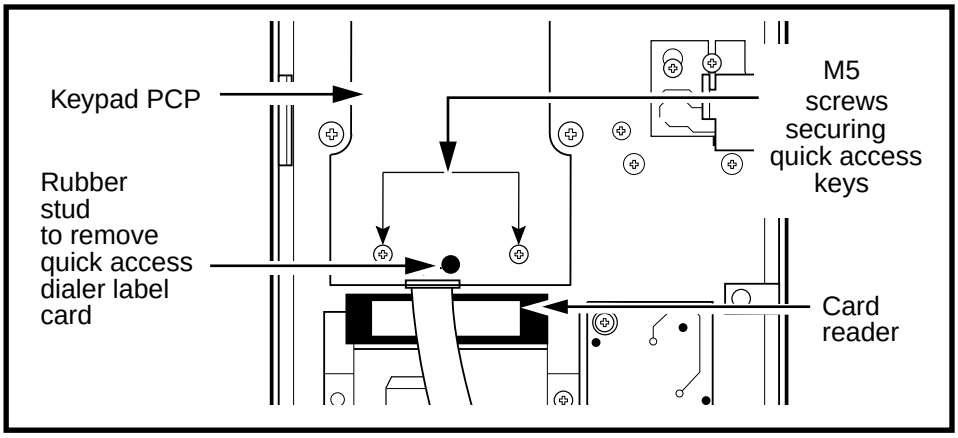
2. Pull the window out.

3. Insert the quick access keys label behind the window.

4. Insert one end of the window in position in the space on the bezel.

5. Bend the window outward and insert the opposite end into position, then release it.

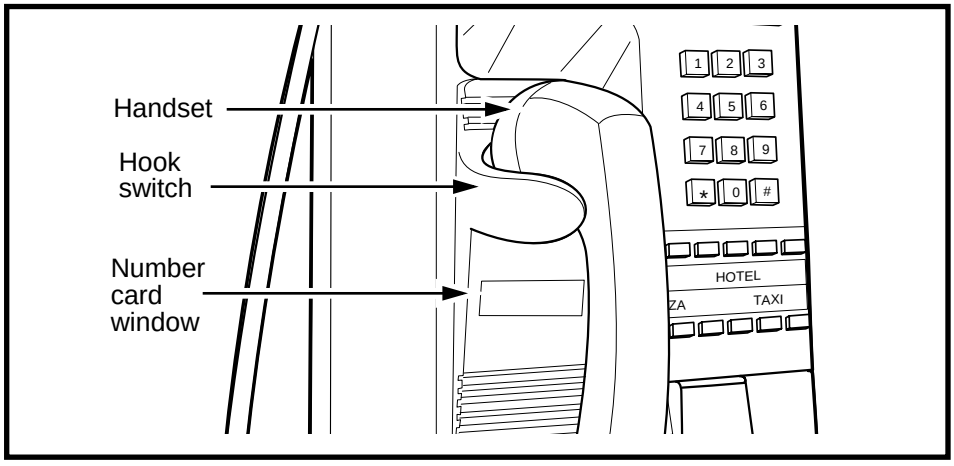
**Figure 3-14: Screws securing the quick access keys**




## Installing the number card

The number card, which identifies the terminal phone, number is located under the handset.

**Figure 3-15: Locating the number card beneath the handset**

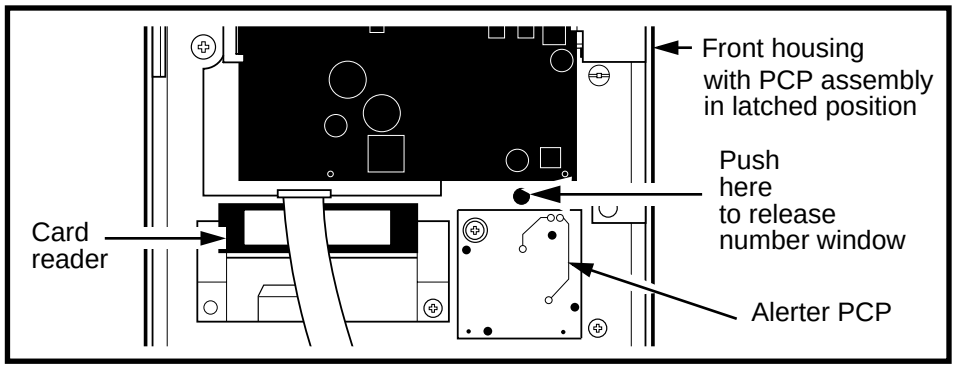


To install or replace the **number card**, follow these steps:

1. Press on the window from the inside of the terminal through the hole indicated in Figure 3-16.

   Use a screwdriver of 8 mm or less, or a similar instrument.
2. Push until the window is free of the alerter bezel.
3. Insert the number card behind the window.
4. Replace the number card window.
5. Insert one end of the window into the opening in the alerter bezel.
6. Bow the window outward
7. Insert the opposite end into position, then release the window.

**Figure 3-16: Accessing the number card**




| See this | Mattock fender |
|---|---|
| **Inmate terminals** | Inmate terminals come with a metal plate that fits between the housing and the alerter module. This piece, called the Mattock fender, blocks the hole used to access the number card window.<br>In this case, use a penknife to pry the number card window off on the outside of the terminal. |

# D. Re-installing the PCP assembly

Once you have finished installing the internal components, you can replace the PCP assembly and reconnect the cables, as explained in the steps below:

1. Replace the PCP assembly by reversing the steps in **Installing internal components** on Page 3-10.

   ***Note:*** Ensure the terminal block is disconnected from the rear terminal PCP, or the ISWs are disconnected from the terminal block if you cannot remove the terminal block from the rear terminal PCP.

2. Reconnect all the cables to the PCP assembly.

   - Ensure that the cables are fully seated in their connectors
   - Fold excess cable and tuck it away from the edges of the terminal.
   - Swing the assembly on its hinges into the terminal and ensure it is securely latched in place.

| **See this** | **Inmate terminal** |
|---|---|
|  <br>***Note:*** This is the only situation when the display can be installed without first entering your access code and PIN number and unlocking the terminal. | If you will be doing the software INSTALL immediately, install the portable display:<br>1. With the power off, connect the portable display cable to the VFD cable connector on the control PCP.<br>2. Position the display on top of the front housing. The display has a magnet on the bottom.<br>3. Continue with **Connecting the outside line** on Page 3-21.<br>**Refer to Chapter 4 for detailed installation instructions** |

# E. Connecting the outside line

Once the terminal is secured on the wall and the PCP assembly has been replaced and the cables reconnected, the terminal is ready to be connected to the CO line.

Since you are working with electrical components, take the proper safety precautions.

| **ESD precautions**  | To prevent damage to the electrostatic-sensitive devices in the terminal, wear your ESD wrist strap. Connect it to the ESD connection points shown in Figure 3-7. |
|---|---|

The following procedure describes the process of **attaching the ISWs** to the terminal block.

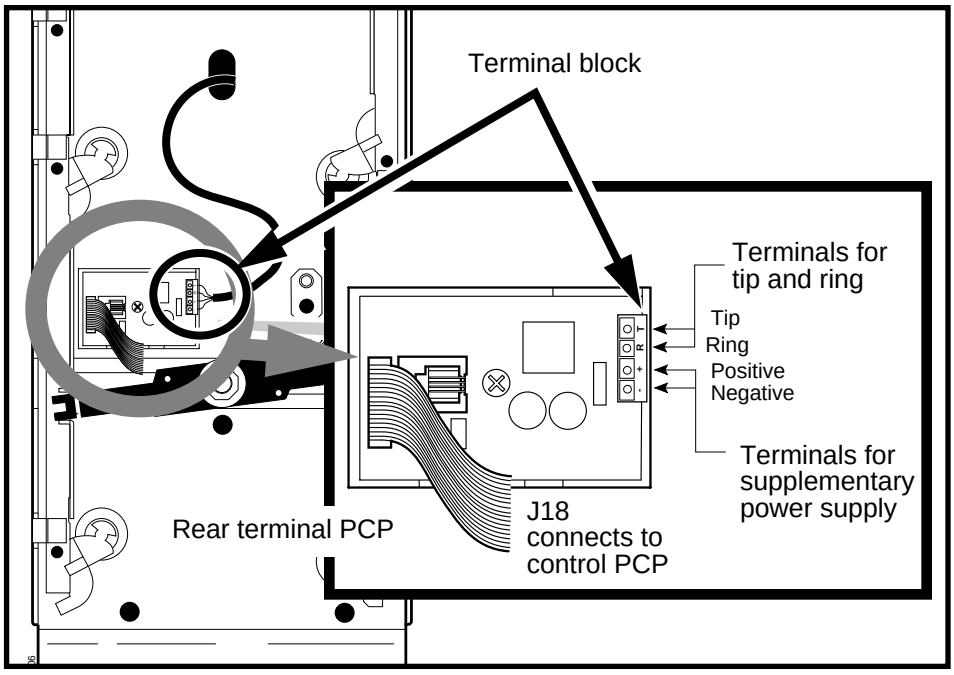
1. Disconnect the rear terminal PCP (J18) cable from the control PCP connector (J5).
   This ensures power is not connected to the control PCP for the duration of this procedure.

2. Remove the tape insulating the bare ends of the ISWs and strip the end of each wire.
3. Connect the wires to the terminal block on the rear terminal PCP. Refer to Figure 3-17.

   Use a small screwdriver to connect the leads as shown in Figure 3-17. There are four terminals — tip and ring for the CO connections, and positive and negative for the supplementary power supply.

   If the terminal has an IAS module, the wires connect to the terminal block on this module. Follow the directions in **Connecting power to an IAS module** on Page 3-23.

**Figure 3-17: Connecting wires to the terminal block**




| **CAUTION** | Ensure the proper polarity when connecting the supplementary power supply.<br><br>**When working with ISWs:**<br>• Take the usual precautions with the wiring if current is on during installation.<br>• Conceal the wiring near the telephone or use approved moulding or tubing.<br>• Locate protectors and connecting blocks so they are inaccessible to the public. |
|---|---|

## Connecting power to an IAS module

If the terminal has an IAS module, you connect the power to the terminal block on that module instead of to the terminal block on the rear terminal PCP, as described in the previous section.

An interconnect cable from the connects the IAS module to the rear terminal PCP

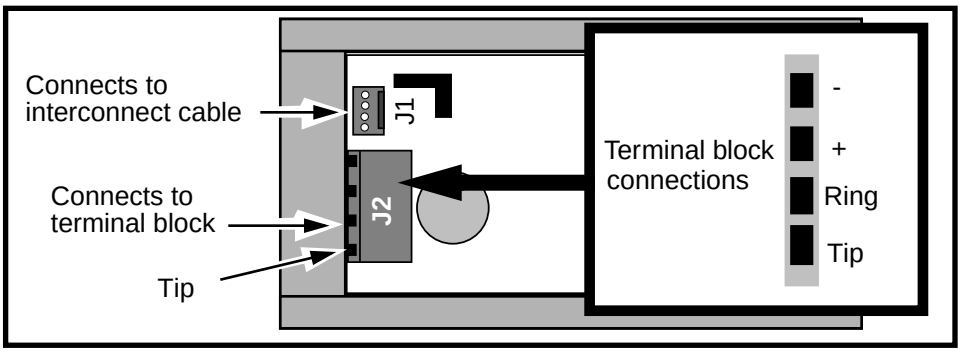
**The following procedure describes how to connect the ISWs to the terminal block on the IAS module.**

1. Pull the ISWs through the wiring access hole so they reach the IAS module.
2. Remove the terminal block from the IAS module (J2).
3. Screw the wires into the IAS terminal block in the same order as they would attach to the terminal block on the rear terminal PCP.

   Refer to the inset in Figure 3-18 for the correct configuration.

| **CAUTION** | • Ensure that the ISWs do not touch the internal boards.<br>• Ensure the proper polarity when connecting the power supply. |
|---|---|

**Figure 3-18: IAS module terminal block connections**



4. **Do not connect the terminal block to the IAS module until you are instructed to restore power** to the terminal, later in this chapter.

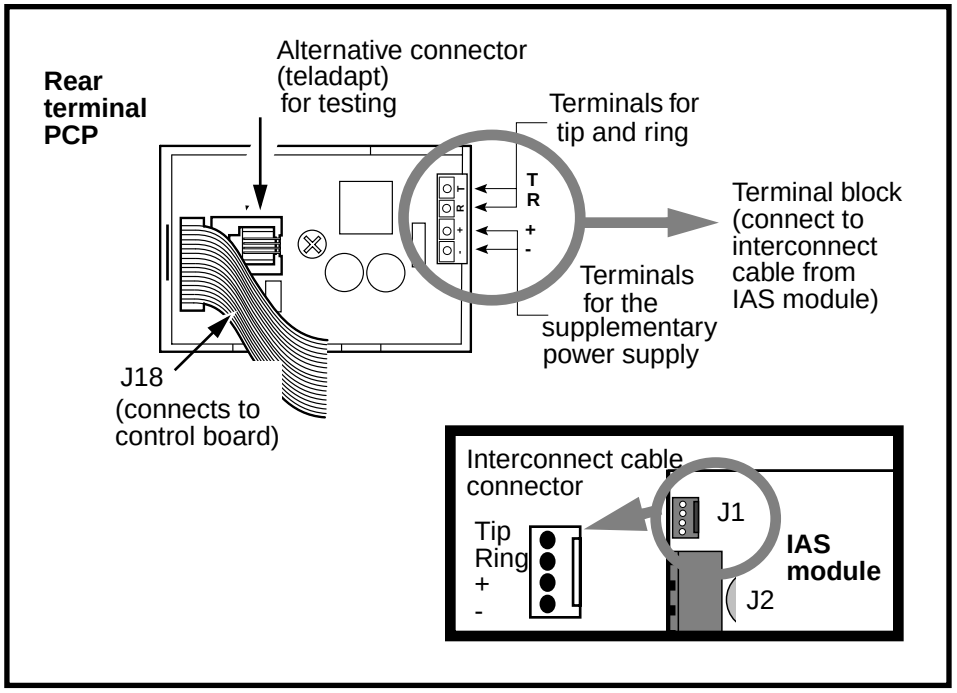
5. Connect the IAS module interconnect cable to the rear terminal PCP terminal block:

   a) Attach the connector on the interconnect cable to J1 on the IAS module. Refer to Figure 3-19.

   b) Strip the ends of the wires from the free end of the interconnect cable.

   c) Secure the stripped wires into the terminal block on the rear terminal PCP (J28) in the same order they are connected to the IAS module. Refer to Figure 3-19.

**Figure 3-19: Wire positions on the terminal block**



# F. Completing the installation

To complete the physical installation of the terminal, follow these steps:

1. Connect the power to the terminal.

   If the ISWs have been connected to the terminal block on the rear terminal PCP, connect the rear terminal PCP cable (J18) to the control PCP connector (J5).

   **IAS module:** If the terminal has an IAS module, connect the terminal block containing the ISWs to that module.

| **See this**  | If **`Telephony board not responding`** appears on the display, with the terminal open and the handset on-hook, allow the terminal to power-up for three minutes.<br>During this time, the terminal will not respond to further install or maintenance instructions.<br>After this warm-up period, the following prompt will appear:<br>`Enter PIN: ■■■■■`<br>`◆=Fix,✳=Save, #=STOP` |
|---|---|
| **Error:** | If **`Telephony board not responding`** does not go away after the warm up period, the telephony PCP is defective.<br>Replace it and try again. |

2. Once the PIN prompt appears, do one of the following:

   - If you are not going to do the INSTALL at this time, press #, and continue with **step 3**.
   - If you are ready to do the INSTALL routine, enter your PIN and proceed with the INSTALL routine.

The INSTALL routine is explained in Chapter 2 in *Millennium terminals: using the craft interface*.

When the routine is finished, go to **Step 4**.

| See this | |
|---|---|
|  | ***Note:*** You must close and lock the set to end the INSTALL routine or it will not take effect. |

3. Remove your ESD wrist strap and close the terminal.

4. Lock the terminal with the T-tool and the key and place the handset on-hook.

| See this | |
|---|---|
|  | **Inmate terminal**<br>Since you cannot completely close this terminal, you must **simulate locking the terminal** by moving the side housing tiebar up.<br>Do this when you reach this step. |

   a) **If you did not run the INSTALL routine:** After ten seconds **`Out of service`** appears on the display.
   If **`Telephony board not responding`** displays after ten seconds, replace the telephony PCP.

   b) **If you ran the INSTALL routine:** The initial user prompt displays on the VFD.

5. Perform function tests to ensure the terminal is working properly.

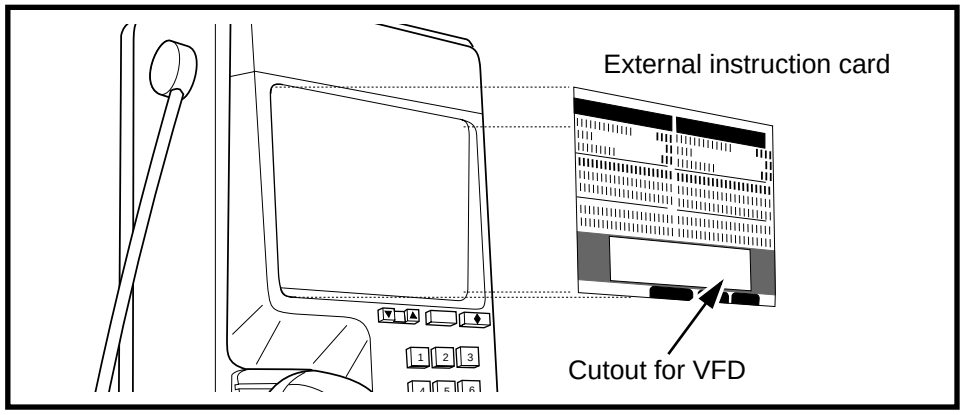
| See this | |
|---|---|
|  | **Inmate terminal**<br>You must now remove the portable VFD.<br>For a detailed procedure, refer to **Removing the portable display** on Page 4-9. |

## Installing external instruction card

If the operating company uses external instruction cards, refer to Figure 3-20 and proceed as follows:

1. Bend the external instruction card, and insert its corners under the lip between the display window and upper bezel.
2. Slide your fingers along the edges of the card, pressing the edges under the lip until it snaps into place.
3. Position the card so all its edges are covered.

**Figure 3-20: Inserting the external instruction card**



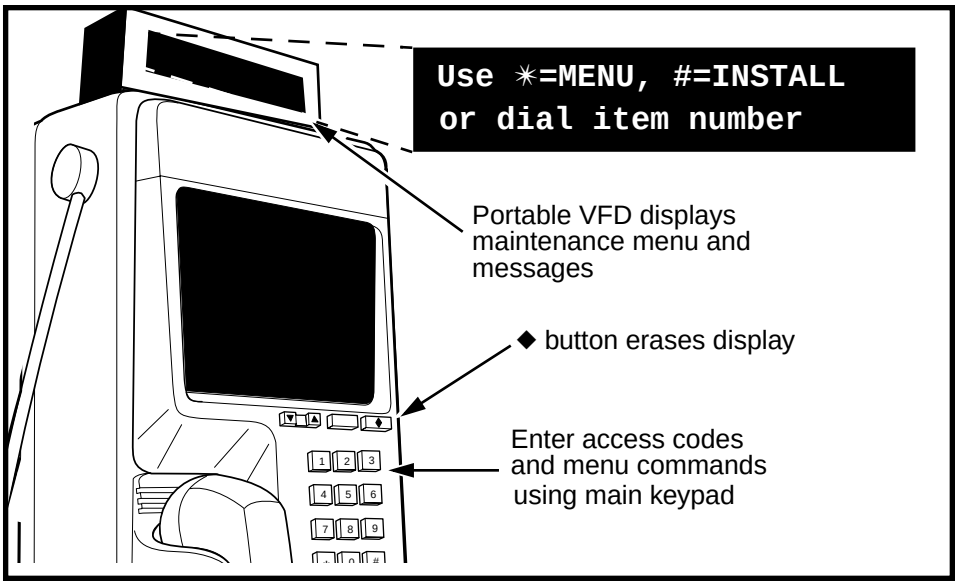
# 4 Installing a portable display

The Inmate terminal is a Card-based terminal without an internal display. In order to view the craft interface prompts to install and maintain the terminal, a portable display is connected to the VFD connector inside the terminal.

This display is contained in a solid housing which sits on top of the front housing during the INSTALL or maintenance procedures.

Figure 4-1 shows an Inmate terminal connected to an external display.

**Figure 4-1: Portable VFD on Inmate terminal**



Since the terminal cannot be closed fully when this display is used, the housing tiebars must be manipulated during the locking/unlocking sequences of the procedure.

# Before you install the display

Chapter 2 describes how you connect the portable display to a terminal which has just been installed on-site and has not had the power connected or a software INSTALL procedure done.

AT ALL OTHER TIMES, before you install the display you must:

- enter your craft interface access code and PIN
- unlock the terminal
- disconnect the power from the rear terminal PCP

Otherwise, you will trigger an alarm at the Millennium Manager that the terminal is being illegally accessed.

The following sections give specific procedures for these steps.

## Entering the craft interface

You must notify the terminal and the MIllennium Manager that you are going to unlock and open the terminal.

| **See this**  | If you try opening and unlocking the terminal without going through these steps, the terminal will send an alarm message to the Millennium Manager.<br><br>You will not be able to continue with the process until you close and lock the terminal again. |
|---|---|

Follow these steps to access the terminal before you install the portable display or if you need to enter the craft interface to perform the INSTALL or maintenance procedures:

1. While the handset is on-hook, enter the access code from your instruction card.

   If the terminal needs to have the INSTALL procedure run because it has never been installed, enter the default access code. This situation will occur when you have replaced a control PCP.

2. Enter your personal identification number (PIN) code

   If you make a mistake, press the ◆ button, then re-enter the number.

3. Press ✳.

| **See this**  | It is important to unlock and open the terminal quickly after pressing ✳.<br>If you do not open the terminal within three minutes, the terminal times out. At that point, you must repeat **steps 1 to 3**.<br>If you attempt to open the terminal after it has timed out, the terminal will send an alarm to the Millennium Manager and you will need to close and lock the terminal and re-access it before you can continue. |
|---|---|

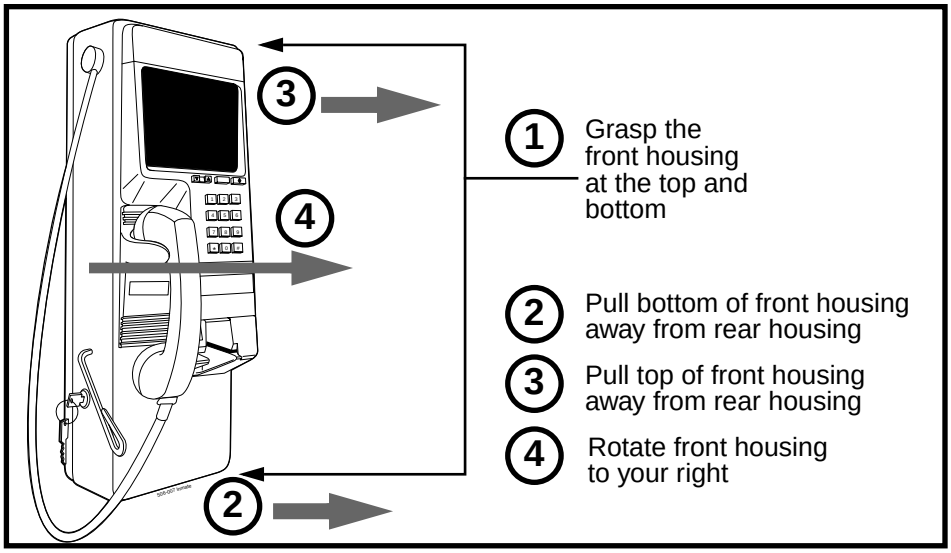
4. Unlock the housing with the key.
5. Release the housing locking mechanism with the T-tool.

# Opening the Inmate terminal

This section list specific steps for opening the housing of any Card-based terminal.

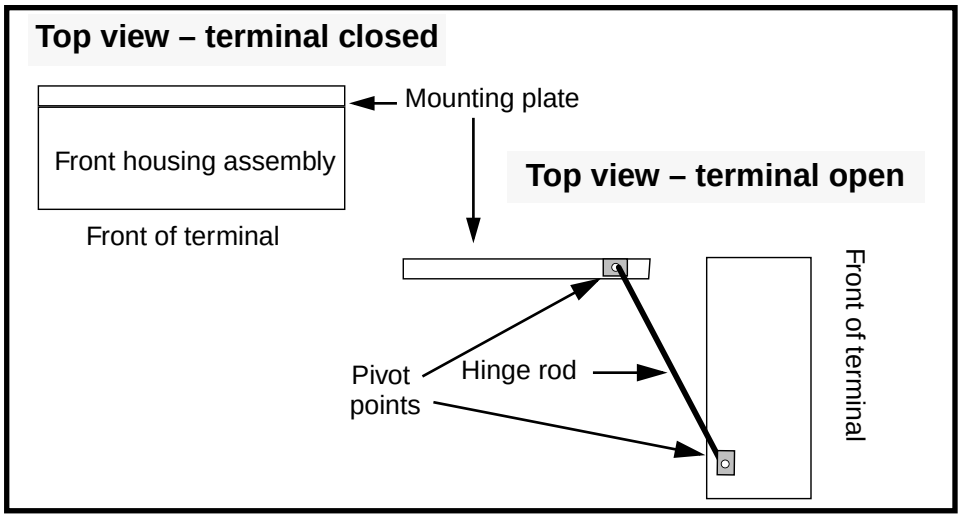
1. Grasp the housing firmly by the top and bottom of the front housing.
2. Pull the bottom of the front housing away from the back housing.
3. Pull the top of the front housing away from the back housing.

**Figure 4-2: Proper sequence to open the housing**




4. Swing the front housing towards your right, rotated as shown in Figure 4-3.
5. Check that the hinges are still connected inside the terminal.

**Figure 4-3: Opening the terminal, overhead view**




## Installing the external portable display

The following procedure assumes you have correctly opened the terminal housing, as described above, and are ready to install the portable display.

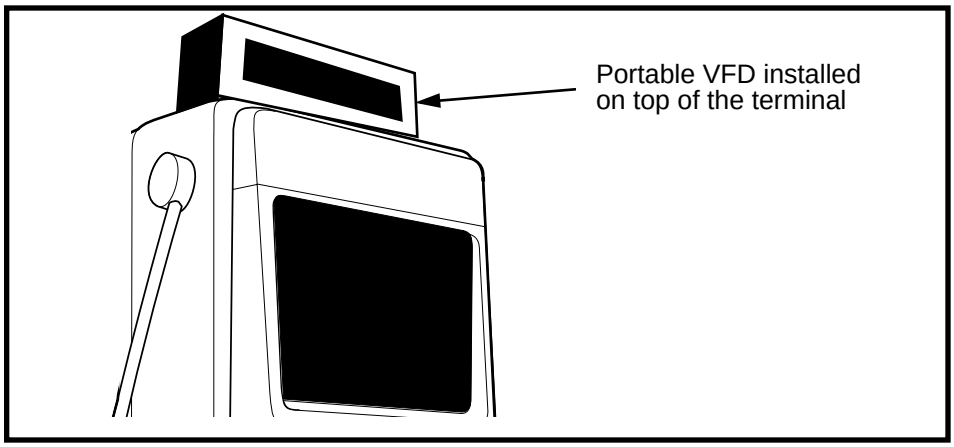
1. Connect your ESD strap to an ESD connection point inside the terminal.

| **ESD precautions** | • To prevent damage to the electrostatic-sensitive devices inside the terminal, wear your ESD wrist strap.<br>• Attach your ESD strap to either the left or right strike plates inside of the rear housing assembly or to the key in the keylock.<br><br>**Failure to follow these precautions may damage electrostatic-sensitive devices.** |
|---|---|

2. Disconnect the rear terminal PCP cable connector (J18) from the connector on the control PCP (J5) to remove power from the control PCP.

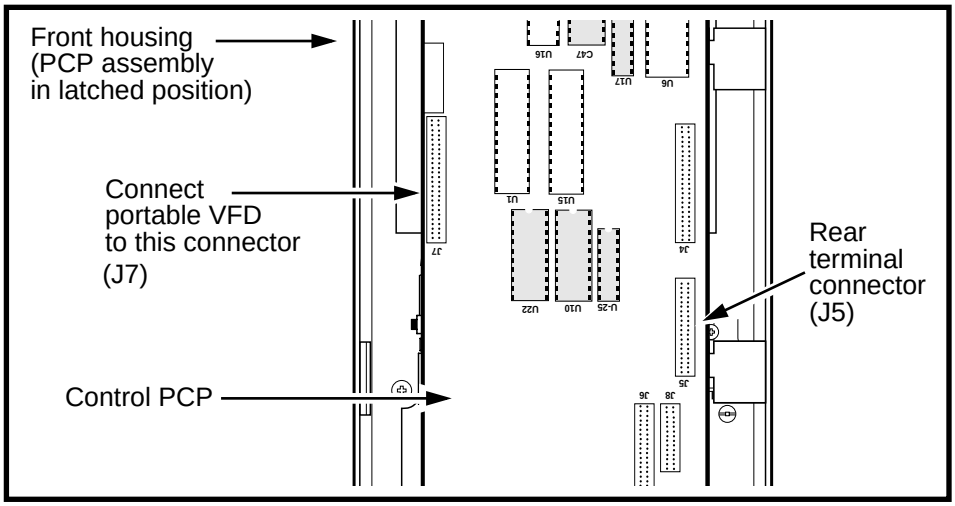
3. Place the portable VFD unit on the top of the front housing of the terminal, as shown in Figure 4-4. The unit has a magnet on the bottom.

**Figure 4-4: Installing the external portable VFD**




4. Attach the VFD cable to the VFD connector (J7) as shown in Figure 4-5.

**Figure 4-5: Connecting the VFD to the control PCP**



5. Reconnect the rear terminal PCP cable connector (J18) to the connector on the control PCP (J5) to restore power from the control PCP.

6. Partially close the housing so you have access to the keypad and can see the display clearly.
   Do not close it far enough to pinch the VFD ribbon cable.

7. Continue with the INSTALL.

   If the terminal has timed out and the portable VFD is blank, refer to the **Re-entering the craft interface**, below.

| **See this**  | To exit from the maintenance routine at any time, move up the left side tiebar up to simulate locking the terminal. |
|---|---|

## Re-entering the craft interface

If the craft interface timed out while you were attaching the external portable VFD, you need to simulate locking the terminal and return to the beginning of the craft interface process.

This process is described below:

1. Open the housing and **pull up** the vertical locking tiebar on the left side of the rear housing, to simulate locking the terminal. Refer to Figure 4-6.

2. Close the terminal enough to access the keypad.

3. Enter the access code on your instruction card.

4. Enter your personal identification number (PIN) code.

5. Press ✳.

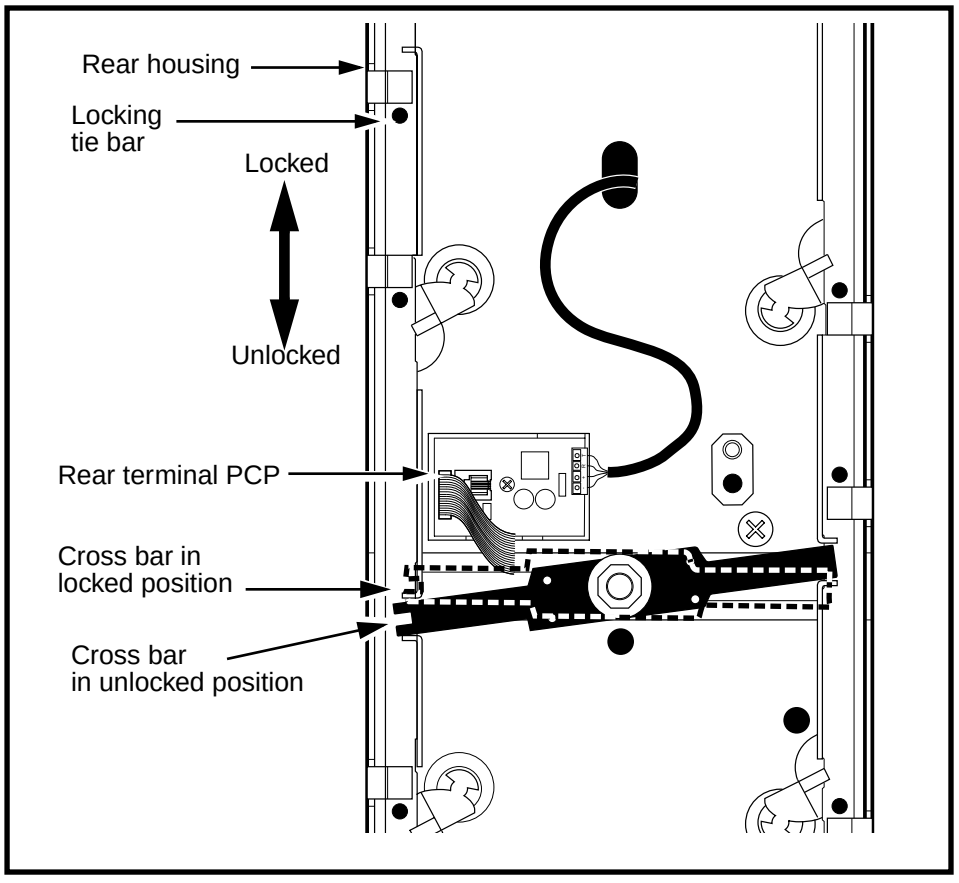
This message appears on the VFD:

```
Please use key now
& open the terminal
```

6. Open the terminal housing again and **slide down** the vertical locking tiebar, to simulate opening the terminal.

7. Continue with the INSTALL routine.

**Figure 4-6: Locking/unlocking with the tiebar**



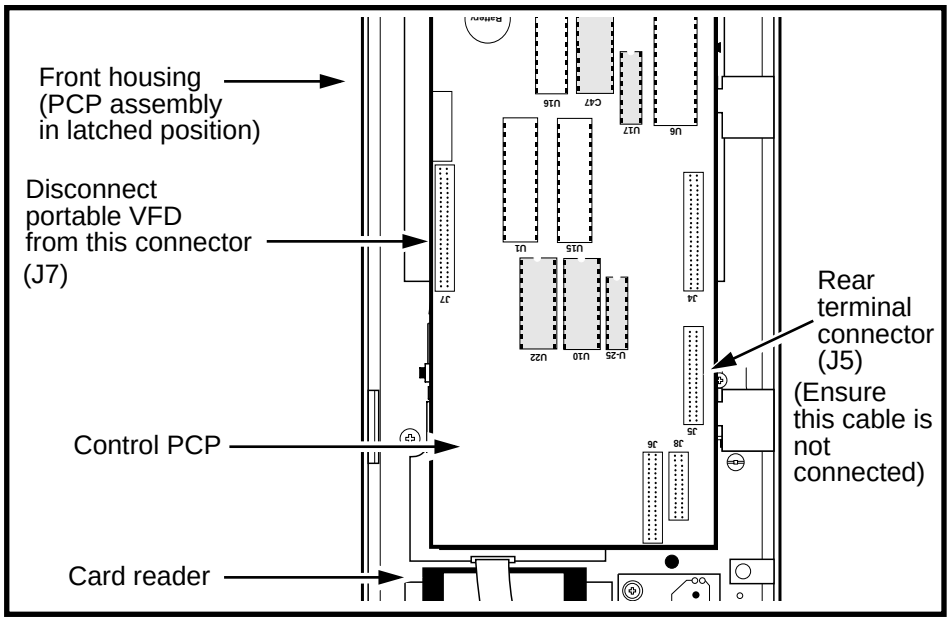
# Removing the portable display

The following procedure describes how to correctly remove the portable display, including ensuring that the craft interface is properly exited.

Do this procedure when you have finished working with the craft interface and no longer need visual prompts.

1. Open the housing so you have access to the control PCP.
2. Connect your ESD wrist strap ground inside the terminal, if you have not already done so.
3. **Move up** the left vertical locking tiebar on the rear housing to simulate locking the terminal.
   This ensures the INSTALL procedure is complete.
4. Enter your access code and PIN and press ✳
5. At the unlock prompt, **move down** the vertical tiebar to simulate unlocking the terminal.
6. Disconnect the rear terminal PCP cable (J18) from the connector on the control PCP (J5) to disconnect the power from the control PCP. Refer to Figure 4-7.
7. Disconnect the portable VFD cable from J7 on the control PCP and remove it from the terminal. Refer to Figure 4-7.
8. Reconnect the rear terminal PCP cable (J18) to the connector on the control PCP (J5) to reconnect the power to the control PCP. Refer to Figure 4-7.

**Figure 4-7: Disconnecting the VFD cable**




9. Refer to Figure 4-8 and follow these steps to close the terminal housing:

   a) Ensure that:

      - the left vertical tiebar is down — the terminal is in an unlocked state
      - the hinges are in place
      - all the cables are tucked away from the edges of the housing

   b) Disconnect your ESD strap from inside the terminal.

   c) Grasp the front housing at the top and bottom and turn it so the front of the housing faces you directly.

   d) Lift the housing and position it squarely over the rear housing.

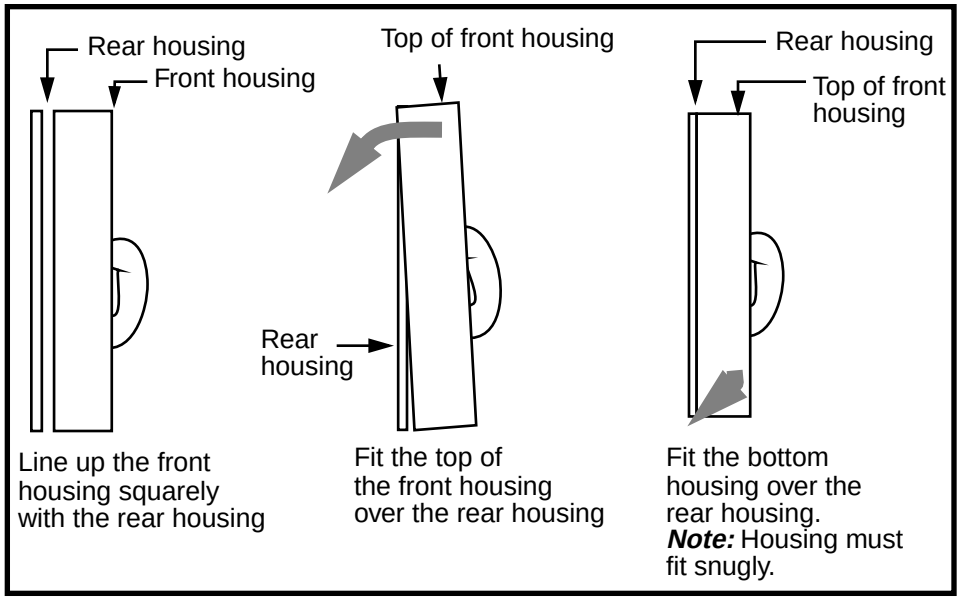
   e) Fit the top of the housing squarely onto the rear housing.

f) Fit the bottom of the housing squarely onto the rear housing.

The front housing should fit snugly against the edge of the back housing. If this is not the case, remove the housing and try again from **step 9**.

| **CAUTION** | Failure to close the terminal housing properly may result in illegal entry to the terminal. |
|---|---|

**Figure 4-8: Closing the housing**




10. Lock the payphone by turning the T- or L-tool clockwise to secure the housing.
    Turn the key counterclockwise until it stops.

11. Test all the functions of the terminal.

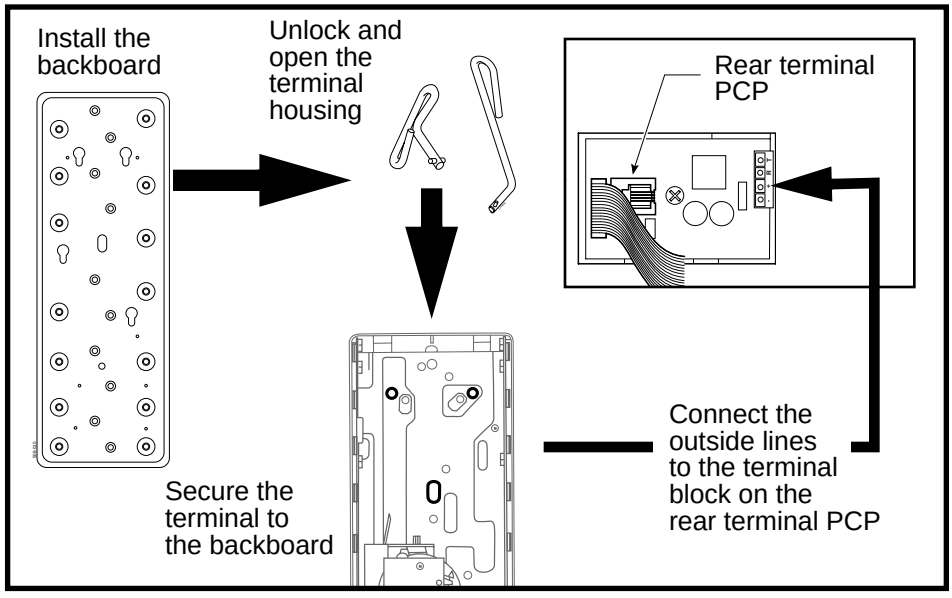
# 5 Installation flowcharts

This chapter provides quick-view flowchart showing the installation procedures for a standard **Card-based terminal**.

***Note:*** These flow charts highlight the key points to the procedure. For detailed explanations, refer to **Chapter 3**. For detailed information for installing an Inmate terminal portable display, refer to **Chapter 4**.

Figure 5-1 gives a overview of the hardware installation process.

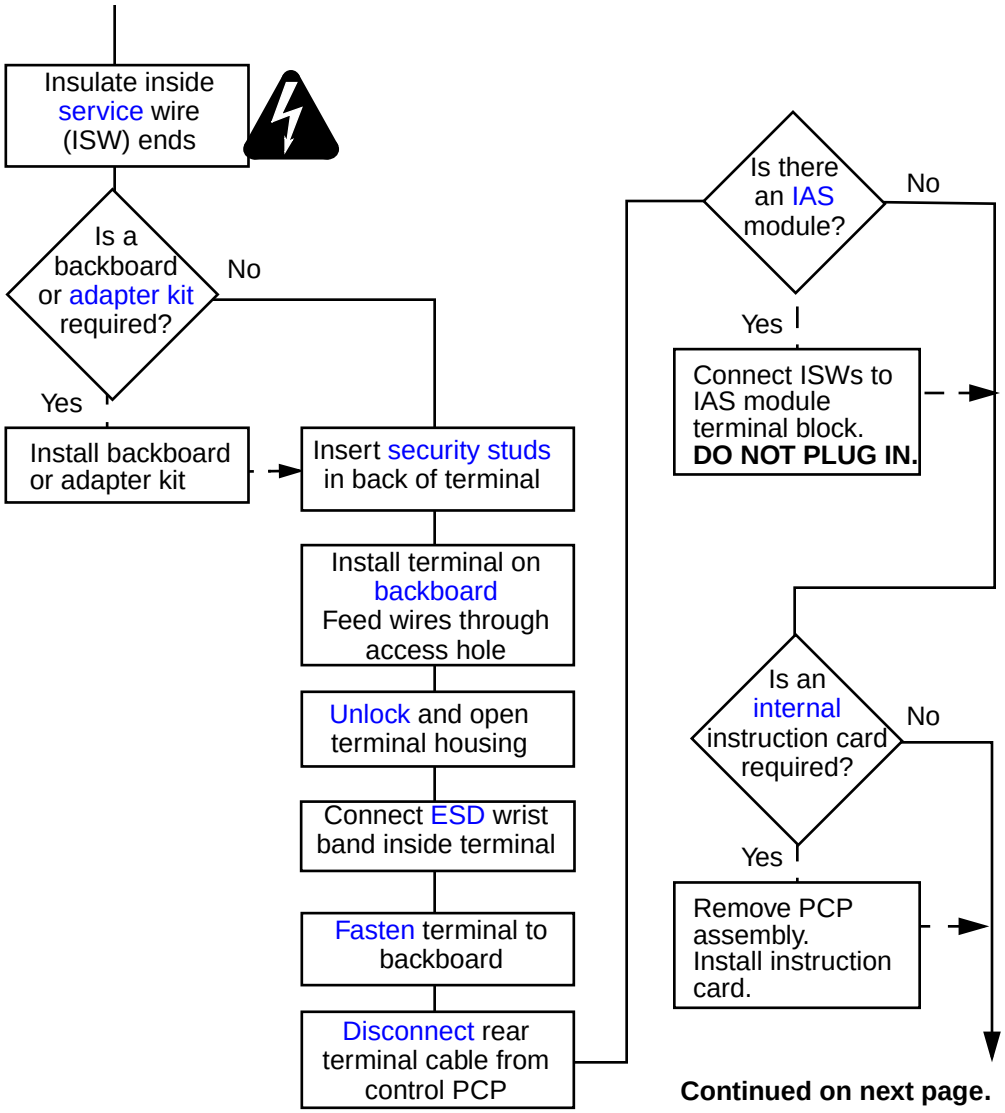
**Figure 5-1: Terminal installation overview**



# Card terminal installation flowchart

If you are familiar with Millennium Card-based terminals, use the flow chart given below and on the next page as a guide to a typical installation.

**At the terminal site (CO line(s) are installed at site)**
**You have confirmed power and dialtone from the line**

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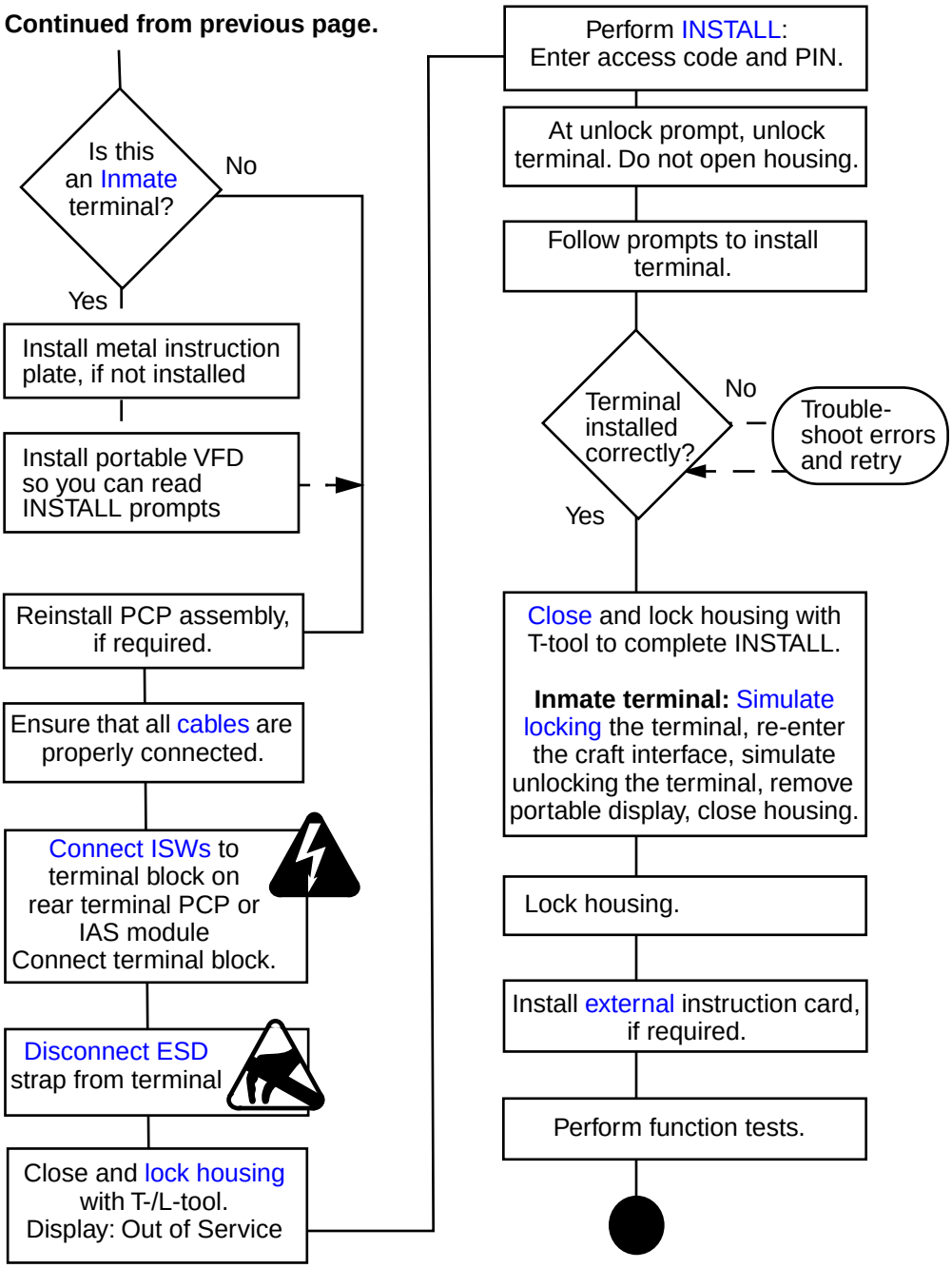

# Appendix A: Regulatory notes

This appendix includes various regulatory messages and safety instructions from the Canadian and American governments and from Underwriters Laboratories.

## Industry Canada notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The method of connection approved for this equipment as designated by D.O.C. Standard CS-03 is a CA11A/CA14A or CA11W/CA14W connection arrangement. The A or W suffix indicates that either desk or wall mounting is approved.

In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified jack-plug-cord ensemble (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Existing telecommunications company requirements do not permit their equipment to be connected to customer-provided jacks except where specified by individual telecommunications company tariffs.

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

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected.

**Caution:** Users should not attempt to make electrical ground connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

This telephone has been tested and found to comply with the limits for a Class A digital device in accordance with the specifications in CSA 108.8.

**Caution:** To eliminate the possibility of accidental damage to cords, plugs, jacks, and the telephone, do not use sharp instruments during the assembly procedures.

**Warning:** Do not insert the plug at the free end of the receiver cord directly into a wall or baseboard jack. Such misuse can result in unsafe sound levels.

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

This symbol on the product is used to identify the following important information:

Certified Class 2 Level C power source (24 VDC/500 mA max.).

## Shock hazard warning

To avoid potential electrical shock hazard to personnel or damage to the telephone, use only the manufacturer supplied equipment and installation procedures. The AC transformer must be CSA/UL or CSA-NRTL/C approved Class 2, level C.

### Address for warranty and repairs in Canada

Nortel
30 - Norelco Drive
Weston, Ontario
M9L 2X6

# U.S. regulations

This section consists of U.S. federal rules and cautions.

## Radio/TV interference

Terminals equipped with electronic push-key dials generate and use radio frequency energy, and if not installed and used properly and in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. These terminals have been tested and found to comply with the limits for a Class A digital device in accordance with the specifications in Part 15 of the FCC rules. While these rules are designed to provide reasonable protection, there is no guarantee that interference will not occur in a particular installation.

***Note:*** FCC registration does not constitute an expressed or implied guarantee of performance.

# Federal Communications Commission notice

***Note:*** This section mainly applies to the desk set.

**FCC registration number:** This telephone equipment complies with Part 68, Rules and Regulations, of the FCC for direct connection to the Public Switched Telephone Network. (The FCC registration number appears on a sticker affixed to the inside of the telephone.)

Your connection to the telephone line must comply with these FCC rules:

Use only an FCC standard RJ11W/RJ14W or RJ11C/RJ14C network interface jack and FCC-compliant line cord and plug to connect this telephone to the telephone line. (To connect the telephone, press the small plastic tab on the plug at the end of the telephone's line cord. Insert into a wall or baseboard jack until it clicks. To disconnect, press the tab and pull out.)

If a network interface jack is not already installed in your location, you can order one from your telephone company. Order RJ11W/RJ14W for wall-mounted telephones or RJ11C/RJ14C for desk/table use. In some states, customers are permitted to install their own jacks.

Your telephone may not be connected to a party line or coin telephone line. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

It is no longer necessary to notify the telephone company of your phone's registration and REN numbers. However, you must provide this information to the telephone company if it requests it.

If this terminal equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. If advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modification to maintain uninterrupted service.

Do not attempt to repair this equipment yourself. If trouble is experienced with this equipment, for repair or warranty information please contact 1-800-4NORTEL or write to Nortel, 640 Massman Drive, Nashville, TN 37210. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

**Signaling method:** The unit's push-key dial allows it to signal in tones (DTMF). It can complete calls to local and long distance lines and can also complete long distance calls via computer-phone systems such as MCI or SPRINT.

**Ringer Equivalence Number:** The FCC registration label (on the bottom of the phone), includes a Ringer Equivalence Number (REN), which is used to determine the number of devices you may connect to your phone line. A high total REN may prevent phones from ringing in response to an incoming call and may make placing calls difficult. In most areas, a total REN of 5 should permit normal phone operation. To determine the total REN allowed on your telephone line, consult your local telephone company.

**Hearing aids:** The telephone is compatible with hearing aids equipped with an appropriate telecoil option and is compliant with the requirements of the Americans with Disabilities Act (ADA).

# CSA/NRTL/UL installation instructions

**Warranty:** 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.

1. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
2. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
3. Use caution when installing or modifying telephone lines.

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

This symbol on the product is used to identify the following important information:

CLASS 2 power source (24 VDC/500 mA max).

# Important safety instructions

When using your telephone equipment, basic safety precautions should always be followed to reduce risk of fire, electric shock, and injury to persons. Follow these precautions:

1. Read and understand all instructions.
2. Follow the warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water, for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
5. Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
6. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
8. Do not overload wall outlets and extension cords as this can result in the risk of fire or electric shock.
9. Never spill liquid on any area of the product.
10. To reduce the risk of electric shock, do not disassemble this product, but have it sent to a qualified service person when some service or repair work is required.

11. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power supply cord or plug is damaged or frayed.
    - If the product has been exposed to rain or water, or if liquid has been spilled on the product, disconnect and allow the product to dry out to see if it still operates, but do not open up the product.
    - If the product housing has been damaged.
    - If the product exhibits a distinct change in performance.
12. Avoid using a telephone during an electrical storm. There may be a remote risk of electric shock from lightning.
13. Do not use the telephone to report a gas leak in the vicinity of the leak.
14. **Caution:** To eliminate the possibility of accidental damage to cords, plugs, jacks, and the telephone, do not use sharp instruments during the assembly procedures.
15. **Warning:** Do not insert the plug at the free end of the handset cord directly into a wall or baseboard jack. Such misuse can result in unsafe sound levels or possible damage to the handset.
16. Save these instructions.

## Shock hazard warning

To avoid potential electrical shock hazard to personnel or damage to the telephone, use only the manufacturer-supplied equipment and installation procedures. The DC transformer must be CSA/UL or CSA-NRTL/C approved Class 2 transformer.

# Appendix B: INSTALL routine quick reference

Table B-1 gives an overview of the INSTALL routine. For detailed information, refer to *Millennium terminals: using the craft interface*.

Also included in this chapter is a listing and description of the most typical errors which occur during the INSTALL routine. Refer to **Installation troubleshooting** on Page B-4.

**Table B-1: INSTALL quick reference**

| Step | Display | Action |
|---|---|---|
| 1. | *** out of service *** | With the handset is on-hook, enter the default access code. |
| 2. | **Enter PIN: ■■■■■**<br>**◆=Fix,✳=Save, #=STOP** | Enter five-digit personal identification number (PIN) code. |
| 3. | **Please use key now**<br>**& open the terminal** | Unlock and open the terminal |
| 4. | *Uninstalled terminal*<br>**Not installed**<br>**Use # to INSTALL**<br>*Installed terminal*<br>**Use ✳=MENU, #=INSTALL**<br>**or dial item number** | Press #. |

**Table B-1: INSTALL quick reference (continued)**

| Step | Display | Action |
|---|---|---|
| 5. | **CO line check**<br>**Go offhook** | Lift the handset off-hook. |
| | **Checking CO connection** | |
| 6. | **Completed 00**<br>**To continue, press ✳** | Press ✳. |
| 7. | **Go back onhook** | Place the handset on-hook. |
| 8. | ■■■ - ■■■ - ■■■■<br>**Enter line tel. num.** | Enter the telephone number of the terminal. |
| 9. | ■■■ - ■■■ - ■■■■<br>**Use ◆=FIX, ✳=SAVE** | Press ✳. |
| 10. | ■■■■■■■■■■<br>**Enter serial number** | Enter the ten-digit serial number of the terminal. |
| 11. | ■■■■■■■■■■<br>**Use ◆=FIX, ✳=SAVE** | Press ✳. |
| 12. | ■■■■■■■■■■<br>**Enter NCC tel. number** | Enter the telephone number of the Millennium Manager. |
| 13. | ■■■■■■■■■■<br>**Use ◆=FIX, ✳=SAVE** | Press ✳. |
| 14. | **Answer detect check**<br>**Go offhook** | Lift the handset off-hook |
| | **Checking answer detection** | |
| 15. | **Completed: 00**<br>**To continue, press ✳** | Press ✳. |
| 16. | **Go back onhook** | Put the receiver back on-hook. |
| 17. | **Press ✳ to start NCC download** | Press ✳. |
| | *** Please wait *** | |

**Table B-1: INSTALL quick reference (continued)**

| Step | Display | Action |
|---|---|---|
| | **Download in progress**<br>*** Please wait *** | |
| 18. | **Completed: 0X**<br>**To continue, press ✳** | Press ✳. |
| 19. | **Go offhook, press all buttons, then onhook** | Lift the handset off-hook. |
| 20. | **(keypad character)**<br>**Go on hook when done** | Press each keypad button. |
| 21. | | Put the handset on-hook. |
| 22. | **Please insert and remove your card** | Insert your test card, a valid mag-stripe card. |
| 23. | *** Please remove ***<br>**your card** | Remove the card. |
| 24. | **(card mag stripe #)**<br>**To continue, press ✳** | Press ✳ |
| 25. | **Install is complete**<br>**Close terminal now** | Lock housing and key lock. |

# Installation troubleshooting

This section describes how to troubleshoot the most common errors which occur during the INSTALL routine on a terminal.

| Error | Troubleshooting |
|---|---|
| The errors codes associated with installation downloading and answer supervision are 22, 24, 26, 34, 41, 42 and 51. | |
| **22: Busy modem**<br>Occurs when the terminal calls the Millennium Manager to perform a download and the modem is busy, you will see error 22. | Use the test hand set and dial out the modem number. This will indicate if the problem is inside or outside the terminal.<br>• If the problem is outside the terminal, you will get a continuous busy signal and **`modem busy`** will be displayed every time the you try to download.<br>Contact the system administrator to query the status of the modem.<br>• If the problem is inside the terminal, there will be no signal.<br>Replace the control PCP |
| **24: Data transmission problem**<br>• Occurs when the terminal calls the Millennium Manager to perform a download and there is a problem with the connection to the Millennium Manager. | Error 24 can occur at three different points in the download process:<br>• immediately as it is initiated, before the **`Please wait`** message appears — the data call was not started, retry the download<br>• at the beginning of the transmission process just after the **`Please wait`** message appears — the terminal has not yet been entered into the Millennium Manager<br>• a couple of minutes into the transmission — the terminal connected, but the line failed; retry the download |

| Error | Troubleshooting |
|---|---|
| **26: No ringback signal**<br><br>Occurs when the terminal calls the Millennium Manager to perform a download and the terminal detects no ringback signal. | Error 26 usually occurs immediately after the **`Download in Progress please wait`** message appears.<br><br>To troubleshoot error 26:<br>1. Use your test handset to test the CO line at the rear terminal pack.<br>2. If the line checks out, and there is no problem at Millennium Manager, replace the control PCP and run the INSTALL routine. |
| **34: Vital table missing**<br><br>Occurs when the terminals calls the Millennium Manager to perform a download and the terminal requires a table not yet downloaded from the Millennium Manager. | Retry the download.<br><br>If the problem continues, have the Millennium Manager system clerk set up the tables again, then retry the download. |
| **41/42: Central office (CO) line check**<br><br>Two error codes can be generated:<br>• Error Code 41 — The terminal does not detect voltage from the CO line. This could be a power source problem, or the handset could be defective.<br>• Error Code 42 — The terminal does not detect dialtone from the CO line. | Refer to the troubleshooting documentation for suggestions about troubleshooting:<br>• *Millennium terminals: maintenance troubleshooting*<br>• *Millennium terminals: pocket troubleshooting guide*. |

| Error | Troubleshooting |
|---|---|
| **51: Failed supervision test**<br><br>Occurs when the terminal calls the Millennium Manager to perform an answer supervision test. This error indicates the terminal could not establish answer supervision. | • Retry the answer supervision test.<br>• If the problem continues, use the test handset to test the CO line. Make sure the polarity light is on and dial out the modem number.<br>• If the problem is inside the terminal the polarity light will change, i.e. the polarity reverses.<br>You may need to replace the handset, telephony PCP or the control PCP.<br>• If the problem is outside the terminal then the polarity does not change.<br>Call dispatch to confirm that the line has been properly configured for local line side answer supervision.<br><br>***Note:*** If you perform the test, and you don't hear a click and see the polarity of the line reverse, you may need to replace the handset. |

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# U



# V



# W

Millennium Card-based terminals:

# Installing terminal hardware



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