Millennium Multi-pay-based terminals:

Installing terminal hardware

Document number: P0883896   Document issue: 00.01

Document status: Standard

Date: June 1998

This guide is for these multi-pay-based terminals:

- Coin basic w/o display (M1000)
- Coin basic with display (M1001)
- Multi-pay mag card (M1211)
- Multi-pay smart card (M1221)
- Multi-pay multi-card (M1231)
- Large-screen terminals using the multi-pay housing

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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

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This is the standard version of the *Millennium Multi-pay-based terminals: installing terminal hardware* module which is part of the of the installation, operation, and maintenance information for Millennium terminals.

This document contains the hardware provisioning and installation information for Millennium Multi-pay-based terminals, including the Coin basic w/o display terminal.

January 1997

This is the standard release for terminals based on firmware release MTR 1.9. This guide reflects an upgrade of the Millennium Manager platform to MSR 2.0. Changes from the previous release include several new firmware and system features:

October 1996

MSR 1.7 standard up-issue of this document to reflect the smart card alert, datajack, and IAS module features. This document is still applicable for terminals running on pre-MSR 2.0 systems.

February 1996

MSR 1.7 standard up-issue of this document.

April 1995

MSR 1.7 standard release of this document.

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Tables

1 Introduction

This document is intended for the craftspeople who mount and connect Millennium Multi-pay-based terminals on-site and connect the terminal to the central office (CO) line.

Coin basic w/o display terminal: This manual also includes the procedure for installing an internal portable display in the Coin basic w/o display terminal so the craft interface prompts can be viewed to perform the table download on coin basic w/o display terminals.

How this guide is organized

Millennium Multi-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 cen-

tral 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: **Coin basic w/o display** describes how to install and remove the portable display which is required to run the INSTALL routine for this type of terminal.

Chapter 5: **Installation flowcharts** provides quick-view flow charts for installing a basic Multi-pay terminal and a flow chart showing how to install the Coin basic w/o display terminal, including the portable display.

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 latest version of 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 Multi-pay-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 the following steps.

- selecting the site

- ensuring the site provisioning is correct

- ensuring any peripheral equipment required is connected to the central office (CO) 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 3** 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 (INSTALL routine)

- testing the terminal

A quick reference table of the INSTALL prompts is included in **Appendix B: INSTALL routine quick reference**. This appendix also includes a table listing the most common errors which occur during an INSTALL routine.

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 Multi-pay 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.

Figure 2-1: Backboard for terminal

Measurements
Outside edges:
width: 7.5 in. (19.05 cm)
length: 37.5 in. (95.25 cm)

Bolt holes to secure terminal to backboard (use as many as required)

Keyhole slots to fit mounting studs

Wiring access hole

Bolt holes for securing panel to the wall (use as many as required)

506-010
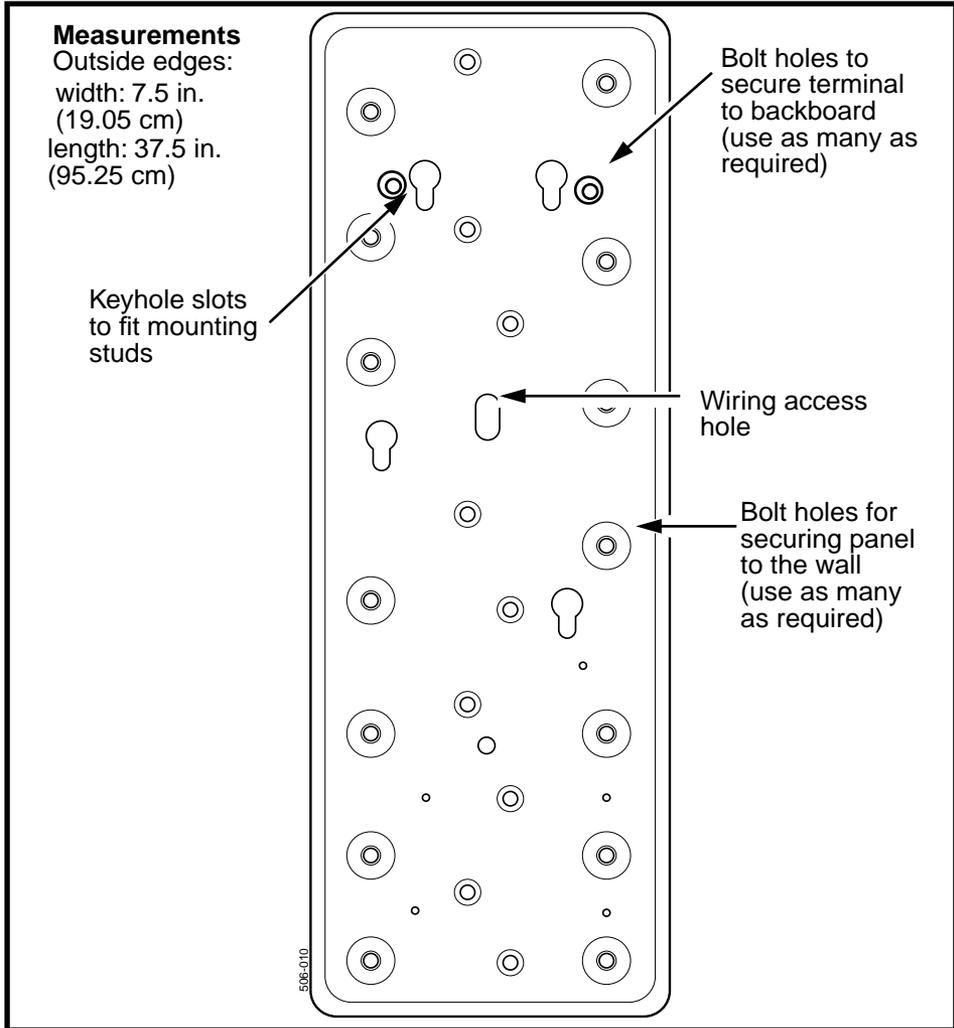
Selecting the proper fasteners

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 the backboard

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
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

Terminal specifications

This section provides specification information about Millennium Multi-pay-based terminals, including the Coin basic w/o display terminal and large-screen graphic terminals.

These specifications must be met for the terminal to work to the 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 present on the line, an inferred answer supervision (IAS) module must be installed in the terminal

• 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)
Large-screen terminal: 1.0 A, 24 V DC

— Acceptable start-up voltage: 19 V DC to 30 V DC

Note: Output resistance should be less than 10 Ω.

Maximum cable length specifications

Table 2-2 and Table 2-3 give the specifications for the cable length from the terminal to the power supply based on wire size for a single unit, assuming 24 V DC ±15% (±3.6 V DC) power source.

Note: Irregular performance could result if cables are too long, as a result of 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, 2-line display

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)	

Table 2-2: Cable length chart, 2-line display

> **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.

Large-screen terminals, require a larger power supply: 1.0 amp, 24 V DC ±15%.

Table 2-3: Cable length chart, large display

Gauge	Maximum length		Comment
#26	20.9 m	(68 ft)	See warning below
#24	33.2 m	(108 ft)	See warning below
#22	52.8 m	(173 ft)	
#20	84 m	(275 ft)	
#18	113.3 m	(372 ft)	
#16	212.1 m	(696 ft)	
#14	337.4 m	(1107 ft)	
#12	513.9 m	(1686 ft)	

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, you may need to pad each side of the line (Tip and Ring) with additional resistance. Suggested padding is 500 ohm

Suggested tools and equipment

Table 2-4 lists the tools and equipment used for the installation, maintenance, and testing of the terminal.

Table 2-4: Tools and equipment required

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
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
calibration coins, actual coins	test coin validator calibration
knuckle saver (lifter)	remove external instruction cards
small slot-head screwdriver	attach the tip and ring and power 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/voice chips on the control PCP
coin basic portable display	access craft interface prompts on the **coin basic w/o display 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 a TDD/TTY 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.

About the 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 inferred answer supervision (IAS) module must be installed in the terminal.

The IAS module connects between the outside line and the rear terminal PCP.

Power must be disconnected from the terminal to install the IAS module.

- The section below describes installing the module.

- **Chapter 3** describes connecting the module to the inside service wires (ISWs).

Installing an IAS module

The following procedure describes installing an IAS module into a terminal before it is installed on-site.

Figure 2-2 shows the placement of the IAS module inside the rear housing of the terminal. Note that the J1 and J2 connectors are at the top of the board.

Figure 2-2: Locating the IAS module in the rear housing
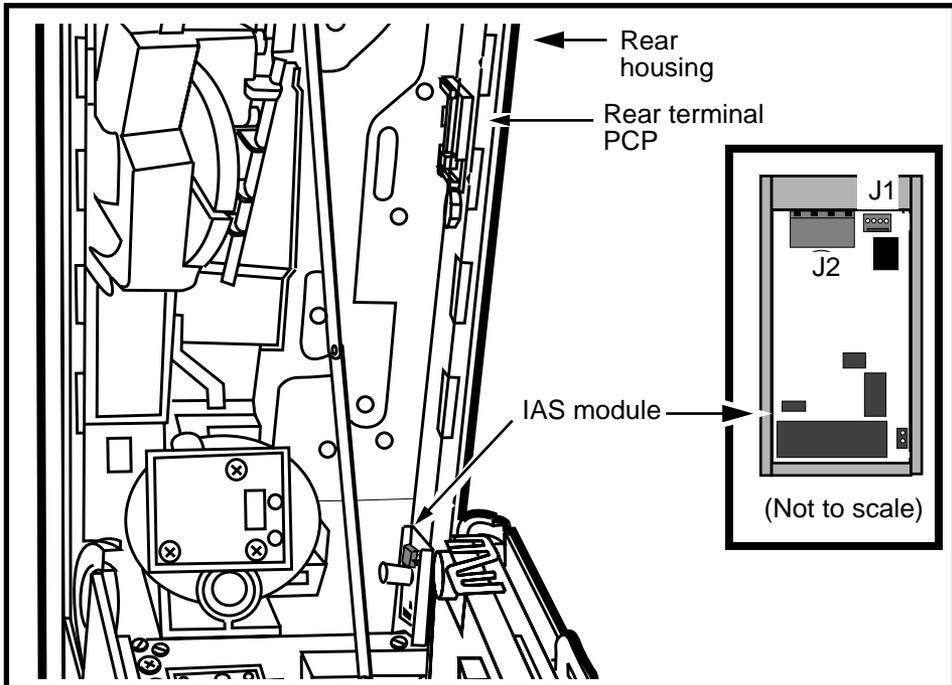
Follow these steps to install an IAS module into an uninstalled terminal:

1. Unlock the terminal and open the housing.

2. Remove the flat self-adhesive cable retainer from the side of the terminal below the rear terminal PCP.

3. Check the placement of the IAS board mount.

    a) Slide the IAS PCP out of the board mount.

    b) Leave the protective paper of the board mount, and position the mount on the side of the terminal.

    c) Set the bottom of the mount on the side of the terminal directly above the top of the vault area. The connectors on the IAS module will face up, towards the rear terminal PCP.

    d) Take the board mount out.

    e) Remove the protective paper from the adhesive foam on its back.

    f) Firmly press the board mount to the side of the terminal, where you placed it in **step 3c**.

4. Insert the interconnect cable into J1 on the IAS PCP.

    Ensure that the cable sits into the connector so the black wire is in the tip position, shown in the inset in Figure 2-3.

5. Slide the IAS PCP into the board mount so that connectors J1 and J2 are at the top of the board.

6. Attach the interconnect cable wires from the IAS (J1) into the upper terminal block on the rear terminal PCP (J28).

    Position the cable along the back of the terminal so that it does not interfere with the PCP assembly when the housing is closed.

Figure 2-3: Diagram of the IAS module line connections
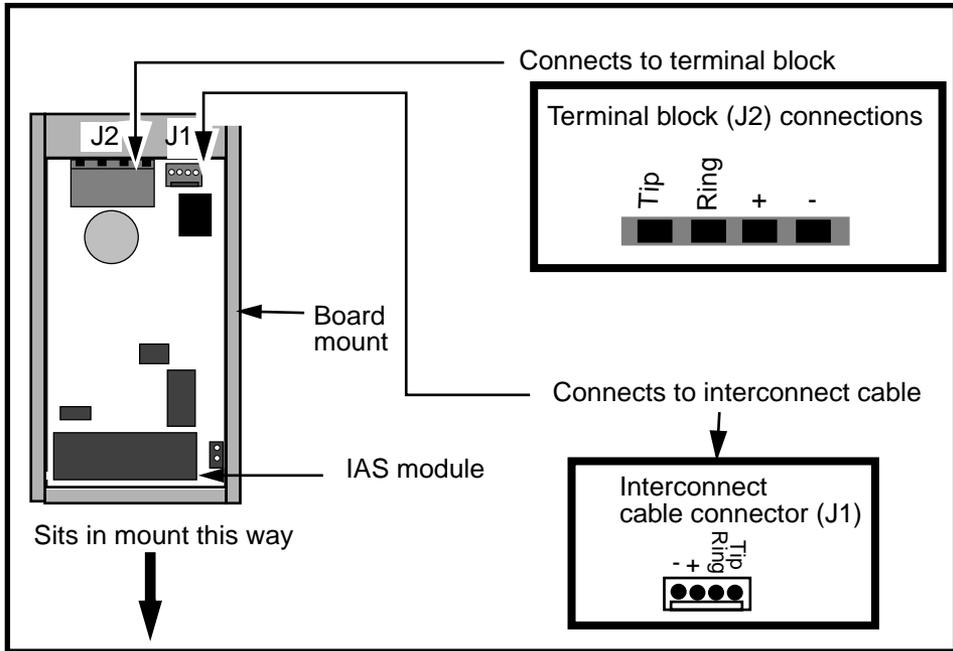
7. To prevent the IAS PCP from sliding up in its mount, insert a cable tie through the hole at the top of the IAS board mount and tie its ends together. Trim off the excess.

8. Refer to **Connecting power to an IAS module** on page 3-16 to connect power to the terminal.

Installing a lock on the terminal

The upper housing lock of the Multi-pay-based terminals is customer-specific, so it may need to be installed on the terminal by the customer.

To install the lock, follow these steps:

1. Make sure the key operates the lock.

2. From the inside of the terminal, insert the lock so the key entry protrudes through the round hole in the front housing.

   The four mounting holes should align with the four threaded holes in the cover plate.

   Refer to Figure 2-4.

Figure 2-4: Securing the upper housing lock to the terminal
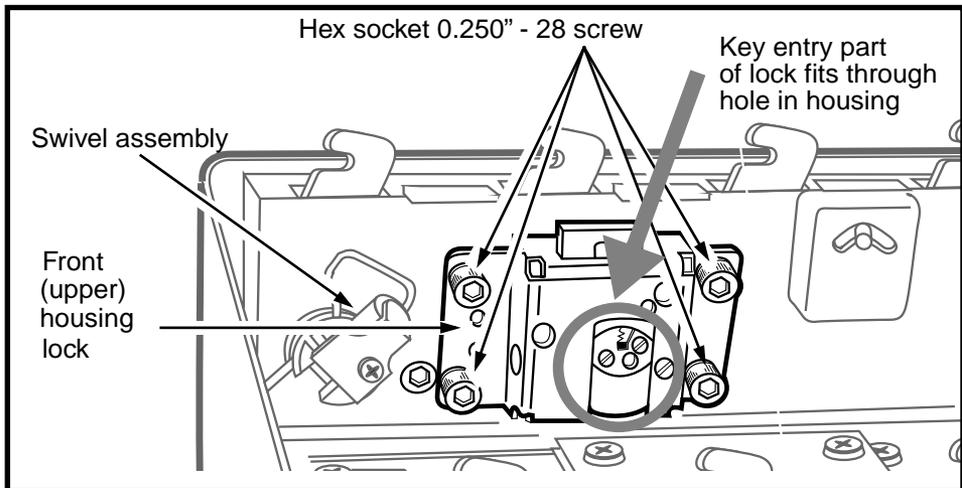
3. Insert the four screws and tighten the hex nuts onto the screws.

4. Before you completely tighten the bottom, left hex nut, insert the grounding strap under the hex nut.

   Note: The grounding strap is secured between the swivel and the lock, as shown in Figure 2-5.

Figure 2-5: Securing the grounding strap to the swivel and lock
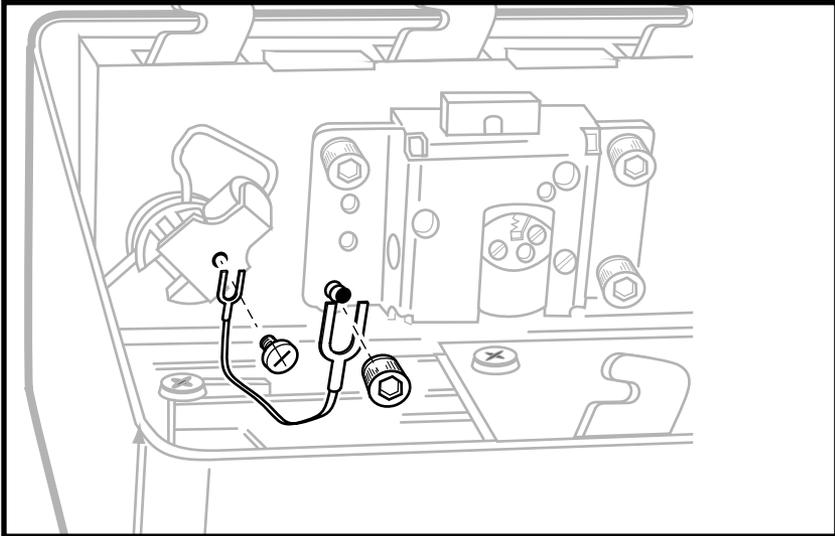
5. Tighten all the swivel screw and the lock hex nut snugly.

6. Lock and unlock the lock without closing the terminal to ensure that the lock works.

Identifying your terminal type

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

Refer to Figure 2-6.

- 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.

Figure 2-6: Locating the product ID label
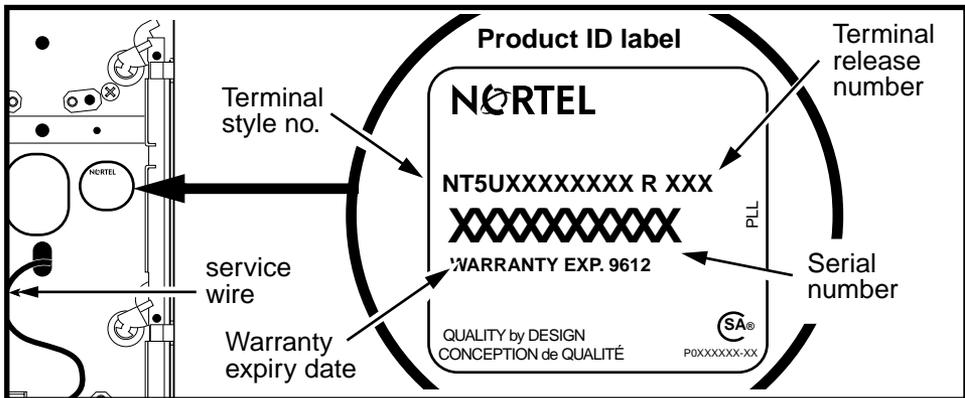
Telephony/control board identification

The following table lists the label color and the product engineering code (PEC) that appears on control and telephony printed circuit packs (PCPs):

Table 2-5: Telephony/control PCP labels

Board type	PEC	Color
Multi-pay multi-application control PCP	Will vary	Brown
Datajack telephony PCP	NT5U4045	Yellow
MTR 1.7: Datajack control PCP	Will vary	Blue

Table 2-5: Telephony/control PCP labels

Board type	PEC	Color
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.		

Supporting documentation

For more detailed information about the terminal features or about provisioning the terminal, including recommended switch settings, refer to the following documentation:

- for a description of all Millennium terminal 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 procedure 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 to obtain a table download. This process is described in *Millennium terminals: using the craft interface*, Chapter 2.

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

Coin basic w/o display terminal: This chapter also includes cues for installing an internal 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)
- 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 back-board, you must install one. Refer to **steps** to

Figure 3-1: Terminal backboard mounting holes

Bolt holes for securing panel to the wall

Keyhole slots to fit mounting studs

Wiring access hole

Measurements

Outside edges:
 width: 7.5 in. (19.05 cm)
 length: 37.5 in. (95.25 cm)
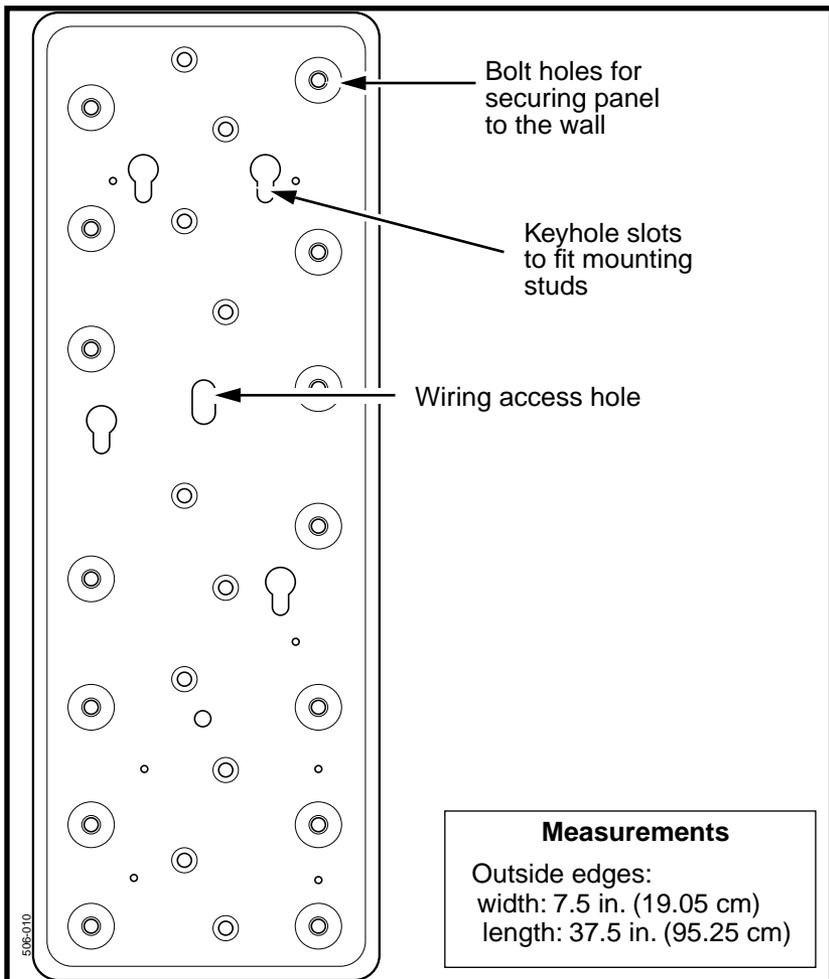
Follow these steps to install a backboard:

1. Select the proper fasteners for the furniture or wall material. Refer to Table 2-1 on Page 2-5, 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 and level.

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 make sure the telephone line is supplying tip and ring and the proper level of supplementary power. These specifications are listed in **Terminal specifications** on page 2-5.

*   Use your butt-end set to test the telephone line to the terminal for answer supervision

*   If the line does not have answer supervision, you will need to install an IAS module, which is described in **Installing an IAS module** on page 2-10.

*   Use a multimeter to test the voltage of the supplementary power supply.

DANGER ⚠	**Do not** install a terminal during a lightning storm
	Do not install telephone jacks in wet locations, unless they are designed for wet locations
	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 procedures describe how to install a Millennium Multi-pay-based terminal onto the backboard and how to power it up.

CAUTION ⚠	• The Millennium Multi-pay terminal must be mounted on a vertical surface.
	• A tilt greater than 1.5 degrees in any direction may cause malfunction.

A. Positioning the terminal on the backboard

This procedure assumes the backboard is mounted 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 that the bare wires will not touch the internal components when you insert the wires into the terminal.

CAUTION ⚠	Observe normal electrical wiring precautions when handling the wires.

2. Feed the wires through the access hole in the back-board.

3. If they are not already installed, insert four security studs in the threaded holes in the back of the mounting plate of the terminal rear housing. Refer to Figure 3-2.

Figure 3-2: Attaching studs to back of terminal
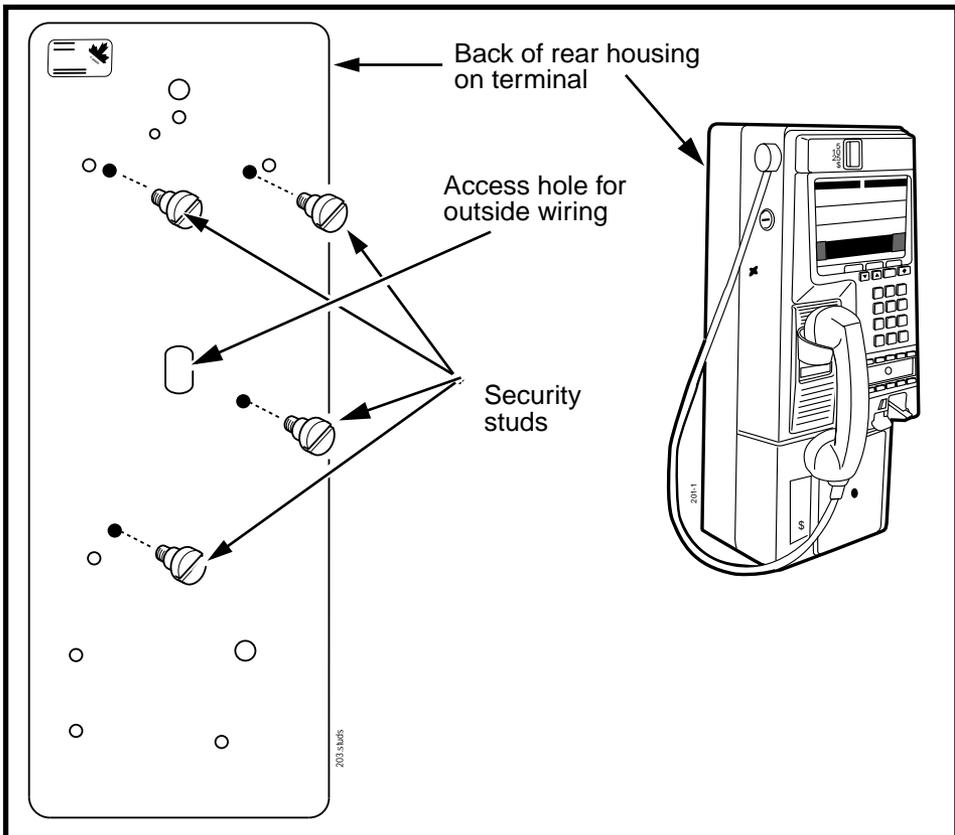
4. Lift the terminal and position it in front of the back-board.

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.

DANGER ⚠	Make sure the ISWs are slanted down towards the bottom of the terminal to prevent interference with the electronic boards.

6. Insert the security studs in the keyhole slots in the backboard.

7. Let the terminal slide down into position.

    Refer to Figure 3-1 for keyhole positions on the back-board.

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 3-3 shows the position of the locking mechanisms on the terminal.

1. Put the key in the lock on the upper terminal housing.

2. Turn the key clockwise to unlock the lock.

See this 👓	If it is difficult to turn the key, insert the T- or L-tool into the hole below the key lock hole and apply a slight force counterclockwise to relieve the pressure on the key. At the same time, turn the key clockwise.

3. Release the housing mechanism.
    Insert the T- or L-tool into the hole below the key lock, and rotate the tool clockwise until it stops.

Figure 3-3: Keys to open the terminal housing
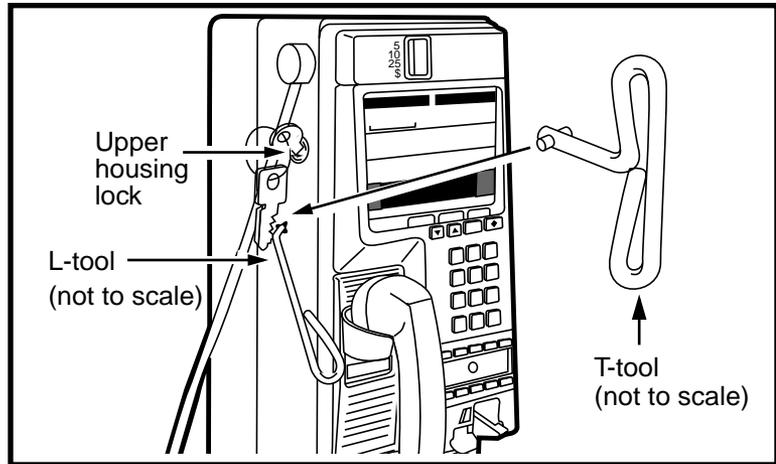
4. Remove the handset from its cradle and let it hang by the armored cord.

5. Grasp the front housing assembly firmly by both sides and tip it forward until it clears the rear housing.

   Allow the front housing to hang. Refer to Figure 3-4.

   In the fully opened position, the weight of the front housing is supported by the link assembly, which is a removable tie-rod attached to the front and rear housing.

6. Attach your ESD strap to the connection point inside the terminal indicated in Figure 3-4.

Electrostatic discharge (ESD) precautions	• To prevent damage to the ESD-sensitive devices inside the terminal, wear your ESD wrist strap. • Refer to Figure 3-4. Attach your ESD wrist strap to either the left or right strike plates inside of the rear housing assembly.

Warning ⚡	• Disconnect power at the rear terminal PCP before disconnecting any other cables. • Do not reconnect power until you are ready to close the terminal.

Figure 3-4: Terminal housing in open position

Coin validator

ESD connections (strike plates)

Escrow

Telephony PCP (Control PCP is on the other side of the PCP assembly)

VFD

Front housing hanging down, supported by link assembly

Rear housing (attached to wall)

Rear terminal PCP

Link assembly supporting front housing assembly

Keypad PCP

PCP assembly (Telephony/control PCPs)
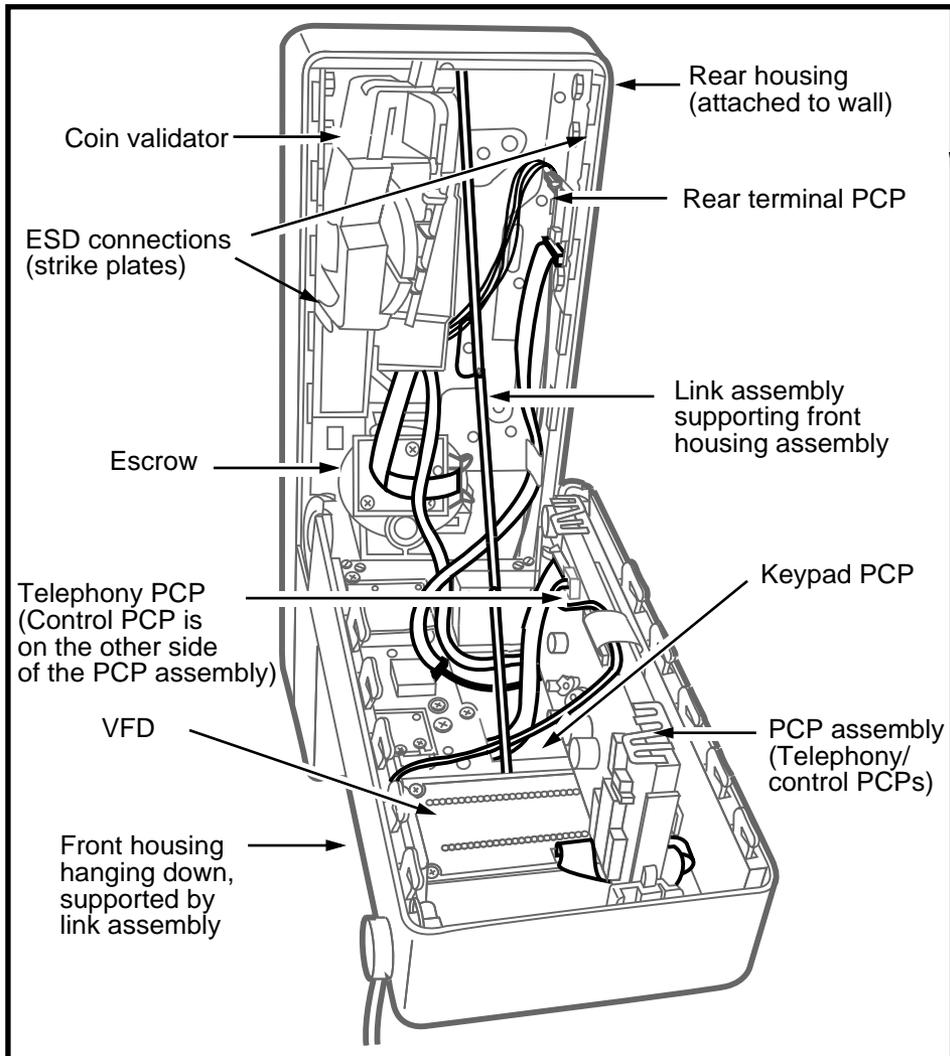
7. Pull the ISWs all the way into the terminal and position them so they are not touching any of the boards.

See this	Serial number
	The serial number of the terminal is located on the product ID label on the rear housing. This number is required for the software INSTALL routine.

8. Secure the housing assembly to the backboard using two pan-head machine screws.

   • The location of these first two holes in the rear housing are shown in Figure 3-5.

   • Use 1/4-inch no. 20 1/2-inch-long screws.

Figure 3-5: Securing the rear housing to the wall

Rear housing

Machine screw locations

Validator has been removed

Access hole for inside service wires

Escrow

201-32
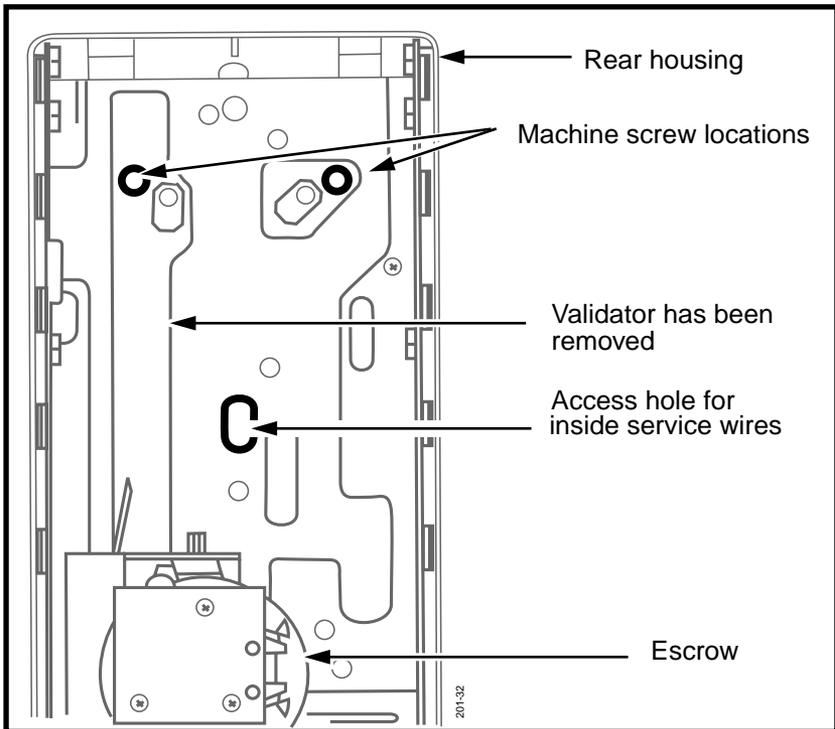
9. To attach one of the screws, you need to remove the coin validator. Refer to Figure 3-5.

   a) Disconnect the validator cable (J33) from the control PCP connector (J8). Refer to Figure 3-6.

      — Disconnect the cable to the escrow (J21) from the escrow connector (PL5).

      — Keep the bend in the cable leading to J7; this ensures the cable will not get pinched when the front housing is closed.

      — Refer to Figure 3-6 to see where the various components are.

   b) Remove the rubber spacer between the validator and the top of the rear housing, if it is present.

Figure 3-6: Coin validator cable connections
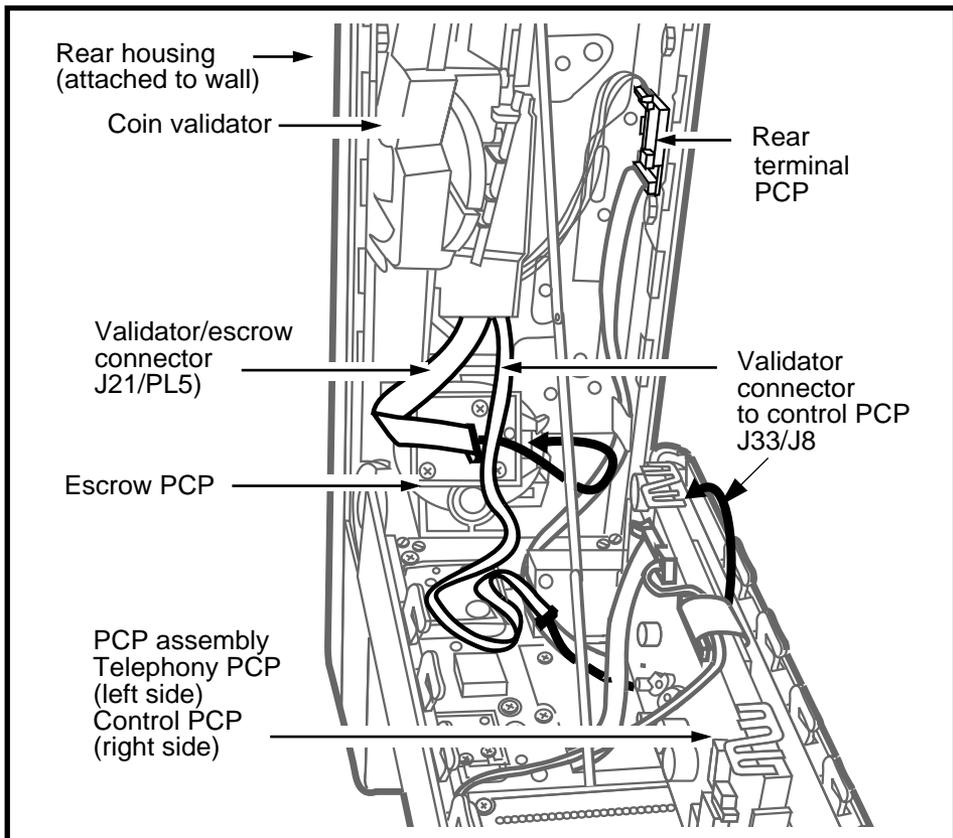
c) Remove the plastic retainer strip located between the reject chute and the housing of the validator, if it is present. Discard the retainer. The retainer is required for protection during transportation only.

d) Release the retaining clip securing the validator to the escrow, indicated in Figure 3-7.

Figure 3-7: Locating the validator retaining clip

Rear housing

Validator

Validator
coin return chute

Projection on escrow

Validator retaining
clip

Validator slides into
escrow chute here

Escrow
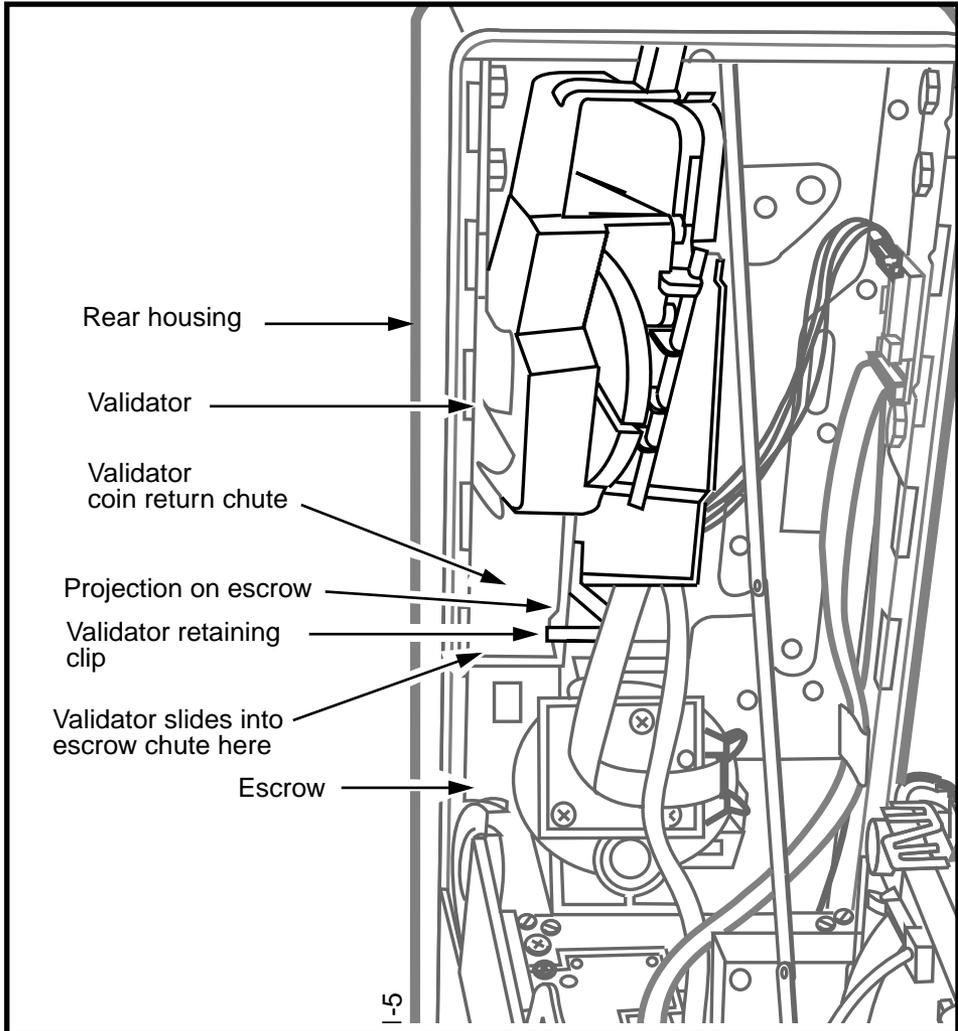
e) Slide the validator up until the large portion of the keyhole on the validator is aligned with the validator retaining screw. Refer to Figure 3-8.

f) Remove the validator by tilting it outward at the top, then lifting it up and out of the rear housing.

Figure 3-8: Removing the coin validator
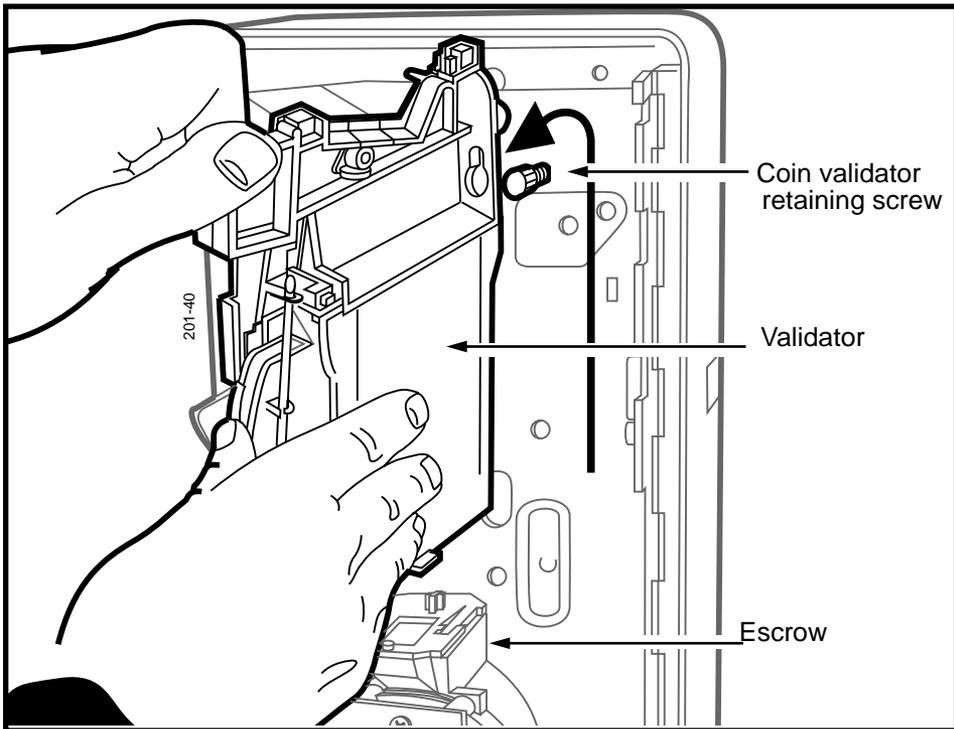
10. Insert the second pan-head screw into the hole uncovered by removing the validator.

11. Install remaining fasteners until the terminal is secure.

12. Replace the validator by reversing the steps in **step 9**.

Before setting the validator keyhole on the screw, slide the coin rejection chute on the validator into the top of the coin chute on the escrow as indicated in Figure 3-7.

C. Connecting the outside line

Once the terminal is secured on the wall or into a piece of furniture, it 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 your wrist strap lead to an ESD connection point inside the terminal. Refer to Figure 3-9.
	An alternative connection point is attaching to the key in the lock.

Figure 3-9: ESD connections inside the terminal
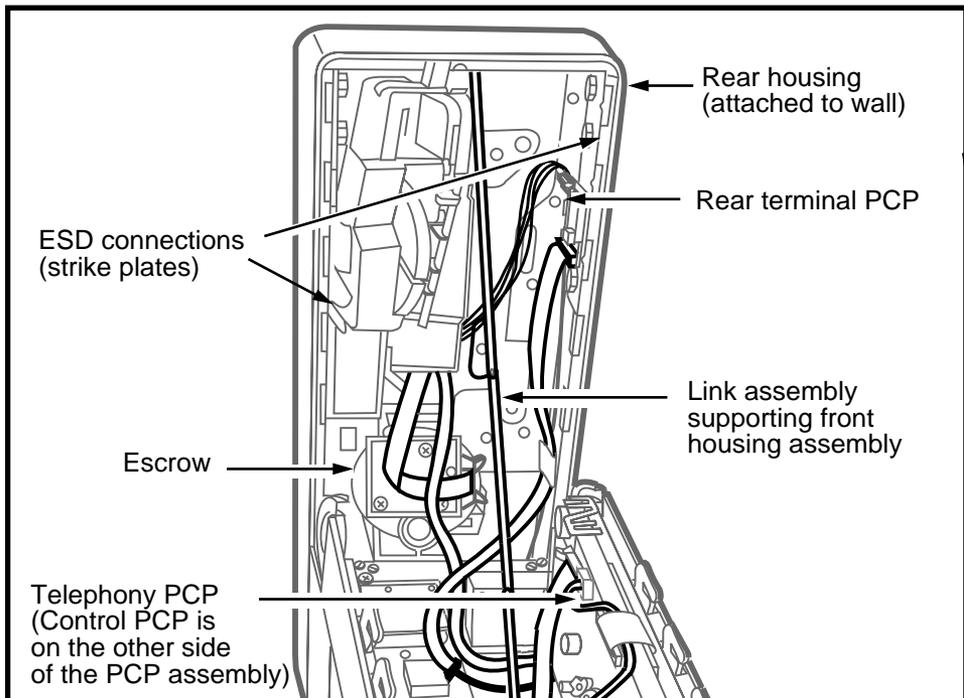
The following procedure describes the process of attaching the ISWs to the terminal block.

1. Disconnect the rear terminal PCP (J18) connector from the connector on the control PCP (J5).
    This is to ensure power is disconnected from the terminal for succeeding steps.

See this	It is not necessary to ground the terminal during installation. If the terminal is inadvertently grounded, it still works. Compliance with both UL and FCC specifications are met with or without a ground.

2. Locate the terminal block on the rear terminal PCP, which is on the right side of the rear housing. Refer to Figure 3-10.

Figure 3-10: Reconnecting the upper terminal block

Rear housing

Rear terminal PCP

ISWs

Upper terminal block attached to lower terminal block

Ribbon cable connects to control PCP
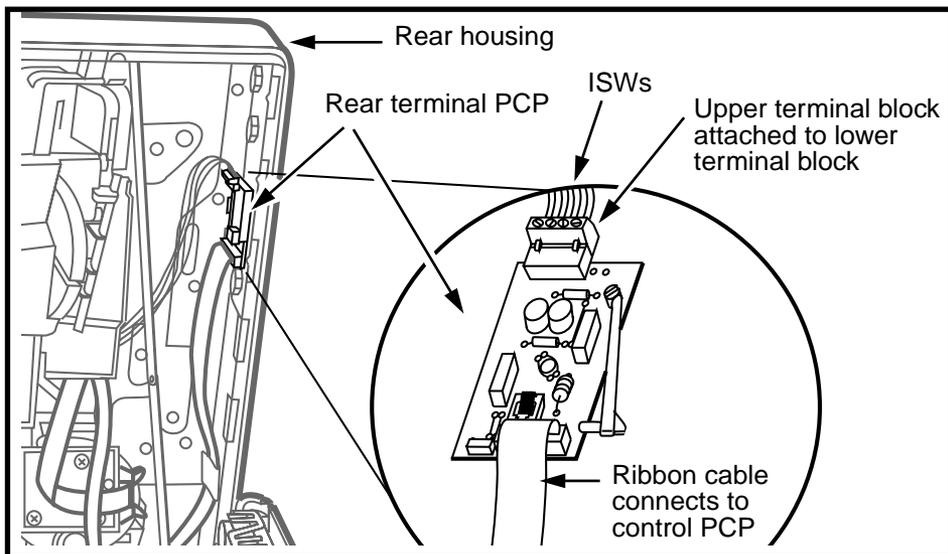
3. Pull off the upper terminal block and snap it to the upper arm of the link assembly, as shown in Figure 3-11.

   This secures the upper terminal block in place so you can attach the service wires.

Figure 3-11: Connecting ISWs to the terminal block
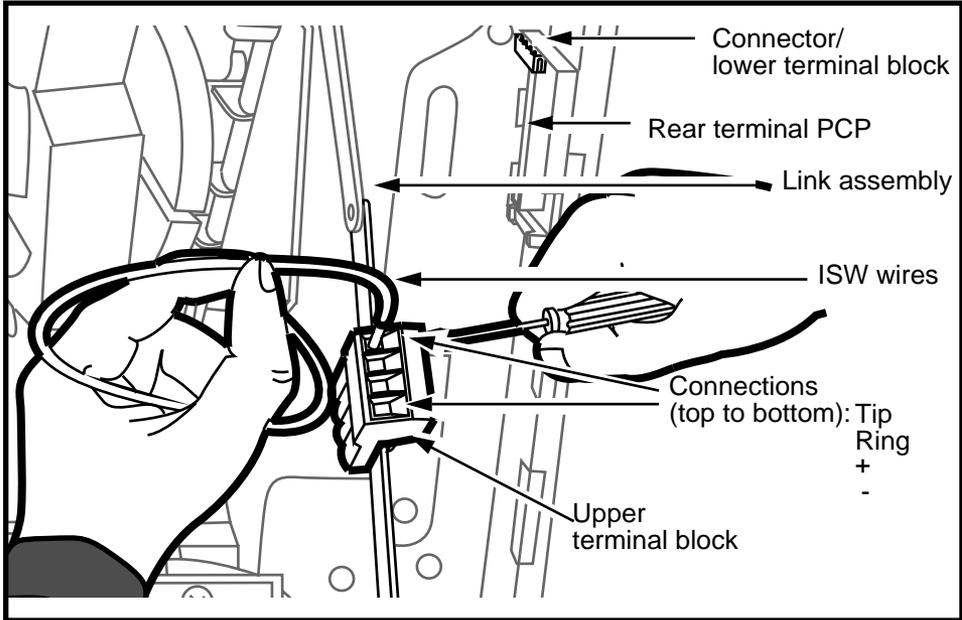
4. Remove the tape from the ISWs and strip the end of each wire.

5. Connect the service wires to the terminal block. Use a small screwdriver to connect the leads.

   There are tip and ring terminals, and positive and negative terminals for the supplementary power supply, these connections are shown in Figure 3-11.

See this	**Power is disconnected from the terminal**
	Leave the upper terminal block attached to the link assembly until you are ready to close the terminal.

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**, below.

CAUTION ⚠ **Installing inside service wires**	• When connecting the supplementary power wire, ensure that the proper polarity is achieved. Reverse polarity does not cause damage, but the terminal does not work. • Observe the usual electrical precautions when working with the wiring. • Conceal the outside wiring cables near the telephone or use approved moulding or tubing. • Locate protectors and connecting blocks where they will be 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 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. Plug the interconnect cable from the IAS connector (J1) into the connector on the top of the rear terminal PCP (J28).

2. Position the cable along the back of the terminal so that it does not interfere with the PCP assembly when the housing is closed.

3. If they are not already attached, connect the inside service wires to the terminal block that connects to the IAS module.

   a) Pull the inside service wires (ISWs) through the oval 25 mm by 12.5 mm (1 in. by 1/2 in.) wiring access hole beside the coin validator in the rear housing assembly.

   b) Grasp the top portion of the terminal block and pull it carefully away from the board.

   c) Snap the block to the upper arm of the link assembly. This secures the upper terminal block in place so you can use both hands to attach the wires.

   d) Remove the insulating tape from the ISWs and strip the end of each wire.

   e) Connect the ISWs to the terminal block. Use a small screwdriver to connect the leads.

WARNING	**DO NOT CONNECT** the terminal block to the IAS module until you are instructed to plug it in at the end of this procedure.

4. Route the ISW to the bottom of the rear housing to prevent interference with the PCP assembly.

5. To prevent the IAS module from sliding up in its mount, insert a cable tie through the hole at the top of the IAS board mount and tie its ends together. Trim off the excess.

D. Installing internal components

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

See this	**Coin basic w/o display terminal:** It is also necessary to remove or lift the PCP assembly to install the Coin basic portable display.

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. First, confirm that the following has been done:

    *   Your ESD wrist strap is connected to an ESD-ground-ing point inside the terminal. Refer to Figure 3-4.

    *   The upper terminal block is disconnected from the rear terminal PCP or the IAS module, if there is one. Snap the upper terminal block to the link assembly to keep it out of the way.

2. Refer to Figure 3-12 and disconnect the cables from the control and telephony PCPs. These connections are described in Table 3-1.

Table 3-1: Cable connections on telephony/control PCPs

Disconnect this cable	from connector
Remove this cable first. **Reconnect this cable last.** J18, rear terminal PCP	J5 on the control PCP
J15, handset	J10B on the telephony PCP
J53, keypad PCP * J53 on the external interface hookswitch module	J1A on the telephony PCP

Table 3-1: Cable connections on telephony/control PCPs (continued)

Disconnect this cable	from connector
J19, card reader	J6 on the control PCP
J20, VFD display	J7 on the control PCP
J33, coin validator PCP	J8 on the control PCP
Optional features	
If the terminal has an IAS module, the outside line is attached to that module.	
Datajack: datajack module cable	J34 on the telephony PCP
Smart card alert:	
J14, disconnect the alerter cable	J3 on the smart card alert daughter board
	** J3 on the multi-application control PCP
J38, keypad cable	J2 on the smart card alert daughter board
	** J2 on the multi-application control PCP
* there are two types of keypad PCPs, this one connects to the external interface hookswitch module with a clear mylar cable.	
** multi-application control PCPs do not require a daughter board	

If you are unsure of cable connections, look for the name of the connection printed on the PCP.

Figure 3-12 shows the cables which connect to the PCP assembly on a standard Millennium Multi-pay terminal.

Figure 3-12: PCP assembly cable connections
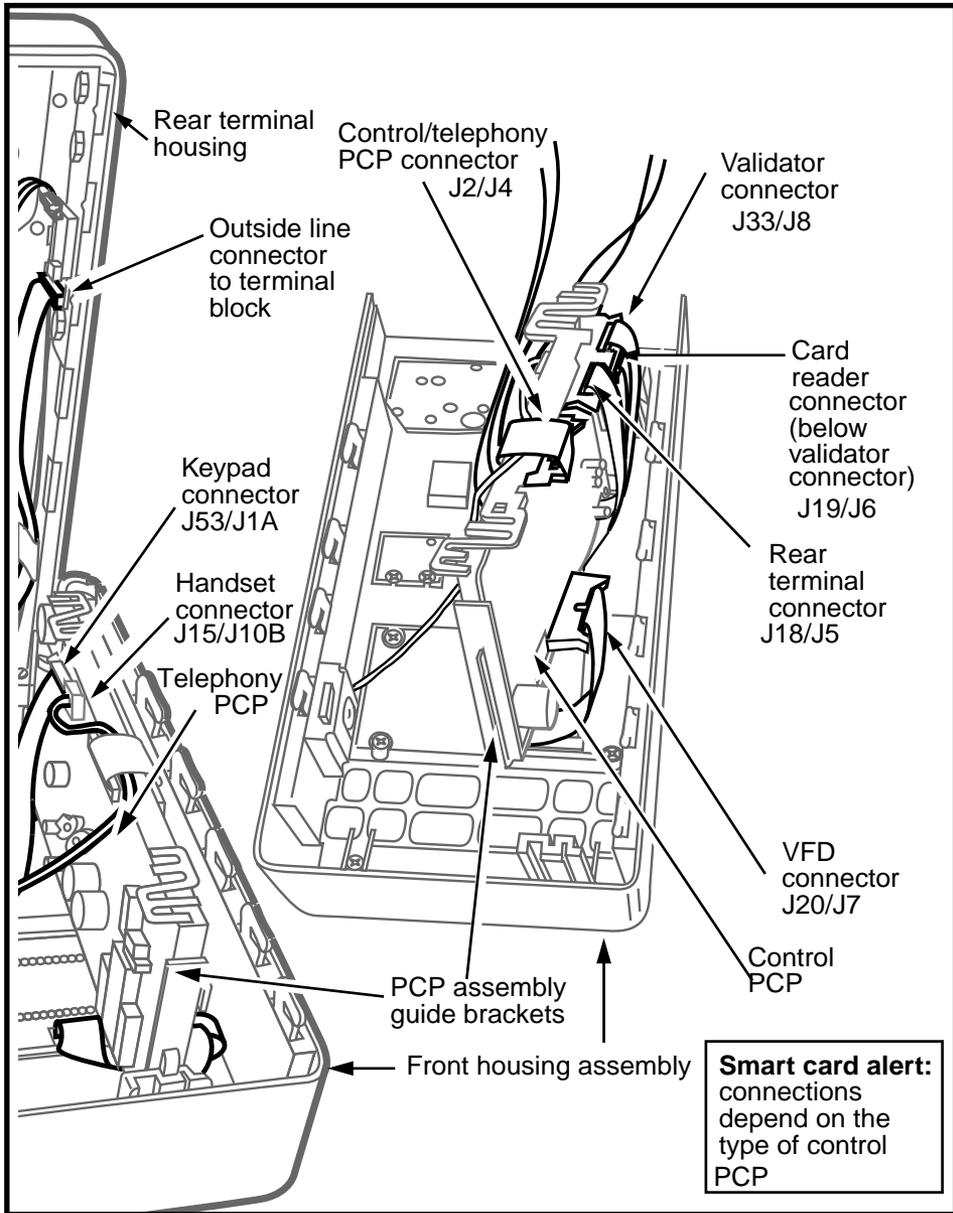
3. Remove the PCP assembly by sliding it up and out of its guide brackets, as shown in Figure 3-13.
    You may need to gently press the guides away from the PCP assembly to free it.

    • Store the PCP assembly in an anti-static bag.

(ESD) precautions	• Wear your ESD wrist strap at all times.
	• When working with the board separately from the PCP assembly, keep the parts you are not working with in an anti-static bag.
	• Never put boards on top of each other.

Figure 3-13: Removing the PCP assembly

WARNING:
Wear a grounded ESD strap when working inside the terminal.

PCP assembly

Brackets

Grasp assembly by plastic edges and lift straight up

201-110
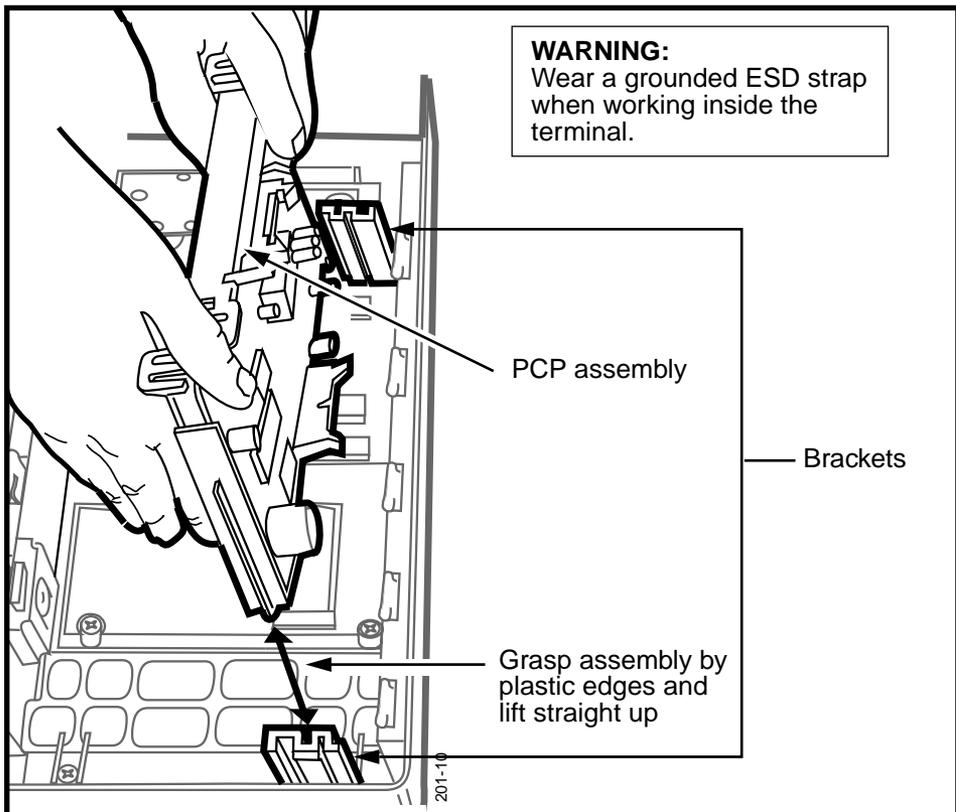
4. Install any upgrade features at this point, such as the **IAS module** or the **smart card alert**, if they were not installed during pre-mounting installations.

See this ⌐◯◯⌐ **Vintage alert**	Terminals with the **multi-application control PCP** can support both a datajack module and the smart card alert.
	You can identify this board because the smart card alert connectors are on the control PCP.

Installing an internal instruction card

If the operating company has decided to use **internal instruction cards**, install them now, as follows:

1. Support the ID bezel on the exterior of the terminal with one hand

2. Remove the two screws inside the housing assembly which secure the ID bezel. Refer to Figure 3-14.

3. Remove the ID bezel from the front of the terminal.

Figure 3-14: ID bezel screws secure the clamp plate
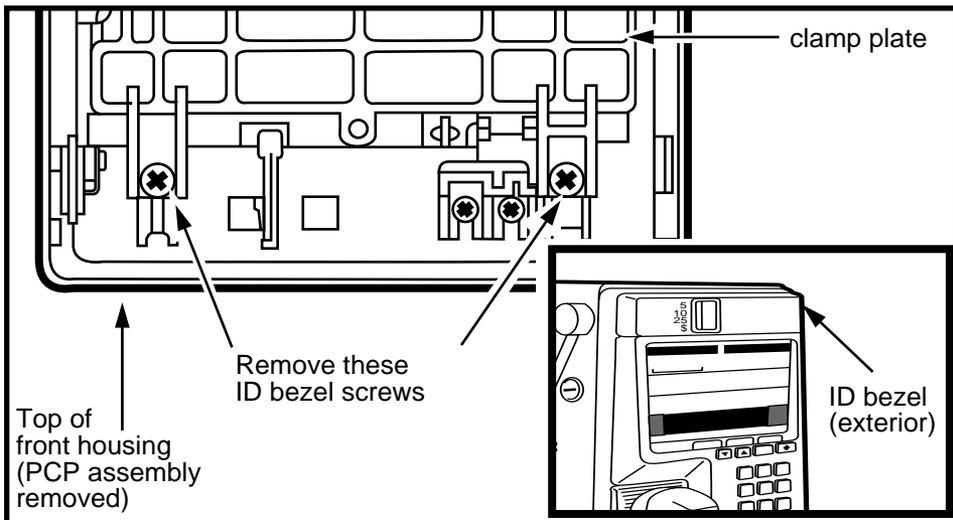
4. Remove the clamp plate, which has the VFD assembly attached to it. Refer to Figure 3-15.

Figure 3-15: Removing the clamp plate

VFD
(attached to
clamp plate)

Clamp plate

Top of the front
housing

201-42
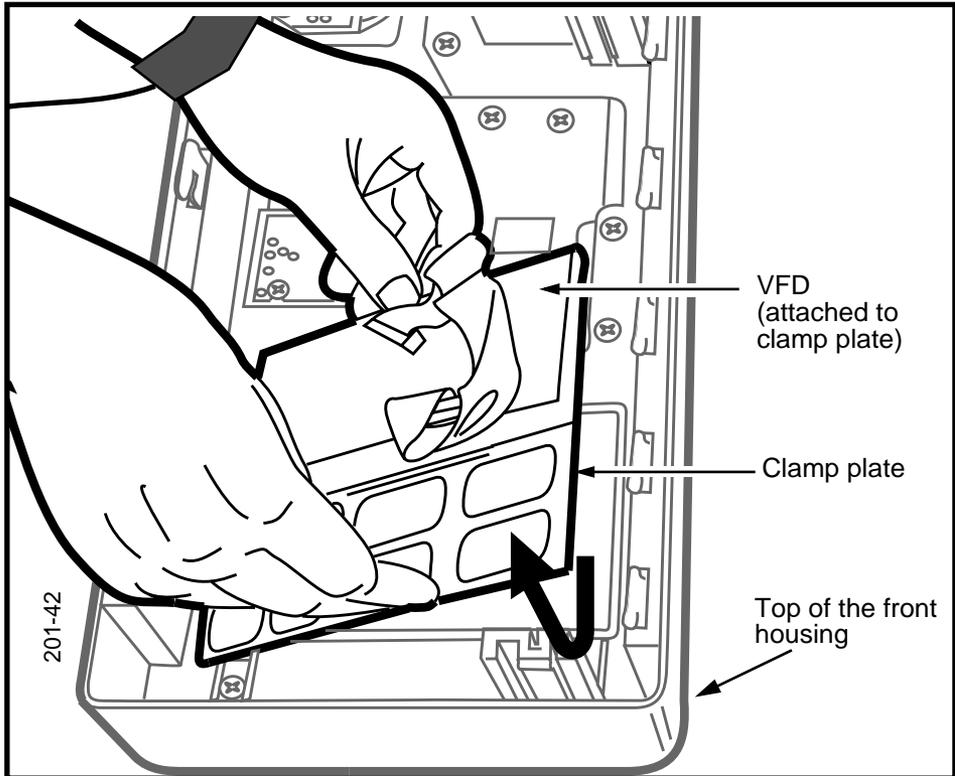
5. Set the internal instruction card against the display window, with the instructions facing the exterior of the terminal.

See this	Coin basic w/o display
	If you plan to do the INSTALL immediately after mounting the terminal, do not insert an internal instruction card at this point.
	Do install the internal portable display. Detailed instructions for this procedure are given in Chapter 3.

6. Align the notch in the lower edge of the card and the hole in the tab at the top of the card are properly located over their corresponding pins on the upper bezel.

7. Return the clamp plate to its proper position. Keep the bend in the cable for the VFD connector (J20).

8. Reassemble the ID bezel

    •   Ensure that the coin slot gasket is fitted properly over the opening

    •   Replace the two screws inside the front housing assembly to secure the ID bezel and clamp plate.

See this	**Coin basic w/o display terminal**
	If you intend to perform the software INSTALL routine as soon as the terminal is mounted, you will need to install a portable display at this point.
	The section **Installing the Coin basic portable display** on page 4-2 describes this procedure.

Installing a quick access keys label

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

Figure 3-16 shows the two types of quick access key bezels.

Figure 3-16: Quick access keys bezels
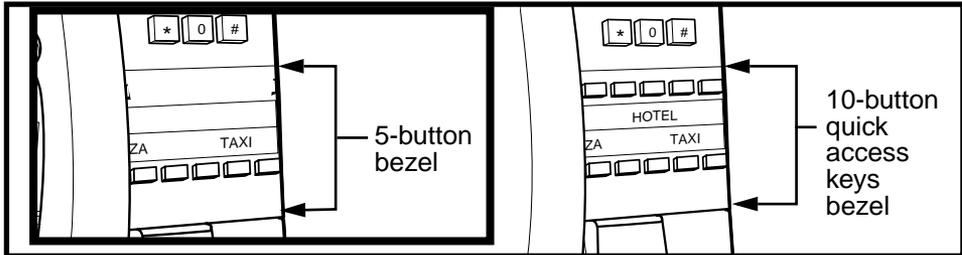
If the terminal has **quick access keys**, follow these steps to install the label card:

1. Push on the round rubber stud between the two screws securing the quick access keys bezel.

   This stud is indicated in Figure 3-17.

   This will bend the label window outward until the centre of the window is high enough to grasp.

Figure 3-17: Rubber stud pushes against window
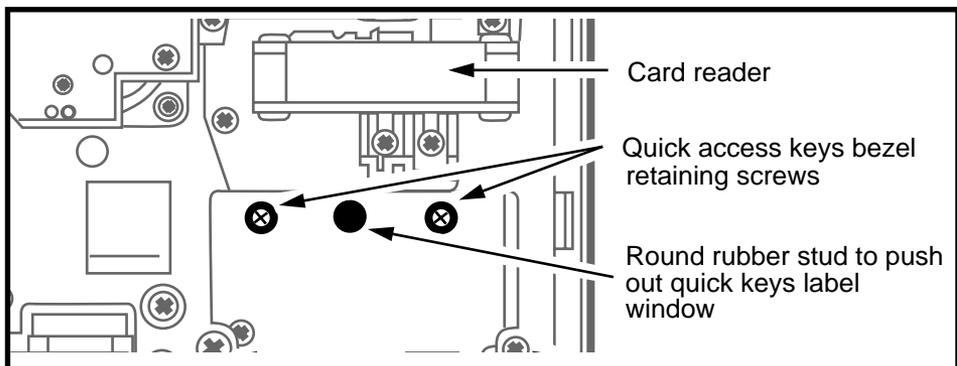
See this	**Vintage alert**
	Newer terminals do not have access to the rubber stud on the inside of the terminal.
	In this case, the window must be pried out from the front.

2. Pull the window out.

3. Insert the card behind the window.

4. Insert one end of the quick access keys label window in position in the opening in the quick access keys bezel.

5. Bend the window outward.

6. Insert the opposite end into position and release it.

Installing the number card

The number card which identifies the terminal phone number is located under the handset on the hookswitch bezel.

Figure 3-18: Locating the number card
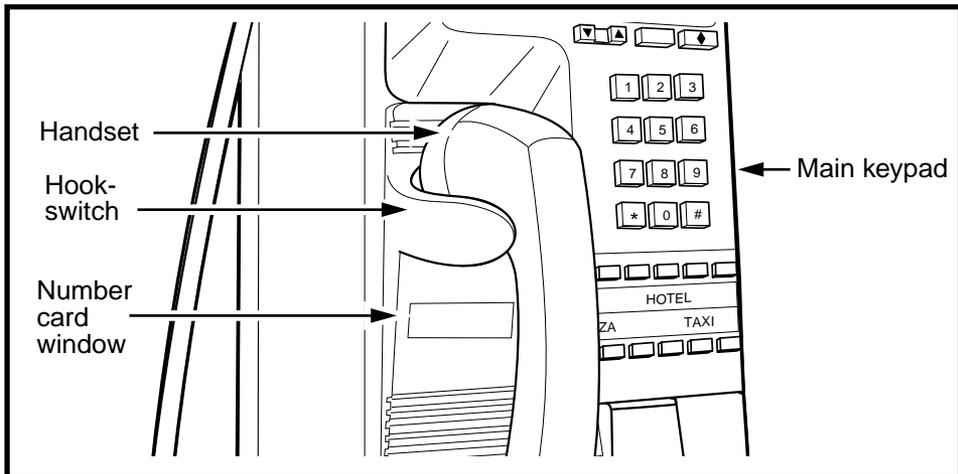
To install or replace the number card, follow this procedure:

1. Remove the number card window.

   Use a type 1A cross-recess screwdriver of less than 8 mm (5/16 inch) diameter or an equivalent tool to push on the window from inside the terminal.

   Refer to Figure 3-19 to locate the hole.

2. Push until the number card window is free of the alerter bezel.

3. Insert the number card behind the window.

4. Insert one end of the window in position in the opening of the alerter bezel.

5. Bend the window outward.

6. Insert the opposite end into position, and release it.

Figure 3-19: Number card access hole
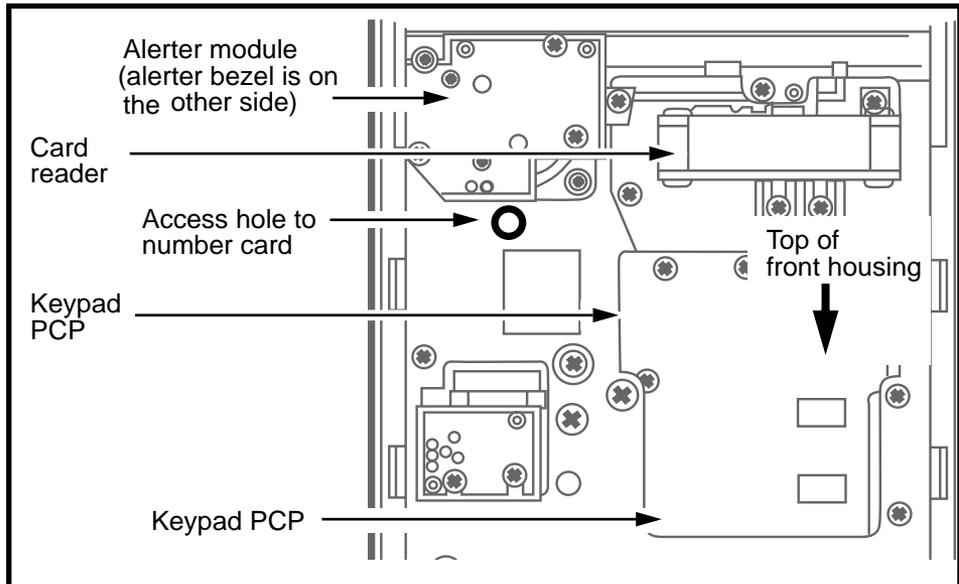
E. Completing the installation

The following section describes the process of returning the terminal to a state where it is ready for the INSTALL routine, which is described in detail in *Millennium terminals: running the craft interface*.

1. Re-install the PCP assembly by reversing the steps in **Installing internal components** on Page 3-18.

    •   Ensure that the rear terminal and validator cables are threaded under the PCP assembly before you seat it back into the brackets in the terminal.

    •   You should hear a click when the assembly is fully seated in the brackets.

See this ⌐⌐ **Installing a SAM**	**E-purse applications** For e-purse applications such as SmartCity, you must install a SAM into a socket on the SAM daughter board, which is attached to the control PCP. *Note:* **The power must be disconnected before you install or remove a SAM module.**

Figure 3-20: Control PCP showing SAM sockets

SAM sockets on removable SAM daughter board

Multi-application control PCP
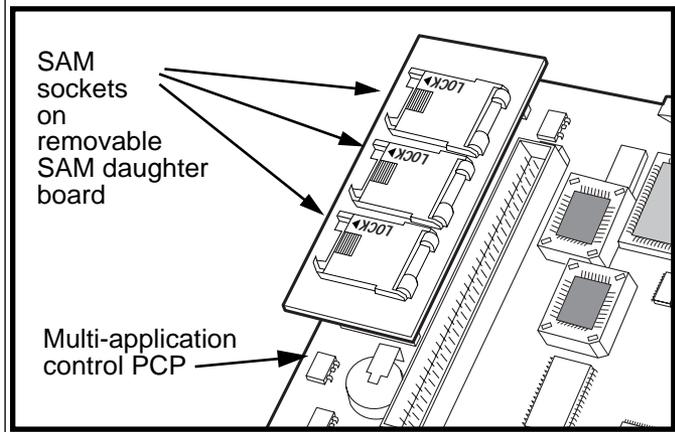
1. Unlock the SAM socket by sliding the plastic lock tab toward the body of the unit.

2. Lift up the flap of the socket.

3. Install the new SAM into the socket.

   Note: The SAM can only go in one way. It should slide in easily. Do not try to force it into the socket if it does not seem to fit.

   Refer to Figure 3-21 for proper positioning of the SAM into the socket.

4. Close the socket and slide the lock back in place.

Figure 3-21: Inserting the SAM into the socket
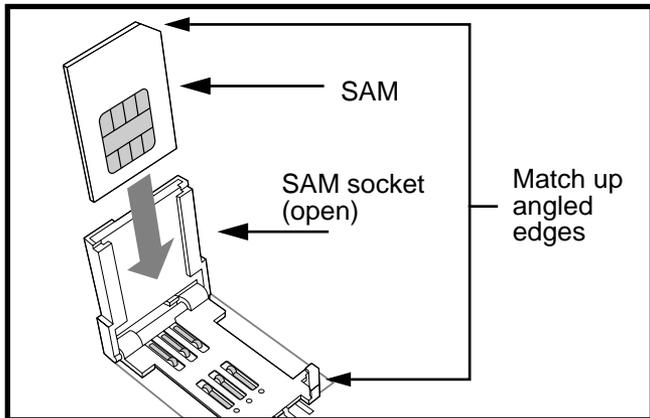
Note: Do not install the SAM unless the e-purse application will be activated.

2. Ensure the power is disconnected and reconnect all the cables.

   • Ensure that the cables are fully seated in their connectors and excess cable is folded and tucked away from the edges of the terminal.

   • **If the terminal has a smart card alert**, the cables from the alerter PCP and the keypad/hookswitch PCP to the smart card alert connectors are routed under the PCP assembly.

See this	**Coin basic portable display installation**
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 following these steps. 1. Ensure that the power is off. 2. Remove the black plastic VFD cover. 3. Position the display on top of the clamp plate, with the cable sitting under the PCP assembly. 4. Connect the display connector to the control PCP as you slide the assembly into the brackets. **Refer to Chapter 4 for detailed installation instructions**

3. Reconnect the upper terminal block to the rear terminal PCP. This connects power to the terminal. Refer to Figure 3-22.

   Note: If the terminal has an IAS module, the power connects to the terminal block on this module.

Figure 3-22: Reconnecting the upper terminal block

Rear housing

ISWs

Rear terminal PCP

Upper terminal block
attached to lower
terminal block

Ribbon cable
connects to
control PCP
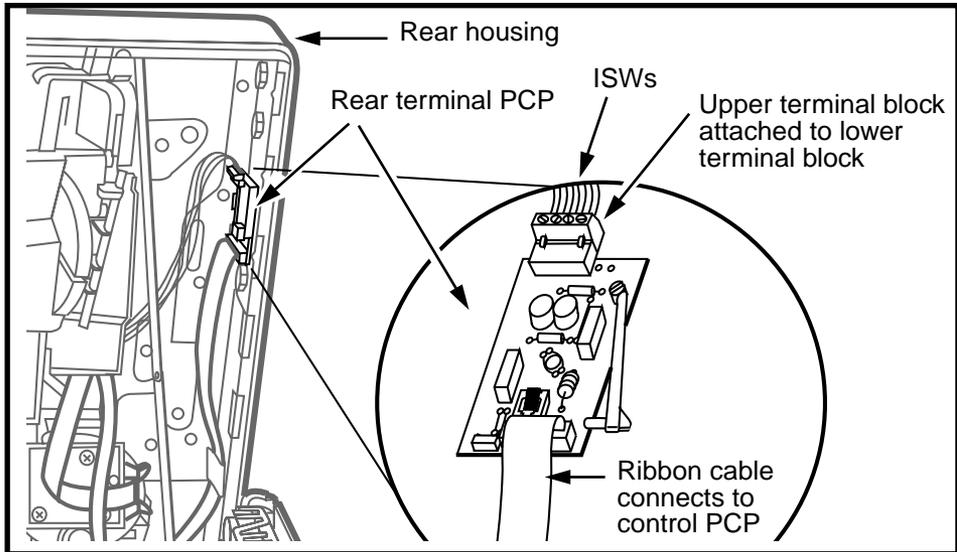
4. If **Telephony board not responding** appears on the display, with the terminal open and the handset on-hook, allow the terminal to power-up for three minutes.

During this time, the terminal will not respond to further install or maintenance instructions.

After this warm-up period, the following prompt will appear:

```
Enter PIN: ■ ■ ■ ■ ■
◆=Fix,✳=Save, #=STOP
```

Error: If **Telephony board not responding** does not go away after the warm up period, the telephony PCP is defective. Replace it and try again.

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

• If you are not going to do the INSTALL at this time, continue with **step 6**.

• If you are ready to do the INSTALL routine, enter your PIN and proceed with the routine.

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

6. Disconnect your ESD strap from the terminal.

7. Close the terminal and put the handset on-hook.

If you have not run the INSTALL routine, after 10 seconds **Out of service** appears on the display. If **Telephony board not responding** is displayed after 10 seconds, replace the telephony PCP.

Installing an external instruction card

Follow these steps to install an **external insrtruction card**:

1. Insert the corners of the card under the lip between the display window and the upper bezel.

2. Slide your fingers along the edges of the card, pressing the edges under the lip.

3. Position the card so that all its edges are covered.

See this:	**Coin basic w/o display terminal**
	Do not install an instruction card until you have performed the INSTALL procedure and removed the portable display.

Figure 3-23: Replacing the external instruction card

Note: **Coin basic w/o display terminal** cards should not have the VFD cutout.
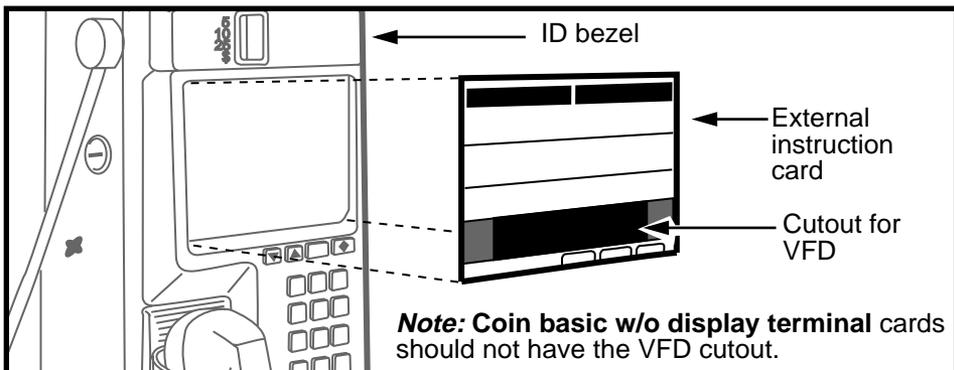
Installing a coin box

If the terminal does not have a **coin box** installed, install one now.

Refer to Figure 3-24 and proceed as follows:

1. Insert the coin vault key into the key slot at the lower right side of the terminal and rotate the key clockwise to unlock the compartment.

2. Insert the T- tool into the slot on the front of the vault door and turn the tool counterclockwise until it stops.

3. Pull the tool and vault door away from the terminal.

4. Insert the coin box, aligning the top with the upper coin rail.

5. Replace and lock the vault door by reversing **steps 1** to **3**.

Figure 3-24: Removing the vault door and coin box
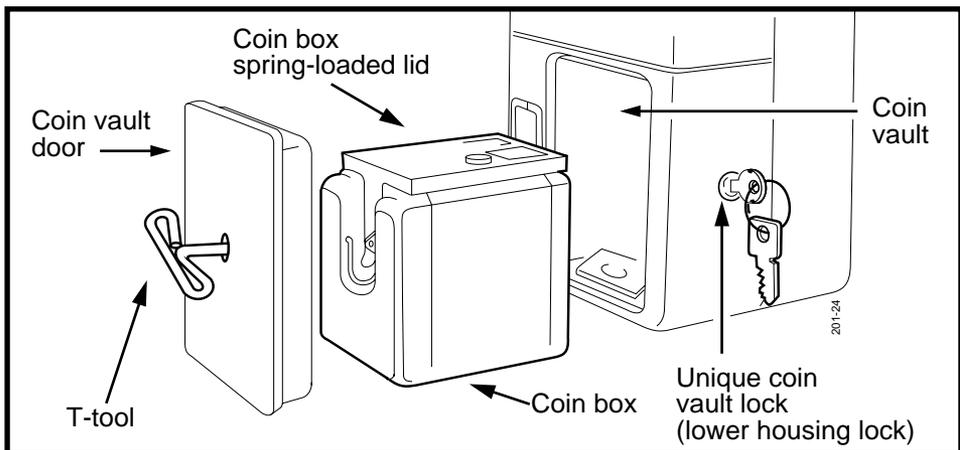
4 Coin basic w/o display

The Coin basic w/o display terminal is the base-line Millennium terminal based on the Multi-pay terminal. It accepts coins and manually-entered calling card numbers as payment methods. Vocal prompts through the handset guide the caller through the call process.

Figure 4-1 shows an exterior view of the **Coin basic w/o display** terminal. Note that the card reader area is covered by a blank bezel and there is no VFD (vacuum fluorescent display) opening in the instruction card.

Figure 4-1: Coin basic w/o display terminal

Figure 4-1: Coin basic w/o display terminal
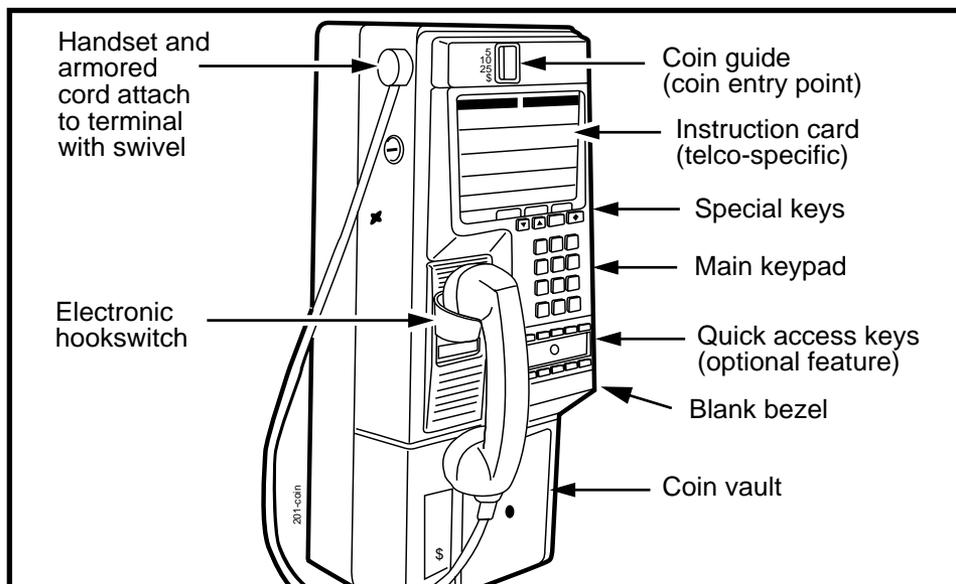
A **Coin basic portable display** must be installed in the Coin basic w/o display terminal to provide the craft interface visual prompts to allow the terminal to be properly installed and maintained.

When the craftsperson is finished the installation or maintenance procedure, the display is removed from the terminal.

Note: Power must always be disconnected when connecting or disconnecting the portable display.

Coin basic w/display terminal: A version of this terminal is also available with a VFD installed. In this case, the only difference from a Multi-pay terminal is that it does not have a card reader.

Installing the Coin basic portable display

This section assumes you are going to perform the INSTALL routine immediately after installing the terminal. In this case, you install the portable display when you reach the section **Installing internal components** in Chapter 2.

See this 	**Installing the display after installation** If the INSTALL routine will be performed at another time, complete the installation as instructed in Chapter 2 without installing the portable display. In this case, to install the portable display, you would have to enter the craft interface and unlock the terminal as described in *Millennium terminals: using the craft interface*

The following steps describe how to install a **Coin basic portable display** during the hardware installation procedure for a Coin basic w/o display terminal.

1. Ensure that your ESD strap is properly connected inside the terminal.

2. Ensure that the power is disconnected.
   The upper terminal block should still be clipped to the link assembly.

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

3. Lift the PCP assembly by the plastic frame.

   Note: You may need to disconnect the keypad cable (J1A) and the handset teladapt plug (J10B) if these cables are not long enough to allow you to lift the PCP assembly sufficiently to reach the display connector.

4. Remove the black plastic window cover from the clamp plate and set aside.

   Note: If there is an internal instruction card, you will not install it until after the software installation.

5. Seat the temporary display, which is encased in a clear plastic housing, over the four screw posts on the clamp plate.
   The edge of the display with the cable connector should be closest to the top of the terminal and be threaded under the PCP assembly.

6. Connect the **Coin basic portable display** cable to the connector on the control PCP (J7).

Rest the PCP assembly on the brackets in the terminal and connect the display cable to the appropriate connector.

7. Reseat the PCP assembly in the brackets.

8. Continue with any other internal procedures, such as installing the quick access keys label or terminal number label.

9. Reconnect any cables you disconnected.

10. **Reconnect the power:** Connect the terminal block to the rear terminal PCP terminal block connector.

11. When the hardware installation is complete, close the housing and lock the terminal with the T-tool in preparation for the INSTALL routine.

    Refer to the craft interface documentation if you do not know how to run the INSTALL procedure.

12. To remove the display, reverse the steps given above.

See this	**Ensure that the power is disconnected before connecting or disconnecting any cables.**

5 Installation flowcharts

This chapter provides quick-view flowcharts showing the installation procedures for a standard **Multi-pay terminal** and for a **Coin basic w/o display** terminal.

Note: These flowcharts highlight the key points to the procedure. For detailed explanations, refer to **Chapter 3** and **Chapter 4**.

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

Figure 5-1: Terminal installation overview
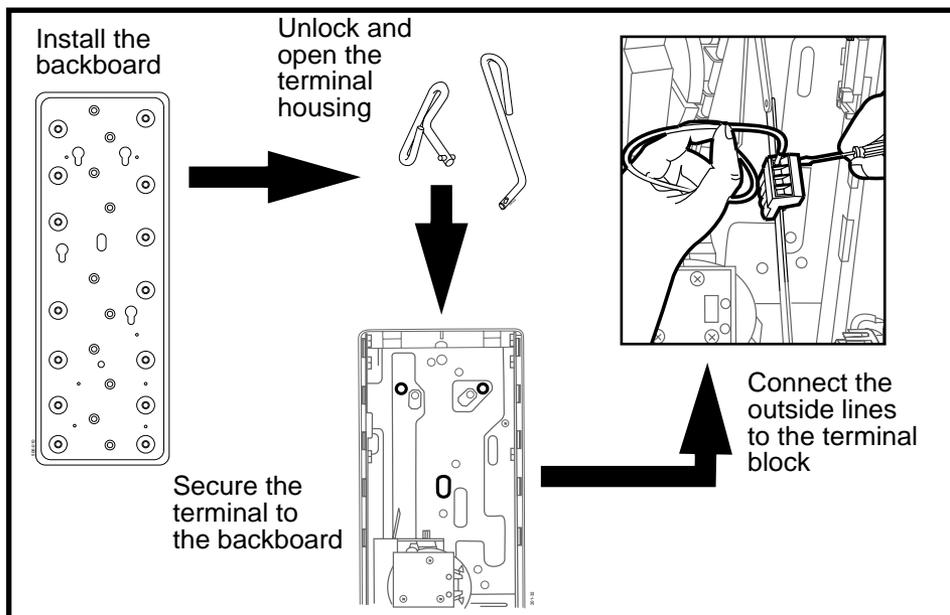
Multi-pay installation flowchart

If you are familiar with Millennium 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 using
your butt set and multimeter

Tape inside service wire (ISW) ends

Is a backboard or adapter kit required?

No

Yes

Install backboard or adapter kit

Insert security studs in back of terminal

Install terminal on backboard
Feed wires through access hole

Unlock and open terminal housing

Connect ESD wrist band inside terminal

Secure terminal to backboard

Connect ISWs to upper terminal block
DO NOT PLUG IN

Is an internal instruction card required?

No

Yes

Install instruction card

Ensure that all cables are properly connected

Connect upper terminal block to connect power

Disconnect ESD strap from terminal

Continued on next page.

NTP: 506-6501-203 Issue: 00.01 Status: Standard Date: June 1998

Continued from previous page.

Close and lock housing
with T-/L-tool.
Display: Out of Service

Is the
coin box
installed?

No

Install coin box
in coin vault

Yes

Perform INSTALL:
Enter access code and PIN

At unlock prompt, unlock
terminal. Do not open housing

Follow prompts to install
terminal

Terminal
installed
correctly?

No

Trouble-
shoot errors
and retry

Yes

Lock housing to complete
INSTALL routine

Install external instruction
card, if required.

Perform function tests.

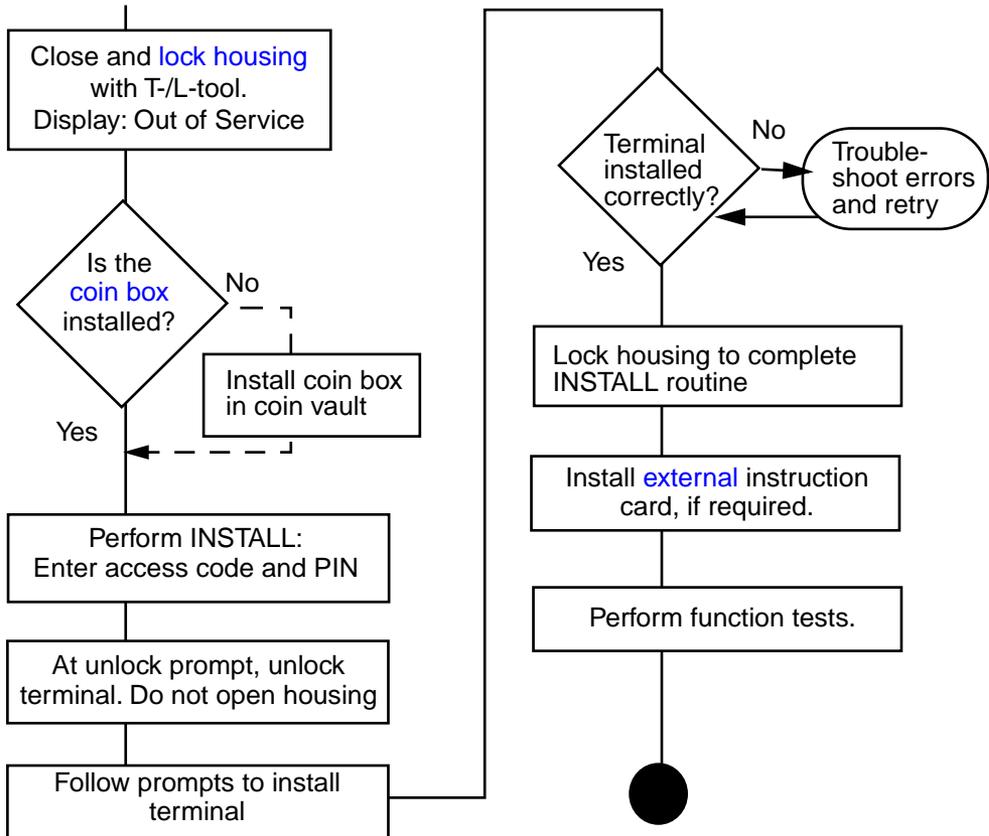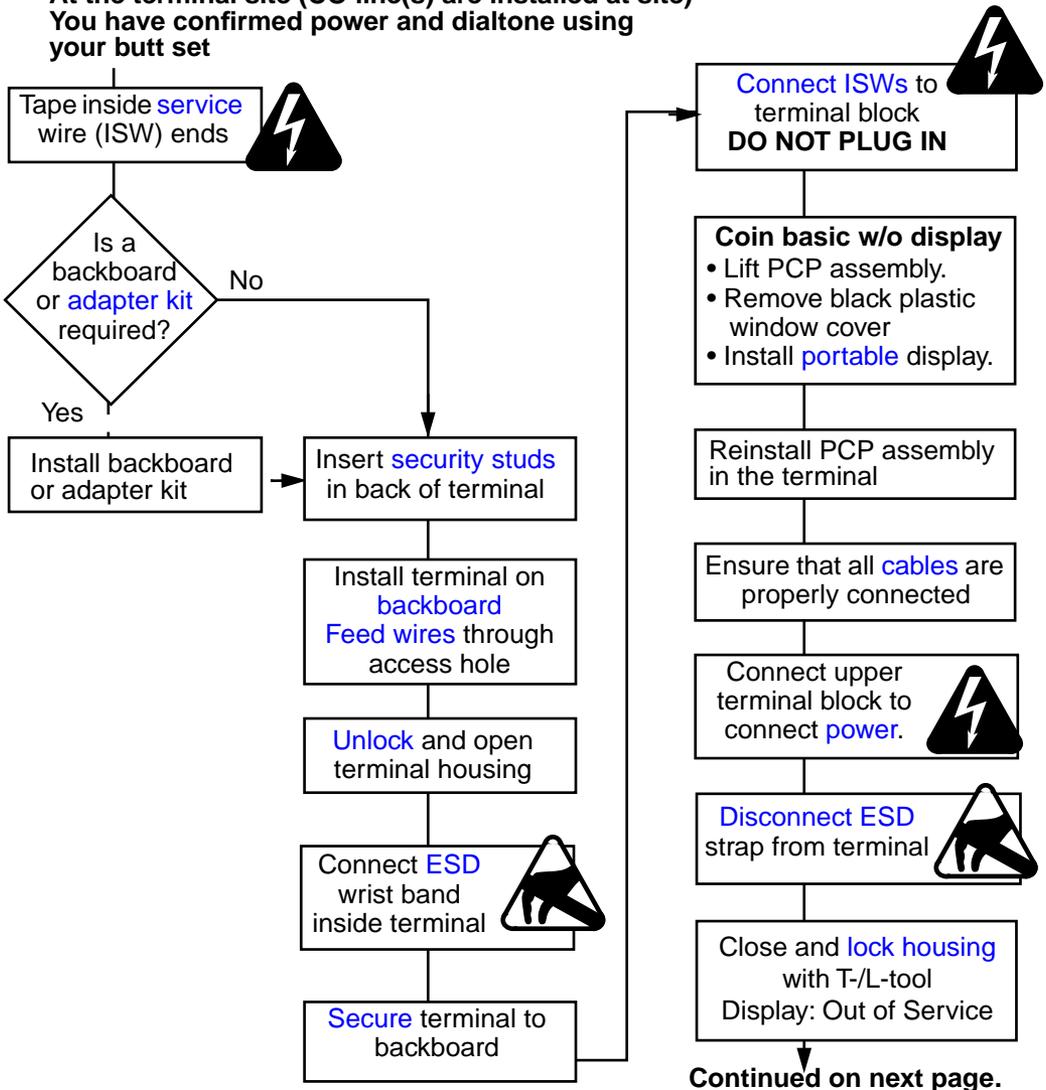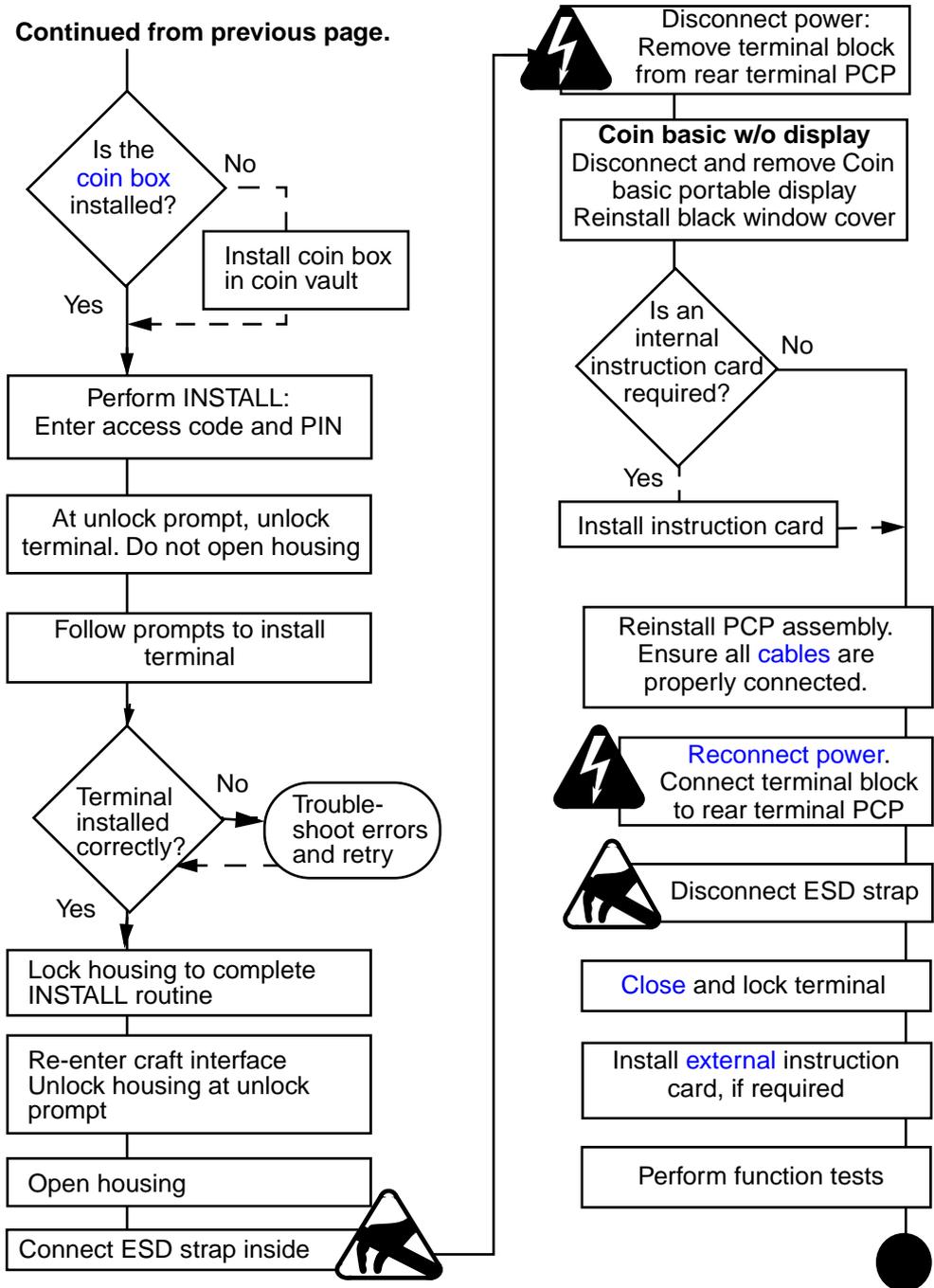# Coin basic w/o display installation

If you are familiar with Millennium terminals, use the flow-chart given below and on the next page as a guide to a typical installation for the **Millennium Coin basic w/o display terminal**.

At the terminal site (CO line(s) are installed at site)
You have confirmed power and dialtone using
your butt set

Tape inside service wire (ISW) ends

Is a backboard or adapter kit required?

No

Yes

Install backboard or adapter kit

Insert security studs in back of terminal

Install terminal on backboard Feed wires through access hole

Unlock and open terminal housing

Connect ESD wrist band inside terminal

Secure terminal to backboard

Connect ISWs to terminal block **DO NOT PLUG IN**

Coin basic w/o display
• Lift PCP assembly.
• Remove black plastic window cover
• Install portable display.

Reinstall PCP assembly in the terminal

Ensure that all cables are properly connected

Connect upper terminal block to connect power.

Disconnect ESD strap from terminal

Close and lock housing with T-/L-tool Display: Out of Service

Continued on next page.

Continued from previous page.

Is the coin box installed?

No

Install coin box in coin vault

Yes

Perform INSTALL: Enter access code and PIN

At unlock prompt, unlock terminal. Do not open housing

Follow prompts to install terminal

Terminal installed correctly?

No

Trouble-shoot errors and retry

Yes

Lock housing to complete INSTALL routine

Re-enter craft interface Unlock housing at unlock prompt

Open housing

Connect ESD strap inside

Disconnect power: Remove terminal block from rear terminal PCP

Coin basic w/o display Disconnect and remove Coin basic portable display Reinstall black window cover

Is an internal instruction card required?

No

Yes

Install instruction card

Reinstall PCP assembly. Ensure all cables are properly connected.

Reconnect power. Connect terminal block to rear terminal PCP

Disconnect ESD strap

Close and lock terminal

Install external instruction card, if required

Perform function tests

Millennium Multi-pay-based terminals: installing terminal hardware

Appendix A: Regulatory notices

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 com-

pliance 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. Specifically, use only 4 conductor modular teladapt plug/cords with this product, and 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 B 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

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. Specifically, use only four-conductor modular teladapt plug/cords with this product. 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 routine quick reference

Step	Display	Action
1.	`*  out of service  *`	With the handset is on-hook, enter the default access code.
2.	`Enter PIN: ■ ■ ■ ■ ■` `◆=Fix,✳=Save, #=STOP`	Enter five-digit personal identification number (PIN) code.
3.	`Please use key now` `& open the terminal`	Unlock and open the terminal

4.	*Uninstalled terminal*
	`Not installed`
	`Use # to INSTALL`
	
	Installed terminal
	`Use ✳=MENU, #=INSTALL`
	`or dial item number`
		Press #.

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

Step	Display	Action
5.	`CO line check` `Go offhook`	Lift the handset off-hook.
	`Checking CO` `connection`	
6.	`Completed      00` `To continue, press  ✳`	Press ✳.
7.	`Go back onhook`	Place the handset on-hook.
8.	■■■ – ■■■ – ■■■■ `Enter line tel. num.`	Enter the telephone number of the terminal.
9.	■■■ – ■■■ – ■■■■ `Use ◆=FIX,  ✳=SAVE`	Press ✳.
10.	■■■■■■■■■■ `Enter serial number`	Enter the ten-digit serial number of the terminal.
11.	■■■■■■■■■■ `Use ◆=FIX,  ✳=SAVE`	Press ✳.
12.	■■■■■■■■■■ `Enter NCC tel. number`	Enter the telephone number of the Millennium Manager.
13.	■■■■■■■■■■ `Use ◆=FIX,  ✳=SAVE`	Press ✳.
14.	`Answer detect check` `Go offhook`	Lift the handset off-hook
	`Checking answer` `detection`	
15.	`Completed:      00` `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 routine quick reference (continued)

Step	Display	Action
	`Download in progress` `*    Please wait    *`	
18.	`Completed:      0X` `To continue, press ✳`	Press ✳.
19.	`Go offhook, press all` `buttons, then onhook`	Lift the handset off-hook.
20.	`(keypad character)` `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   *` ` your card`	Remove the card.
24.	`(card mag stripe #)` `To continue, press ✳`	Press ✳
25.	`Deposit a` `calibration coin`	Deposit calibration coin number one.
26.	`Deposit a` `calibration coin`	Deposit calibration coin number two.
27.	`Deposit a coin` `to test escrow unit`	Deposit calibration coin number three.
28.	`Completed:      00` `To continue, press ✳`	Press ✳.
29.	`Install is complete` `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
 	
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.
	
	• If the problem is outside the terminal, you will get a continuous busy signal and `modem busy` will be displayed everytime the you try to download.
	
	  Contact the system administrator to query the status of the modem.
	
	• If the problem is inside the terminal, there will be no signal.
	
	  Replace the control PCP

24: Data transmission problem 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 is displayed.	Error 24 can occur at three different points in the download process: • immediately as it is initiated, before the `Please wait` message appears — the data call was not started, retry the download • 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 • a couple of minutes into the transmission — the terminal connected, but the line failed; retry the download

Error	Troubleshooting
26: No ringback signal 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. To troubleshoot error 26: 1. Use your test handset to test the CO line at the rear terminal pack. 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 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. 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 Two error codes can be generated: • 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. • Error Code 42 — The terminal does not detect dialtone from the CO line.	Refer to the troubleshooting documentation for suggestions about troubleshooting: • *Millennium terminals: maintenance troubleshooting* • *Millennium terminals: pocket troubleshooting guide.*

Error	Troubleshooting

51: Failed supervision test
 	
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.
	
	• 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.
	
	• If the problem is inside the terminal the polarity light will change, i.e. the polarity reverses.
	
	  You may need to replace the handset, telephony PCP or the control PCP.
	
	• If the problem is outside the terminal then the polarity does not change.
	
	  Call dispatch to confirm that the line has been properly configured for local line side answer supervision.
	
	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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Millennium Multi-pay-based terminals:
Installing terminal hardware

N⊘RTEL
NORTHERN TELECOM