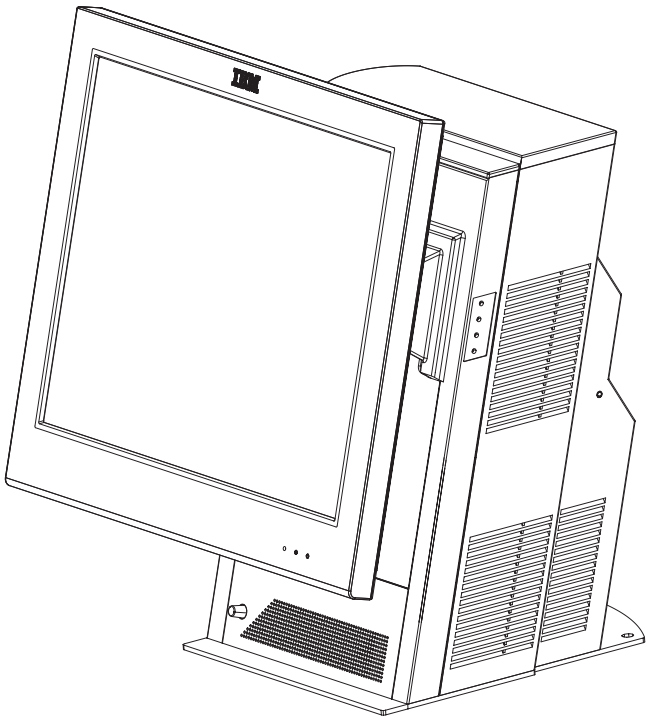
SurePOS 500 Series

Planning, Installation, Operations, and Hardware Service Guide for Models 526, 566, and E2S



G362-0568-00

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August 2009

This edition applies to the IBM® SurePOS Machine Type 4852 and 4961, Models 526, 566, and E2S and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this guide

This guide provides information necessary to repair and maintain the IBM SurePOS® 500 Series Machine Type 4852, Models 526, 566 and 4961–E2S.

Notices contained in this guide are defined as follows:

Notes These notices provide important tips, guidance, or advice.

Important
These notices provide information or advice that might help you avoid inconvenient or problem situations.

Attention
These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

Caution
These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

Danger
These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Who should read this guide

This guide is for end users, planners, installers, and the IBM service representative to assist in maintaining and repairing the IBM SurePOS 500 Series Models 526, 566, and E2S.

Related publications

The SurePOS 500 Series library consists of the following publications:

- *IBM SurePOS 500 Series Operating System Installation Guide for Models 526, 566, and E2S*, G362–0569

  This guide provides step-by-step information on installing the operating software for the product.
- *IBM Point of Sale Options and I/O Devices Service Guide*, GC30-9737

  This guide describes the problem-determination and repair procedures for cash drawers, displays, keyboards, and options that are attached to IBM® SurePOS™ systems.
- *IBM Safety Information — Read This First*, GA27-4004

  This document contains important safety information.

To access these publications:

1. Go to: www.ibm.com/solutions/retail/store/.
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Publications accessibility

The softcopy version of this guide and other related publications are accessibility enabled.

Web sites

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Chapter 1. Introducing the IBM SurePOS 500 Series Models 526, 566, and E2S

The IBM SurePOS 500 Models 4852–526, 4852–566, and 4961–E2S will enable you to provide fast, accurate customer service and to manage your restaurant or store efficiently. You can configure the SurePOS 500 Series systems to support a wide variety of both IBM and non-IBM input/output (I/O) devices – everything from standard serial-attached devices to Universal Serial Bus (USB)-attached devices.

System resources and the operating system may limit the use of ports. Figure 1 shows a sample SurePOS 500 configuration.

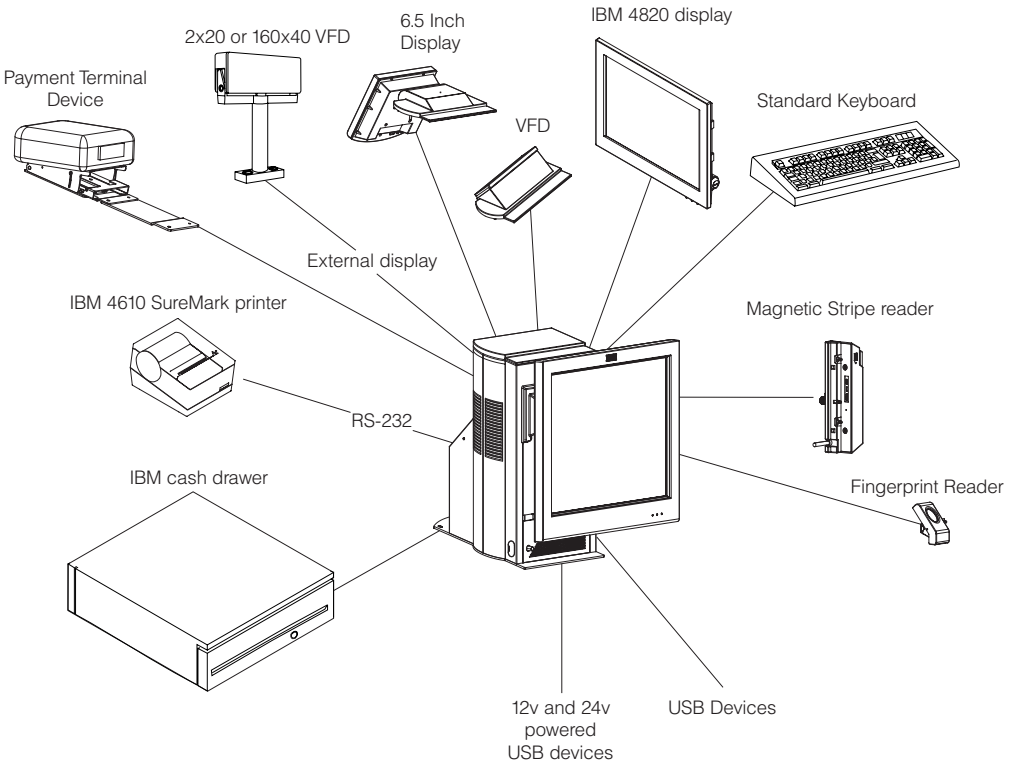


Figure 1. IBM SurePOS 500 Series configuration with optional features. Note: The location of the peripherals in this diagram is not an indication of the actual connector location.

Models and features

Table 1 on page 2 and Table 2 on page 3 summarizes the SurePOS 500 models and features.

Table 1. 4852 Entry and Premium Models summary

Attribute	Entry Model and 4961–E2S	Premium Model
Processor and FSB speed	Intel Celeron M 373 1.0 Ghz, FANLESS	Dual Core Celeron E1500 Conroe
Processor Socket	Not Pluggable - soldered only	Intel LGA775 socket
Chipset	Intel 910GMLE /ICH6M	Intel Q35/ICH9
BIOS	Award	Award
Main memory	DDR2 400 Mhz **Memory DIMM Sizes:** • 512 MB • 1 GB **Maximum Total (two slots): 2 GB**	DDR2 667/800 Mhz **Memory DIMM Sizes:** • 1 GB • 2 GB **Maximum Total (two slots): 4 GB**
Video	Intel ″Integrated Graphics Device″ with integrated Dual Independent output (Analog RGB and DVO digital output)	Intel ″Integrated Graphics Device″ with integrated Dual Independent output (Analog RGB and DVO digital output)
Video Memory	Up to 128 MB via Intel DVMT driver 1 MB or 8 MB pre-allocated for non DVMT systems (DOS)	Up to 256 MB via Intel DVMT driver 1 MB or 8 MB pre-allocated memory for non DVMT systems (DOS)
LCD	15″ High Bright	15″ High Bright
Touch Sensor	5-wire Resistive Touch technology	Infrared Touch Technology Inadvertent Touch circuit - vibration sensing
Audio	Not available	Headphone and Mic ports Integrated Stereo Speaker
Mass storage	Size: 160 GB SATA 1.5 Gb/s	Size: 160 GB SATA 1.5 3.0 Gb/s
LAN	• 10/100 MB • 802.11 wireless LAN is supported via USB Dongle, customer provided	• 10/100Mb/1000MB • 802.11 wireless LAN is supported via USB Dongle, customer provided • Or by ExpressCard Slot
Expansion	Not available	Single ExpressCard 34/54mm Slot
I/O ports and connectors	(1x) 15 pin VGA (1x) 12V powered USB (1X) 24V powered USB (5X) Standard USB (1X) Powered RS232 (3X) Standard RS232 (2X) Cash drawer ports PS/2 Keyboard PS/2 mouse	(1x) 15 pin VGA (1x) 12V powered USB (1X) 24V powered USB (7X) Standard USB (1X) Powered RS232 (3X) Standard RS232 (2X) Cash drawer ports PS/2 Keyboard PS/2 mouse Headphone Microphone
Integrated I/O devices - Tablet	• Fingerprint Reader (not supported in PCDOS) • Magnetic Stripe Reader (MSR)	

Table 1. 4852 Entry and Premium Models summary (continued)

Attribute	Entry Model and 4961–E2S	Premium Model
Integrated I/O devices - Tower	• 2x20 serial VFD (optional) • 6.5" customer display (optional)	• 2X20 VFD (optional) • Stereo speakers • 6.5" Customer display (optional)
Indicators	Power (tablet) HDD activity (tablet) Hardware failure (tablet) Ethernet (tailgate) Light Path LEDs (tower), Premium Models Only - See Figure 6 on page 16 for the status indicator states	
Controls	Power LCD brightness Volume (Premium Model only)	

Table 2. Entry and Premium Models

Model Number	Description
4852–526	Entry System unit Model 526
4852-E26	Entry System unit Model 526 preloaded with Microsoft OS selected by Feature Code
4961–E2S	Entry System unit Model 526 preloaded with POSReady and 4610 Printer
4852–566	Premium System unit Model 566
4852–E66	Premium System unit Model 566 preloaded with Microsoft OS selected by Feature Code

Optional features

The following is a list of optional features available for the SurePOS 500:

- 4 GB modular flash drive
- Memory:
  - 512 MB DDR2, Entry Models Only
  - 1 GB DDR2
  - 2 GB DDR2,

    (Entry Models - 2 x 1 GB DIMM
    Premium Models - 1 x 2 GB DIMM)
  - 4 GB DDR2, (2 x 2 GB DIMM), Premium Models Only
- Displays:
  - Integrated 2x20
  - Distributed 2x20
  - Distributed APA
  - 6.5–in. LCD graphics
- MSR:
  - 3-track
  - JUCC
- Keyboard, compact ANPOS
- Fingerprint Reader
- USB Wireless Dongle Cover
- Extended PC Express Card Cover (Premium Model)
- Standard CD Integration Tray (4610/keyboard)
- Cash drawer (standard, compact)
- 4820 Attachment Kit
- Payment Terminal Mounting Kit

Connectors, power, and brightness controls

Figure 2 and Table 3 identify the controls and tablet connectors.

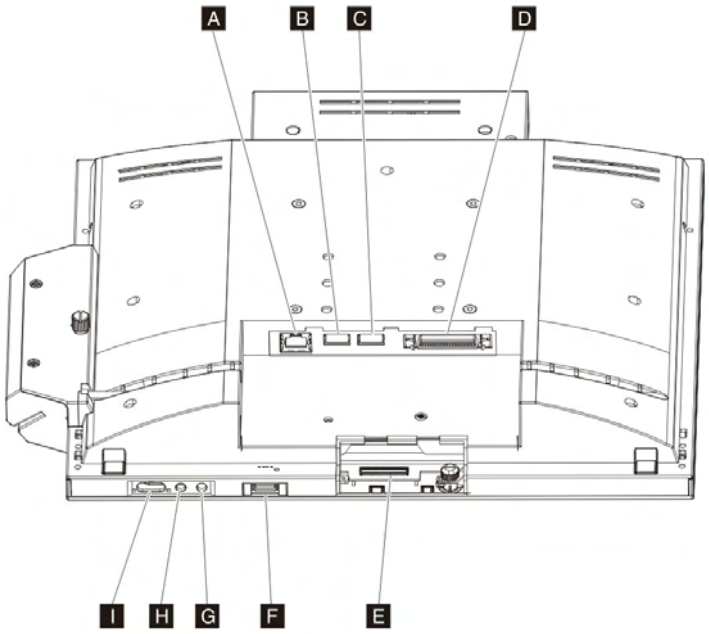


Figure 2. Tablet connectors

Table 3. Controls and connectors

Reference	Description
A	MSR port
B C F	USB connectors
D	Tablet cable connector
E	Touch cable connector (located behind door)
G H	LCD brightness controls (minus – and plus +)
I	Power button

Figure 3 and Table 4 on page 7 identify the rear connectors.

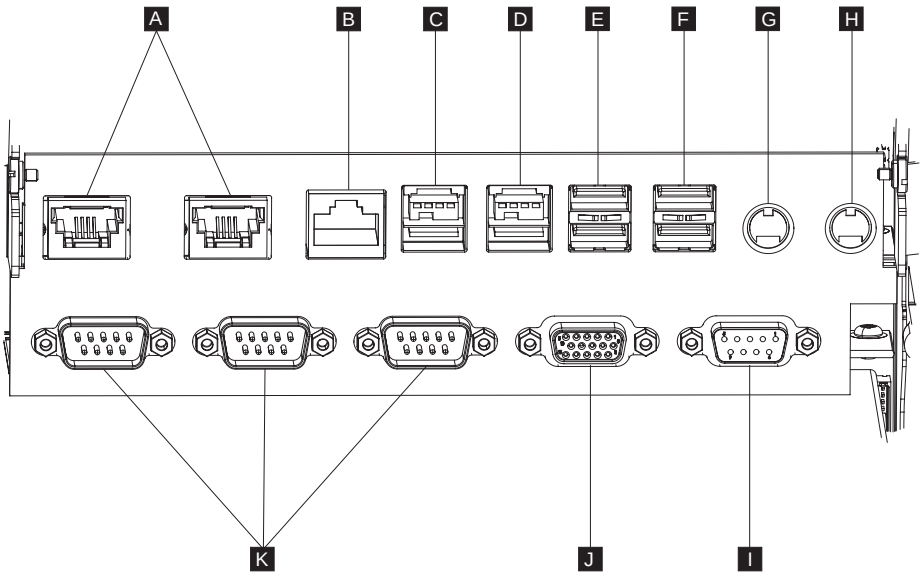


Figure 3. Rear view of input/output connectors

Table 4. Rear connectors

Reference	Description	Icon
A	Cash drawer connectors (2 each rated 24 V, 1.0 A 200 ms pulse)	3A, 3B
B	Ethernet	
C	Powered 24V rated for 3A continuous	
D	Powered 12V	
E	USB 2.0 ports	
F **Note:** Premium Models Only	USB 2.0 ports	
G	Keyboard	
H	Mouse	
I	12V serial	
K	Serial ports (3), non-powered	
J	VGA	

Supported operating systems

Table 5 describes the operating systems support.

Table 5. SurePOS 500 Models 526, 566, and E2S supported operating systems

Operating System
PC DOS 2000
Windows XP
WEPOS
POSReady
SLEPOS 11

Notes:

1. Full Screen DOS sessions are not supported. However, windowed DOS mode is fully supported. A touch to a full-screen DOS session will cause your system to immediately return to your Windows desktop. A mouse can be used to access programs run in a Full Screen DOS session.
2. Windows DBCS (double byte) versions are supported.
3. Performance for OS's loaded on the Solid State file (modular flash drive) could be reduced.
4. The standby and hibernation modes are not supported with WEPOS.

POS application drivers may be more restrictive on operating system support. Refer to the OPOS/JavaPOS specifications for supported operating systems.

Understanding the display and operating system restrictions

The operating system, the display size, and any attached CRTs can affect the display resolution. The following definitions describe the terms and various display configurations:

Single A type of display configuration that supports only one display device.

Twin A type of display configuration that supports two display devices, each of which has the same content, resolution, and timings. Also referred to as Simultaneous mode.

Clone A type of display configuration that drives two display devices, each displaying the same content, but can have different resolutions and (independent) timings.

Dual Independent Head (DIH)
A type of display configuration that supports two displays with different content on each display device. Also referred to as an Extended Desktop.

The integrated LCD/Touch display supports the following modes when using the indicated operating system:

- Windows XP: Clone (default), twin
- WEPOS: Clone (default), twin

The integrated LCD and a second display attached to the 15-pin VGA port:

- Windows XP: Clone (default), twin, DIH
- WEPOS: Clone (default), twin, DIH

Table 6 on page 9 summarizes the restrictions, if any, imposed by the operating system.

Table 6. Operating system with display combinations and restrictions

Display		**DOS**	**Windows**
Integrated LCD only	Image	Single[1]	Single
	Restrictions	None	
Integrated LCD + External Display	Image	Single, on board LCD	Dual-independent[2]
	Restrictions	None	Onboard LCD becomes secondary display when installing Windows
General	Restrictions	Touch on primary display only	None

1. Dual-same: same data on both displays; simultaneous mode
2. Dual-independent; different/independent data on both displays; extended desktop

Table 7. Supported video resolutions in Windows operating system

LCD size	**Available video resolutions for onboard LCD**
15 in.	800 x 600 1024 x 768
6.5 in.	640 x 480

System management

This section describes the types of system management available with the SurePOS 500.

System management programs

The SurePOS 500 Series supports the following system and power management programs:

Desktop Management Interface
The SurePOS 500 Series supports System Management BIOS (SMBIOS) v2.4, supporting a DMI-compliant agent such as Tivoli®. This allows access to low-level information. Examples of information that can be accessed are the BIOS level, processor type, speed, manufacturer, system-board information, and detailed memory information.

RDM (Remote Deployment Manager) and IBM Director
RDM can install an OS and update BIOS remotely and probe machines for low-level information. IBM Director can remotely configure applications and operating systems, transfer files, and inventory workstations on a network.

APM APM consists of several layers of software that allow the operating system, applications, and BIOS to work together to reduce power consumption. APM is supported on DOS and Linux platforms.

Advanced Configuration and Power Interface
Advanced Configuration and Power Interface (ACPI) V1.0 defines a hardware and software interface and tables by which the operating system can alter the characteristics of the hardware-specific devices. ACPI is supported on Windows XP, WEPOS, and POSReady.

Power up on LAN
This feature enables the system to power on when it receives a specific frame over the local area network (LAN) through the ethernet feature. You can enable power up (wake) on LAN by enabling **Wake on LAN** in the CMOS Setup Utility program.

Power up (wake) on daily alarm
This feature enables the system to turn on at the same time every day. You can enable power up (wake) on daily alarm by enabling **Wake on Alarm** in the CMOS Setup Utility program.

RMA (Remote Management Agent)
IBM Remote Management Agent is a component of IBM Store Integration Framework that simplifies the delivery of new consumer-facing devices in stores to support the delivery of superior service. For more information, see the Retail Store Solutions web site.

Remote management

The SurePOS 500 Models 526, 566, and E2S supports remote system management over the network. The following functions are supported:

- Selectable startup sequence
- Update POST/BIOS from the network
- Ethernet
- Power up (wake) on LAN

Locating the machine serial number

The serial number and model number (**A**) are located on the front of the system unit.

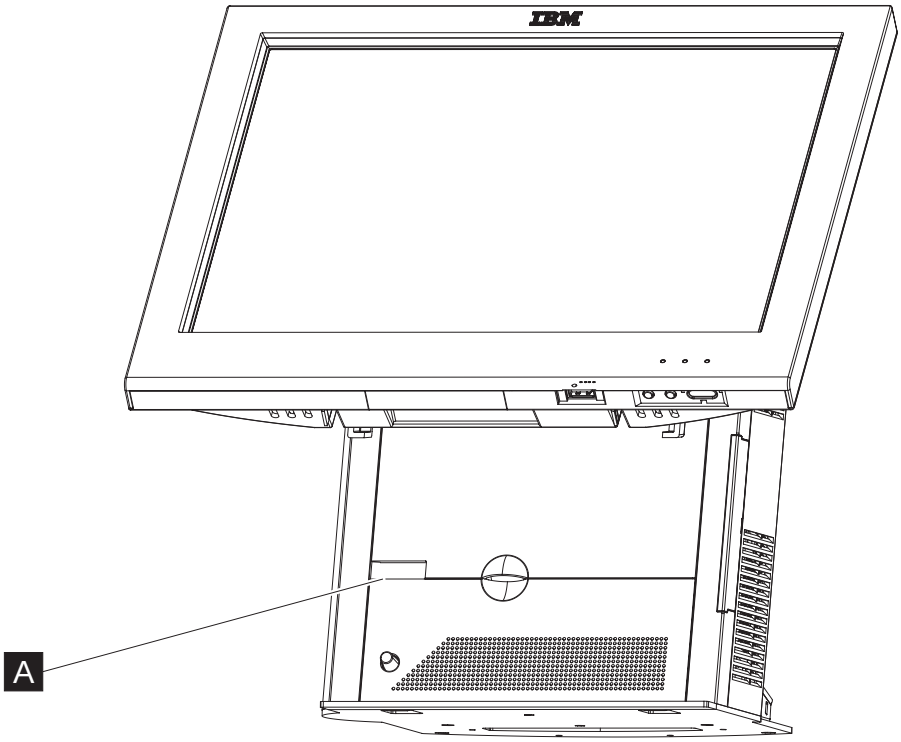


Figure 4. Serial number location

Chapter 2. Installation requirements and overview

This section reviews the software requirements and installation steps for the SurePOS 500 Models 526, 566, and E2S.

Before you begin

Read this information before you begin your installation.

Determining your configuration

You can set up your system units in either an integrated or distributed configuration. An *integrated* configuration is one in which all parts of a system are assembled in one location. A *distributed* configuration is one in which you set up parts of the system in different physical locations.

Your order and packaging

Each order includes the following components:

- System unit
- LAN patch cable; 4.2 m (14 ft), Category 5 (Entry Models), Category 6 (Premium Models)
- Country-specific power cord
- Factory install options, such as direct-access storage devices (DASDs), extra memory
- Safety manual
- Warranty sheet
- Customer-installed options
- Environmental CD

Note: All publications are also available from the Web site at http://www2.clearlake.ibm.com/store/support/html/pubs.html

Installation steps

To install the SurePOS 500, follow these steps.

1. Unpack your product and review the packing slip to ensure that it is correct.
2. Install your options. See Chapter 5, “Installation and replacement procedures for the SurePOS 500 Series Models 526, 566, and E2S,” on page 29
3. Mount your SurePOS 500. See Chapter 6, “Mounting the SurePOS 500 Models 526, 566, and E2S,” on page 93.
4. Attach your input/output devices. See “Installing additional peripheral devices” on page 110.
5. Connect the power, run the CMOS Setup Utility and, if necessary, run the diagnostics. See “Using the CMOS Setup Utility” on page 19 and “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21

Power and system indicators

See Figure 5 to locate the power switch (**A**) and status indicators (**B**). After you complete your installation, follow these steps to ensure your system is operating correctly.

SurePOS 500 Entry models have two status lights on the front of the system. From left to right, the first indicates the hard drive is operating and the second indicates that the unit has power.

SurePOS 500 Premium models have three status lights on the front of the system. From left to right, the first when illuminated indicates a hardware failure, the second indicates hard drive activity, and the third indicates that the unit has power. If the hardware failure LED is illuminated check the light path LEDs located on the right hand side of the tower (See **A** Figure 6 on page 16) for more information about the failure.

1. Connect the power cable to an electrical outlet.
2. See **A** Figure 5 and switch on the power to the SurePOS 500.

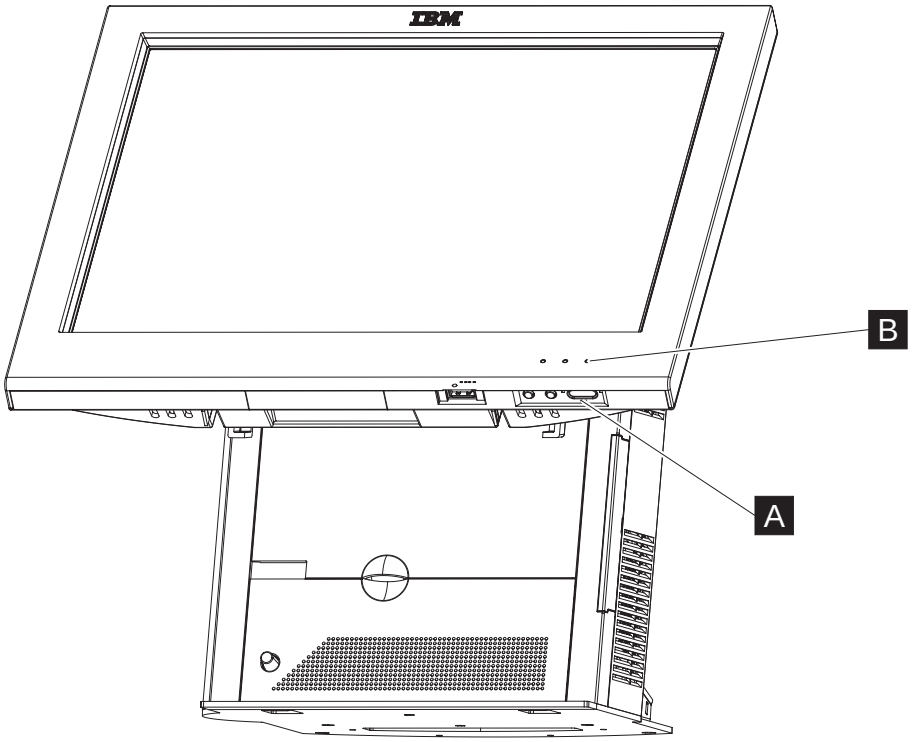


Figure 5. Location of power switch

3. Select the plus + or minus – buttons to adjust the screen brightness.
4. Verify that the system is operating correctly by checking the power LED on the front of the system and making sure it is not off or blinking .

Power LED behavior

There are four possible states for the power LED:

- Off - indicates that the system is unplugged or the power supply is faulty
- On - power is on
- Blinking slow - system is off, but is plugged into an AC power source
- Blinking rapidly - system is in standby

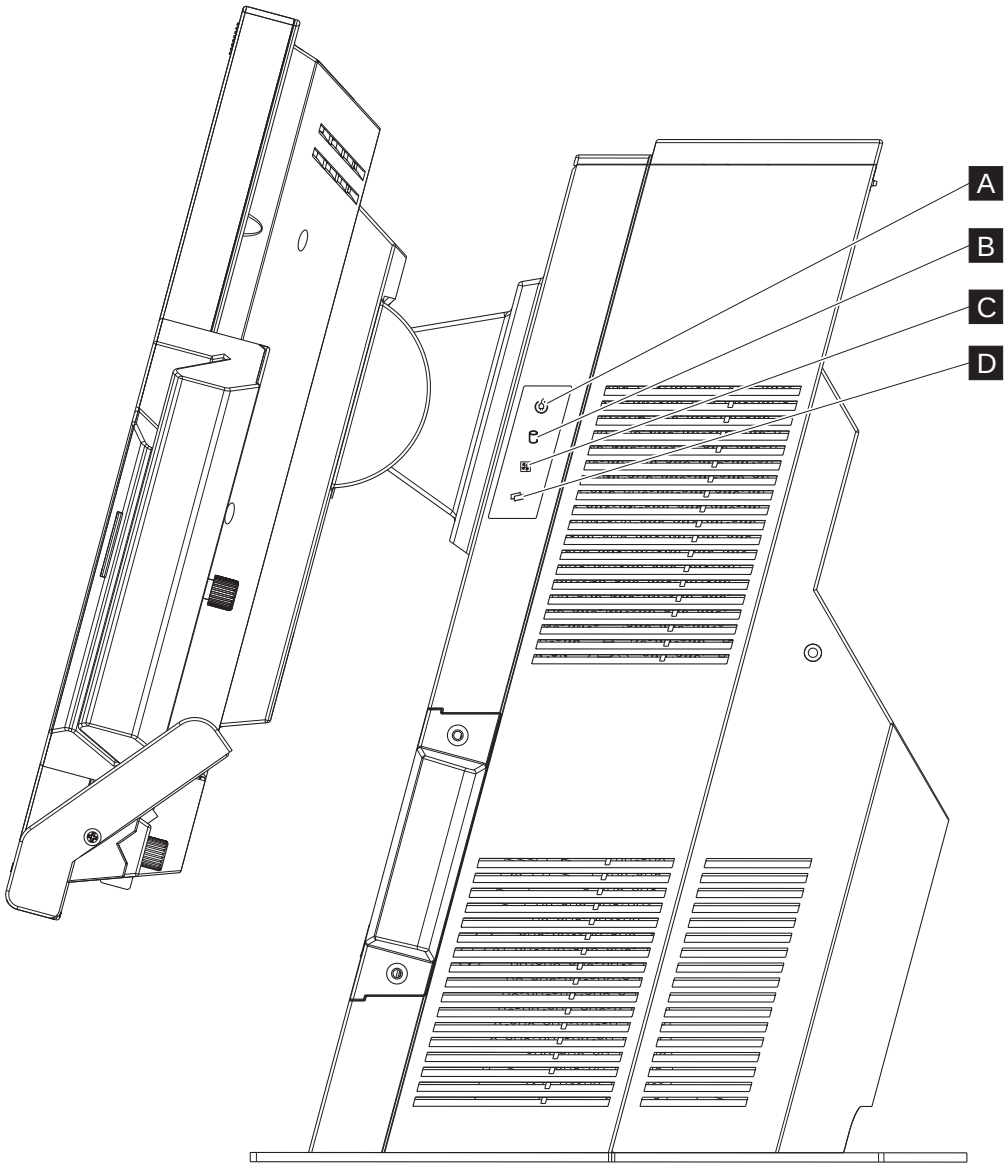


Figure 6. Light Path LEDs (Premium Models)

A	Power supply
B	Hard drive
C	Processor fan
D	Memory

Chapter 3. Operating and maintaining the system

This chapter explains how to operate and maintain the SurePOS 500 Models 526, 566, and E2S.

Using the operator display

Before you begin using the display, follow these tips to ensure that you are comfortable:

- Keep your head in a comfortable viewing position.
- Maintain a comfortable viewing distance.
- Position the display to avoid glare or reflection from overhead lighting or outside sources of light.

  Note: When tilting the display, do not attempt to force it in either direction after reaching the end of its movement range.
- Keep the screen clean from dust and dirt by regularly performing the steps at “Cleaning the screen”
- Adjust the brightness level so that you can see clearly.

Using the brightness control

Pressing the pair of buttons (− or +) at the lower right corner of the display adjusts the display brightness down or up.

Cleaning the screen

Keeping the screen free from dirt and dust enables the screen to operate effectively. Follow these guidelines:

- Use a soft, damp cloth with water, isopropyl alcohol or any non-abrasive and non ammonia-based cleaner and non chlorine-based cleaner. Do not apply cleaning solution directly to the screen. Always spray the cleaner on a clean cloth and then wipe the screen.
- Wipe gently across the surface.
- Allow the surface to dry before using.

Chapter 4. Testing the system

This chapter contains testing procedures for the SurePOS 500 Models 526, 566, and E2S that you can use if you experience a problem after installing the system.

A problem with the system can be caused by a software error or a hardware failure. The following topics contain problem-analysis instructions to help you determine the cause of a problem and resolve it.

Preliminary checklist

The SurePOS 500 Models 526, 566, and E2S performs a Power On Self Test (POST) when you power on. The system indicates a successful POST when the status/power LED stops blinking. If an error message is displayed, perform the following steps to diagnose the problem.

1. Ensure that ac power is connected and observe the power light to make sure it is lit.
2. Ensure that all cables and I/O devices are connected correctly and securely.
3. Make sure that the brightness setting on the operator display is adjusted correctly, using the control at the bottom right side of the display. See “Power and system indicators” on page 15 for details.
4. Record any error messages or symptoms for future reference or when calling for service.

Notes:

1. For internal options and peripheral devices, use the diagnostic service program to help resolve problems.
2. Some devices that attach to the system have test instructions. Refer to those instructions when testing those devices.
3. When using application software, you may receive error messages that pertain to the software. Refer to the software manual for a description of those messages.

Using the CMOS Setup Utility

Follow these steps to start the CMOS Setup Utility:

1. Switch the power ON.

2. Press **Del** during POST when prompted, or **tap the touch display two times**. Use the keys listed in the legend bar at the bottom of the screen to make your selections or exit from the current menu. The help window on the right side of each menu displays the online help information for the currently selected item.

Please refer to the IBM SurePOS 500 BIOS Software Configuration Guide for details on the configuration options in the BIOS Setup Configuration Utility. That information can be found at the following web address: http://www2.clearlake.ibm.com/store/support/html/surepos500.html

Clearing the CMOS settings

The SurePOS 500 uses battery-backed CMOS memory to store system settings. If the CMOS memory becomes corrupted and the system does not boot, you can restore the factory default values by following these steps:

1. Power off the system and disconnect the AC power.
2. Locate the CMOS reset jumper (J25) on the system board. See **A** in Figure 7.

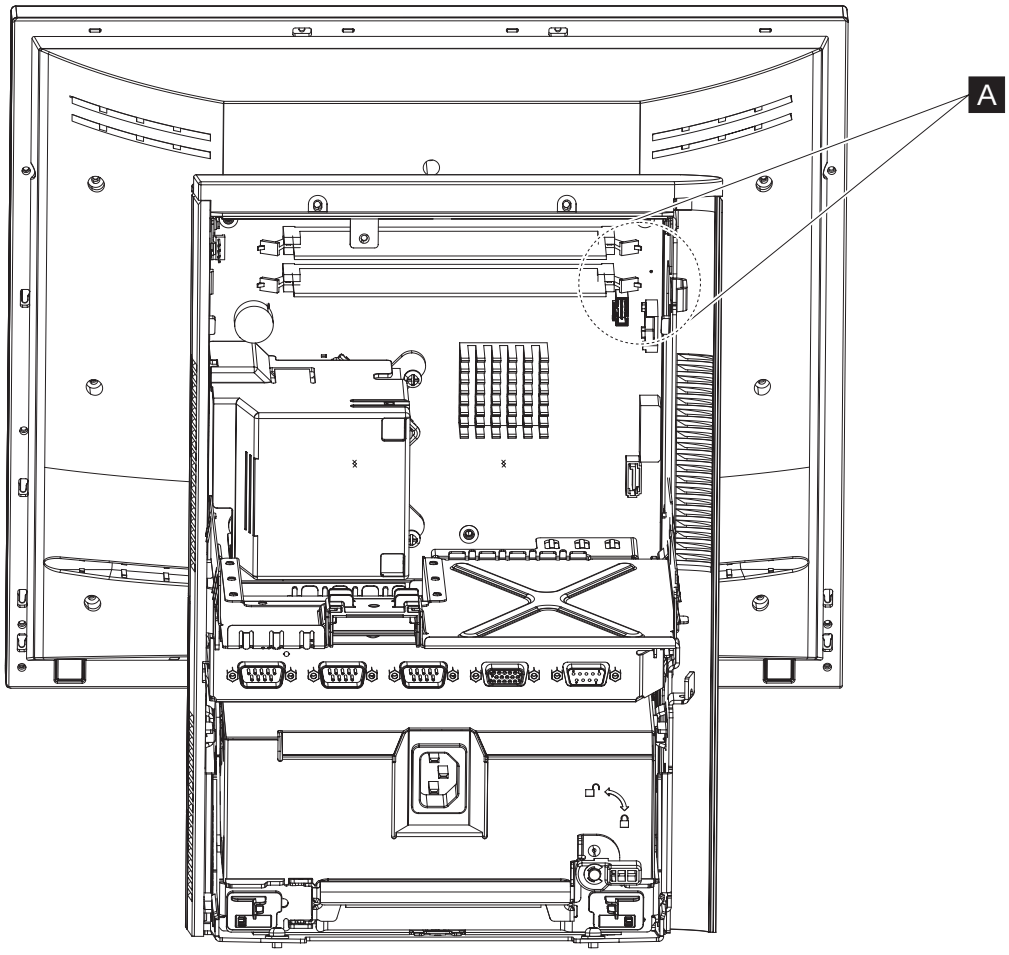


Figure 7. CMOS reset jumper J25

3. Remove the jumper, which is normally located on pins 1 and 2. (Pin 1 is located near the edge of the board, while pin 3 is closest to the memory sockets.)
4. Place the jumper on pins 2 and 3 and wait for 5 seconds. This resets the CMOS.

5. Return the jumper to pins 1 and 2.

   Table 8 describes the system board jumper setting. All jumper pins have the pin number printed on the system board for easy identification.

Table 8. System board jumper settings

Jumper	Default pin location:	Description
J25	pins 1 and 2	CMOS Memory clear: To clear the CMOS, momentarily place the jumper on pins 2 and 3

6. Power ON the system.
7. When you restart the system after resetting the CMOS, the following error message is displayed:

   ```
   CMOS checksum error - defaults loaded
   ```

   To correct these errors, run the Setup Utility and select **Load Optimized Defaults**. This restores the CMOS defaults. After the defaults are restored, check the date and time, and set any other customer-specific settings that were modified before the CMOS was reset.

Real-time clock and CMOS

The real-time clock is a low-power clock that provides a time-of-day clock and a calendar. The clock settings are maintained by the battery when the power cord is removed. Use the CMOS Setup Utility to set the clock and calendar.

See “System-board battery” on page 50 for the location of the battery.

Configuring the COM (communication) ports

Each COM port of the product uses a unique I/O address and IRQ. Some previous SurePOS 500 system units used PCI-based COM ports with a shared IRQ. The system BIOS configures the COM ports for use by the operating system; therefore, a separate driver is not required. (Serial port drivers from previous SurePOS 500 systems are not supported or required.)

Use the CMOS Setup Utility to configure or modify the COM ports, the default I/O address and the IRQ. If you make modifications, ensure that each port uses a unique I/O and IRQ value. Using default values are highly recommended. The *IBM SurePOS 500 Series Operating System Installation Guide for Models 526, 566, and E2S* provides a list of port resources.

Using the IBM Diagnostics for POS Systems and Peripherals package

Diagnostics for the SurePOS 500 Models 526, 566, and E2S are available on the IBM Diagnostics for POS Systems and Peripherals package. This package installs to a memory key (see “Supported memory keys” on page 22).

Note: The Diagnostics also support IBM POS I/O on prior systems, if the BIOS supports booting from a memory key.

Locate the instructions for using this package in the README file. This package provides menu-driven tests and utilities that enable trained service technicians to configure and test the I/O devices. Locate and download the service program code from the IBM Retail Store Solutions Web site using the following steps:

1. Obtain a memory key. See “Supported memory keys” on page 22.

2. Access the IBM Retail Store Solutions Web site at: www.ibm.com/solutions/retail/store/support.
3. Select **Support** on the left side of the panel, then select **IBM SurePOS 500/600 Series**.
4. Next, select **SurePOS 500-xx6 Downloads**.
5. Download the update program to a temporary location on the PC's hard-disk drive. Run the self-extracting program and respond to the messages that display. This program writes the updates and provides instructions on inserting the memory key.
6. If you have *not* previously changed the CMOS Utility settings, you can boot into the diagnostics using the USB memory key: Insert the USB memory key and power on the system. If you have previously changed the default settings, go to Step 7.
7. If you have changed the default settings of the CMOS Setup Utility, follow these steps:
   a. Ensure that the Hard Disk is listed as the First Boot Device under **Advanced BIOS Features**, **Hard Disk Boot Priority**.
   b. Power off the machine.
   c. Plug the memory key into a USB port.
   d. Power on the machine. The system BIOS recognizes the memory key and adds it to the lists displayed by the CMOS Setup Utility.
   e. Open the CMOS Setup Utility settings. Ensure that your settings are as follows:
      - Under **Advanced BIOS Features**, **Hard Disk Boot Priority**, ensure that memory key is listed first.
      - Under **First Boot Device**, ensure that **Hard Disk** is listed first.
   f. Save these settings and exit. The system will boot automatically using the memory key and the diagnostics program begins.

You have the option of using an attached keyboard, if available. The diagnostics program will ask you to accept the user license agreement. Click the **I Agree** button. You will be presented with a screen containing a selection menu for System Components, Point Of Sale Devices, and Utilities (for VPD, and others). Sub-menus are dynamically-tailored based upon your system—only tests available for your machine type are displayed.

Supported memory keys

The following memory keys are supported by the SurePOS 500 Models 526, 566, and E2S:

IBM USB 2.0 (256 MB)

- FRU: 41D9746

Go to www.ibm.com for details on this USB key.

PNY USB 2.0 (1 GB)

- Part number: P1886C53

Go to http://www2.pny.com/homepage.aspx for details on this USB key.

Updating the BIOS

The IBM SurePOS 500 system BIOS can be updated via three methods:

1. USB Floppy Diskette
2. USB Memory Key
3. Windows xFlash

Details regarding the BIOS update process as well as the individual BIOS update packages, can be downloaded from the following IBM SurePOS 500 support site: http://www2.clearlake.ibm.com/store/support/html/surepos500.html.

1. Follow the steps described in “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21
2. Switch the system ON again. The system boots from the memory key, the BIOS update occurs.
3. Remove the memory key. The new BIOS update is on the system.

Note: The BIOS utility saves and restores your CMOS setting.

Power interruption during BIOS update procedure

If power is interrupted during the BIOS update procedure, the BIOS could become corrupted. Should this event occur, the system boots automatically from a backup copy of BIOS. To repair the corrupt version of BIOS and return to using the normal BIOS, repeat the steps to update the BIOS. If there is a power interruption during a BIOS update, the initial boot after a power interruption may take several seconds for the system to respond.

Repairing the BIOS

Two separate copies of POST/BIOS are maintained in separate flash regions. Should the primary copy become corrupt, the system automatically runs from the backup copy when rebooted. A POST message indicates when the backup copy is in use. When this happens, it is important to perform a Flash Update, in an attempt to repair the primary copy and preserve the backup functionality. If the primary is permanently damaged, the system runs normally, but without backup capability for the BIOS, and the POST message appears at each boot up.

Diagnosing problems and troubleshooting

A software error or a hardware failure can cause a problem with the system. The following topics contain problem analysis instructions to help you determine the cause of a problem and resolve it.

Table 9 describes the servicing task and the section that contains information supporting the task.

Table 9. SurePOS 500 task information

Task	Go to
Diagnosing a problem.	"Preliminary checklist."
Update the BIOS.	"Updating the BIOS" on page 23.
Run the CMOS Setup Utility.	"Using the CMOS Setup Utility" on page 19.
Using the service program.	"Using the IBM Diagnostics for POS Systems and Peripherals package" on page 21
Obtain the part number for the FRU.	Appendix A, "Field replaceable units," on page 117.
Remove or replace a field-replaceable unit (FRU).	Chapter 5, "Installation and replacement procedures for the SurePOS 500 Series Models 526, 566, and E2S," on page 29.

Researching the Knowledgebase

You can determine if a product problem has been resolved. Just review the symptoms and fixes in the knowledge base at the IBM Retail Stores Solutions Web site.

1. Go to www.ibm.com/solutions/retail/store/.
2. Select **Support**.
3. Select **IBM SurePOS 500/600 Series**.
4. Select **Knowledgebase Tips and FAQs**.

Preliminary checklist

When you power on the SurePOS 500, the system performs a power-on self-test (POST). When the power LED stops blinking, POST is complete. If multiple beeps occur, perform the following steps to diagnose the problem.

1. Ensure that all power is connected and observe the power light to make sure that it is lit.
2. Ensure that all cables and I/O devices are connected correctly and securely.
3. Make sure that you correctly adjust the brightness setting, using the controls at the bottom right side of the display.
4. Record any error messages or symptoms for troubleshooting.

If you do not observe a specific error indication, continue problem resolution at "Troubleshooting symptoms and actions" on page 25.

Notes:

1. For internal options and peripheral devices, you can use the diagnostic service program to help resolve problems.
2. For devices with separate test instructions, refer to those instructions when testing.

3. When using application software, you may receive error messages that pertain to the software. Refer to the software manual for a description of those messages.

Troubleshooting symptoms and actions

If the SurePOS 500 system fails with no error message or beep code, see Table 10 to find problem symptoms and take the related action.

Note: Corrupted CMOS may cause unpredictable problems. Before exchanging the system board to resolve a problem, go to “Clearing the CMOS settings” on page 20 and reset CMOS. Often, a corrupted CMOS is the source of the trouble.

Table 10. Symptoms and actions

If the problem is...	Here's what to do.
No power light on the unit.	1. Ensure that the system unit is plugged into a working electrical outlet and replug the power cable at the power supply. 2. Verify that the tablet display cable is plugged into the tablet. 3. Verify that the button/LED card in the tablet is plugged in properly. 4. Verify the power supply is properly installed. 5. Replace the power supply. See “Power supply” on page 46. 6. Replace the system board. See “System board” on page 48.
Operator display exhibits: Blank screen No cursor displayed Screen is unreadable Other display problems.	1. Adjust the brightness control at the bottom right side of the display. 2. Ensure that the tablet display cable is securely connected. 3. Switch the unit off and then power on. 4. Run the operator display test using the diagnostic service program. 5. Replace the LCD assembly. See “Front bezel assembly” on page 55. 6. Replace the system board. See “System board” on page 48.
For details on cash drawer removal and replacement procedures, see the *IBM Point of Sale Options and I/O Devices Service Guide,* GC30-9737. Throughout this text, this book is referred to as the *I/O book*.	
Cash drawer does not open when cash drawer key is turned to the open position.	1. Replace the keylock insert if the lock does not turn with the key. See the I/O book. 2. Gently pull the drawer open while holding the key turned to the open position to determine if the slide assembly is binding. Look for items that may cause binds, such as pens or paper clips. Replace the slide assembly if necessary. 3. Replace the cam, pawl, and spring kit. 4. Check for a bent actuator rod. Replace the actuator rod if necessary.
Cash drawer does not stay closed.	1. Make sure that the keylock is not bound in the open position. Replace the keylock if necessary. 2. Replace the cam, pawl, and spring kit. 3. Replace the latch and the sensor assembly card. 4. Replace the cash drawer. 5. Replace the system board. See “System board” on page 48.

Table 10. Symptoms and actions (continued)

Cash drawer does not open or close smoothly, or appears to be binding.	1. Look for items that could cause binding. Pens or paper clips trapped between the drawer and cover or the drawer and base could cause binding. 2. Compact drawer only: Remove the drawer and the rollers at the rear of the drawer and at the front of the base. Replace the rollers if necessary. 3. Determine if the slide assembly in the base is binding. Replace the slide assembly if necessary.
Cash drawer not opening	1. Run the CMOS Setup Utility and confirm that IBM cash drawer setting is enabled. 2. Ensure that the cash drawer cable is securely connected. 3. Replace the cash drawer cable. 4. Replace the cash drawer latch assembly. 5. Replace the system board. See “System board” on page 48.
Cash drawer does not open when performing store transactions or running cash drawer tests, but it opens when the cash drawer key is turned to the open position.	1. Replace the latch and the sensor assembly card. 2. Replace the cash drawer cable. 3. Replace the system board. See “System board” on page 48.
The status displayed by the cash drawer tests does not match the physical status of the cash drawer being tested. For example, the test indicates that cash drawer A is closed when cash drawer A is actually open.	1. Replace cable. 2. Replace the latch and the sensor assembly card. 3. Replace the system board. See “System board” on page 48.
Magnetic stripe reader (MSR) not reading.	1. Check the three-track MSR dip switch settings for either RS232 or keyboard interface. 2. Run the CMOS Setup Utility and check the setting in the MSR serial port. 3. Ensure that the MSR cable is securely connected. 4. Run the MSR test using the diagnostic service program. 5. Reset to factory defaults by pressing the Reset button with a paper clip. The MSR must be removed temporarily from the side of the tablet to access the reset button. Leave the MSR cable connected, and the unit powered ON when pressing the Reset button. 6. Replace the MSR. See “Magnetic stripe reader (MSR)” on page 65.
Operator display backlight: dark, dim, or partially lit.	1. Adjust the brightness using the button located on the front of the display. 2. Ensure tablet display cable is securely attached under display tablet and at system board. 3. Replace the LCD assembly, see “Front bezel assembly” on page 55.
Touch-sensitive screen not working.	1. Ensure tablet display cable is securely attached under display tablet and at system board. 2. Run the touch-sensitive screen test using the diagnostic service program. 3. Reinstall the touch driver. 4. Replace the front touch bezel assembly. See “Front bezel assembly” on page 55. 5. Replace the LCD assembly. See “Front bezel assembly” on page 55.

Table 10. Symptoms and actions (continued)

PS/2 keyboard does not work or only some keys work.	1. Ensure that the keyboard cable is securely connected. 2. Move your fingers across the keys, making sure that no keys are stuck. 3. Ensure that you are on a window that allows typing. Some windows do not allow you to type on them. 4. Run the keyboard test from the diagnostics program. 5. Replace the keyboard.
Diskette drive does not work.	1. Check the diskette drive cable connections. 2. Run the CMOS Setup Utility and confirm that the diskette drive controller is enabled. 3. Ensure that the correct boot device is selected in the CMOS Setup Utility, USB–FDD. 4. Verify the hardware by attempting to load a bootable diskette. 5. If the drive will not boot with a bootable diskette, replace the drive and cable. 6. Replace the system board. See “System board” on page 48.
Audio is not working.	1. Check the volume control. 2. Check the speaker cable connections. 3. Run CMOS Setup Utility and confirm that the audio is enabled. 4. Replace the speaker. See “Speaker” on page 61. 5. Replace the system board. See “System board” on page 48.

Notes:

1. Some devices that attach to the system have test instructions. Refer to those instructions when testing those devices.
2. Record any error messages or symptoms for future reference.
3. When using application programs, you may receive error messages that pertain to the application software. See the application program manual for a description of those messages.

CMOS recovery

If the CMOS memory becomes corrupt and the system does not boot, restore the factory default values by following the procedure described in “Clearing the CMOS settings” on page 20.

Always reset CMOS before replacing a system board to resolve a problem. This practice allows you to determine if a corrupt CMOS is the source of the trouble. A corrupt CMOS can cause unpredictable problems.

Chapter 5. Installation and replacement procedures for the SurePOS 500 Series Models 526, 566, and E2S

This section contains the FRU removal and replacement procedures for all SurePOS 500 Models 526, 566, and E2S.. Some procedures are for features that are not available on all models.

Notes:

1. Before you perform any removal and replacement procedures, reference *IBM Safety Information — Read This First*, GA27-4004.

2. The machine serial number for the unit is located on the lower left, front frame. See Figure 4 on page 11.
3. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static protective bags until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is contained in its anti-static bag, touch it and your finger to an unpainted metal part of the system unit for at least 2 seconds. (This action removes static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system, without putting it down. If it is necessary to put the device down, place it onto its static-protective bag. (If your device is an adapter, place it component side up.) Do not place the device onto the cover of the system or onto a metal table.
- Take additional care when handling devices during cold weather because heating reduces indoor humidity and increases static electricity.

Modular service tools

The SurePOS 500 Models 526, 566, and E2S were designed for modular servicing and require minimum use of tools. However, some field replacement parts may require a tool. Table 11 lists the part number for tools that you may need for servicing.

Table 11. Service personnel tools

Description	Part Number	Units
Wrap plug, Ethernet	03N6070	1
Wrap plug, RS-232	72X8546	1

Diagnostic wrap plugs

The following list provides the diagnostic wrap plug pinouts.

Serial 9-Pin D-Shell

- Pins 1 - 7 - 8
- Pins 2 - 3
- Pins 4 - 6 - 9

Ethernet

- Pins 3 - 5
- Pins 4 - 6

Note: A parallel port is not available on the SurePOS 500 Models 526, 566, and E2S.

Opening and removing covers and assemblies

The SurePOS 500 Models 526, 566, and E2S is designed for modular servicing and installation. Table 12 shows the progression and ease of some common removals.

Table 12. Pictorial overview of common removal tasks

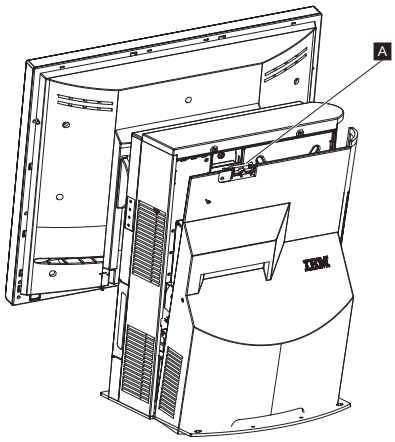
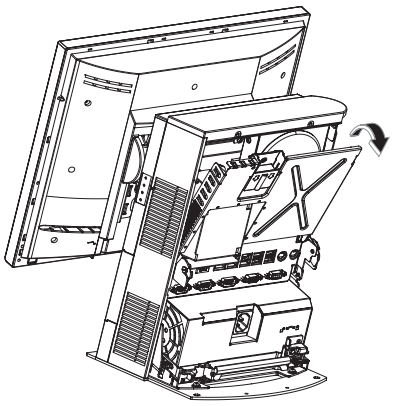
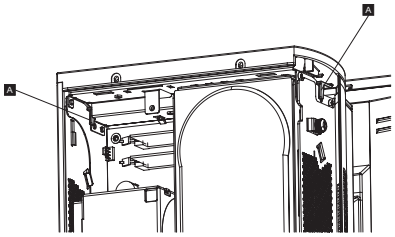
	Task:	Section with complete details:
	Opening the rear cover	“Rear cover removal” on page 35
	Opening the tailgate	“Opening the I/O tailgate cover” on page 36
	Removing the top cover	“Top cover removal” on page 37

Table 12. Pictorial overview of common removal tasks (continued)

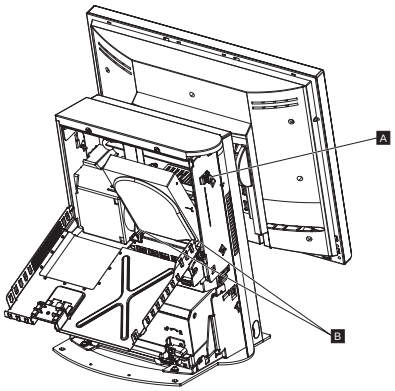
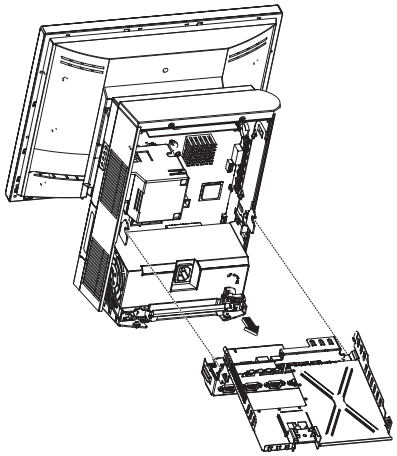
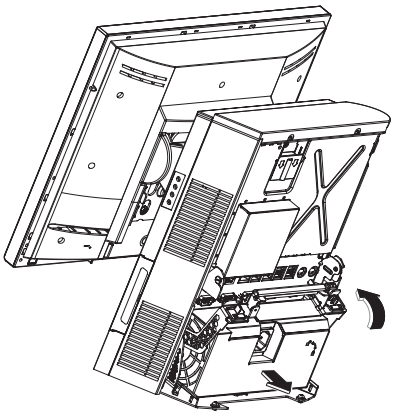
	Task:	Section with complete details:
	Removing the hard-disk drive	“Hard disk drive” on page 38
	Removing the tailgate	“Removing the I/O tailgate cover (rear connector panel)” on page 43
	Removing the power supply	“Power supply” on page 46

Table 12. Pictorial overview of common removal tasks (continued)

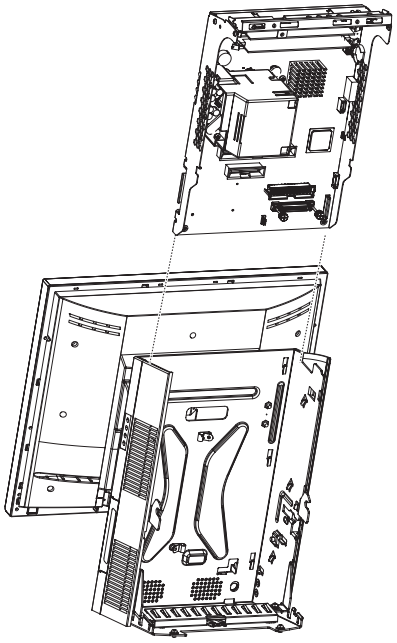
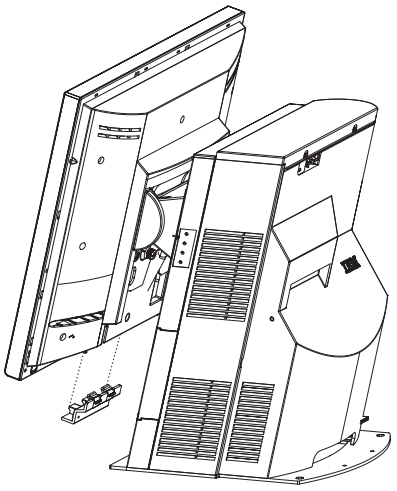
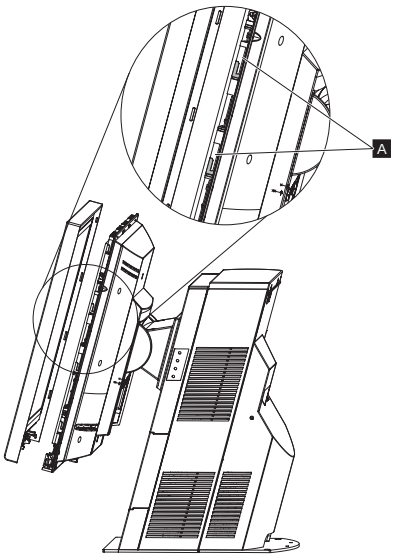
	Task:	Section with complete details:
	Removing the system board	“System board” on page 48

Table 12. Pictorial overview of common removal tasks (continued)

	Task:	Section with complete details:
	Opening the touch-cable cover	“Front bezel assembly” on page 55
	Removing the front bezel	

Note: These pictures represent only some of the common component removals.

Rear cover removal

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Facing the rear of the system, press down on the latch **A**, and pull back the rear cover as shown in Figure 8, then lift the rear cover away from the unit.

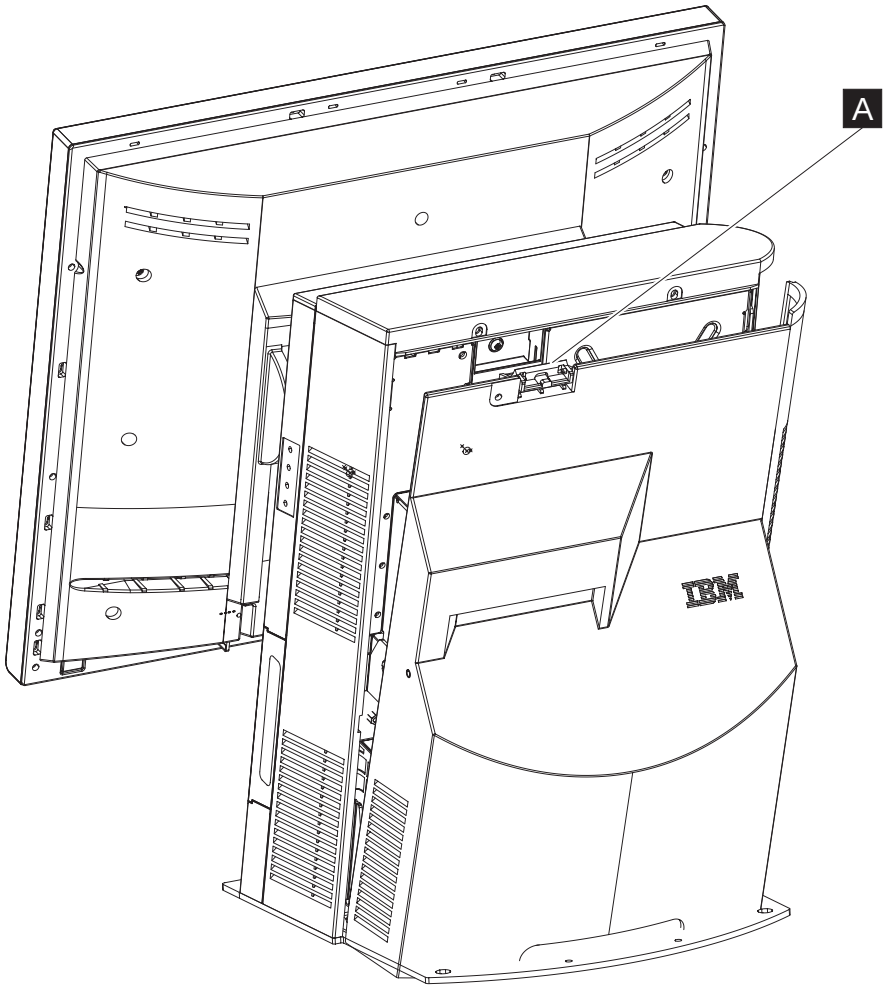


Figure 8. Removing the rear cover

3. To replace, reverse these procedures.

Opening the I/O tailgate cover

Open the I/O tailgate cover as follows:

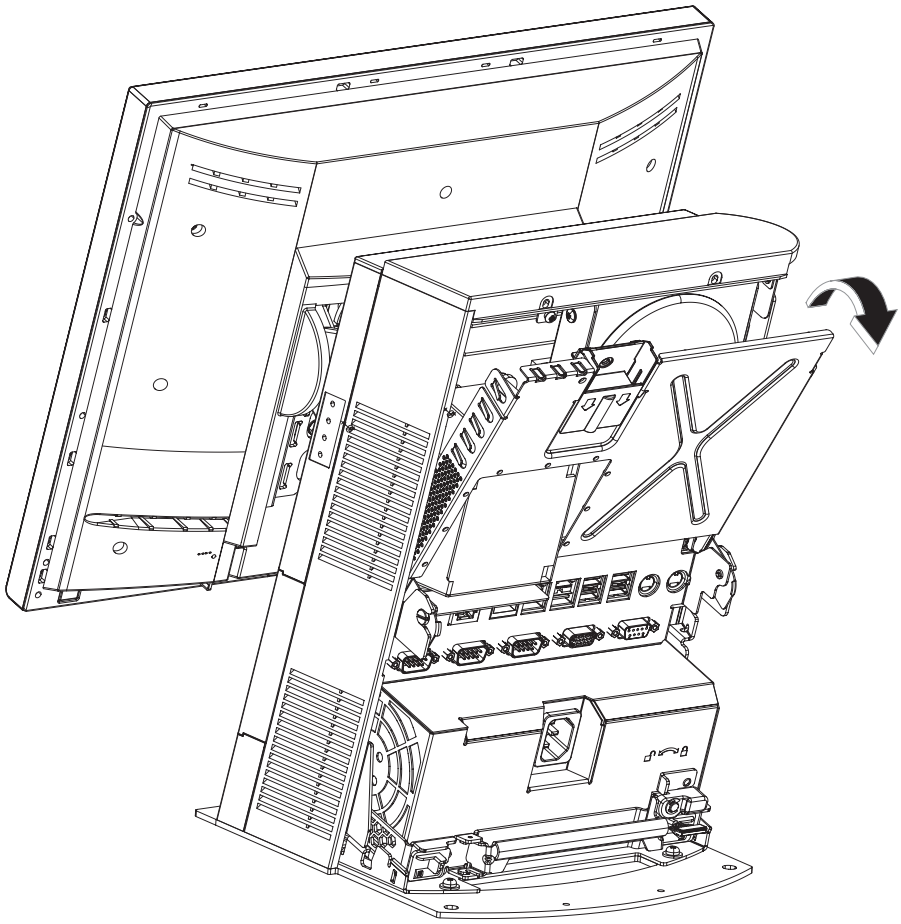


Figure 9. Opening the I/O tailgate cover

1. Remove the rear cover as described in “Rear cover removal” on page 35.
2. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as seen in Figure 9.

Top cover removal

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover, following the procedure in “Rear cover removal” on page 35.
3. Open the I/O tailgate cover (see “Opening the I/O tailgate cover” on page 36).

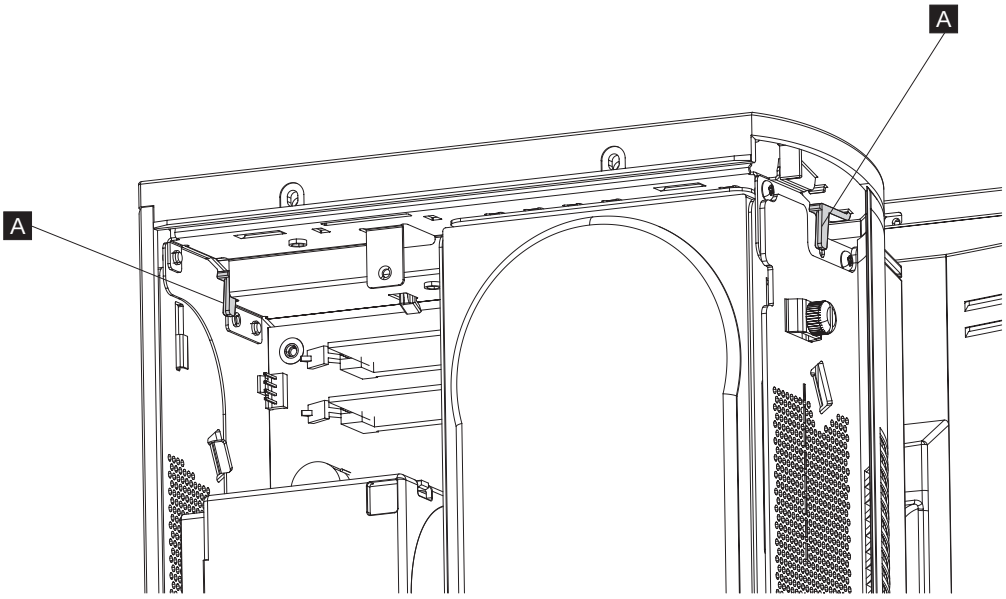


Figure 10. Locating the top cover release latch

4. Facing the rear of the system, lift latch on the left and right (**A** as shown in Figure 10), while sliding the top cover toward the rear of the unit.
5. To replace, slide the top cover on from the rear.

Hard disk drive

Attention: The hard disk drive (HDD) is a static-sensitive device. See “Handling static-sensitive devices” on page 30. Use care not to drop or jar the HDD during assembly. Do not use an impact power driver.

Note: The HDD and bracket are available together as one FRU, and are also available separately.

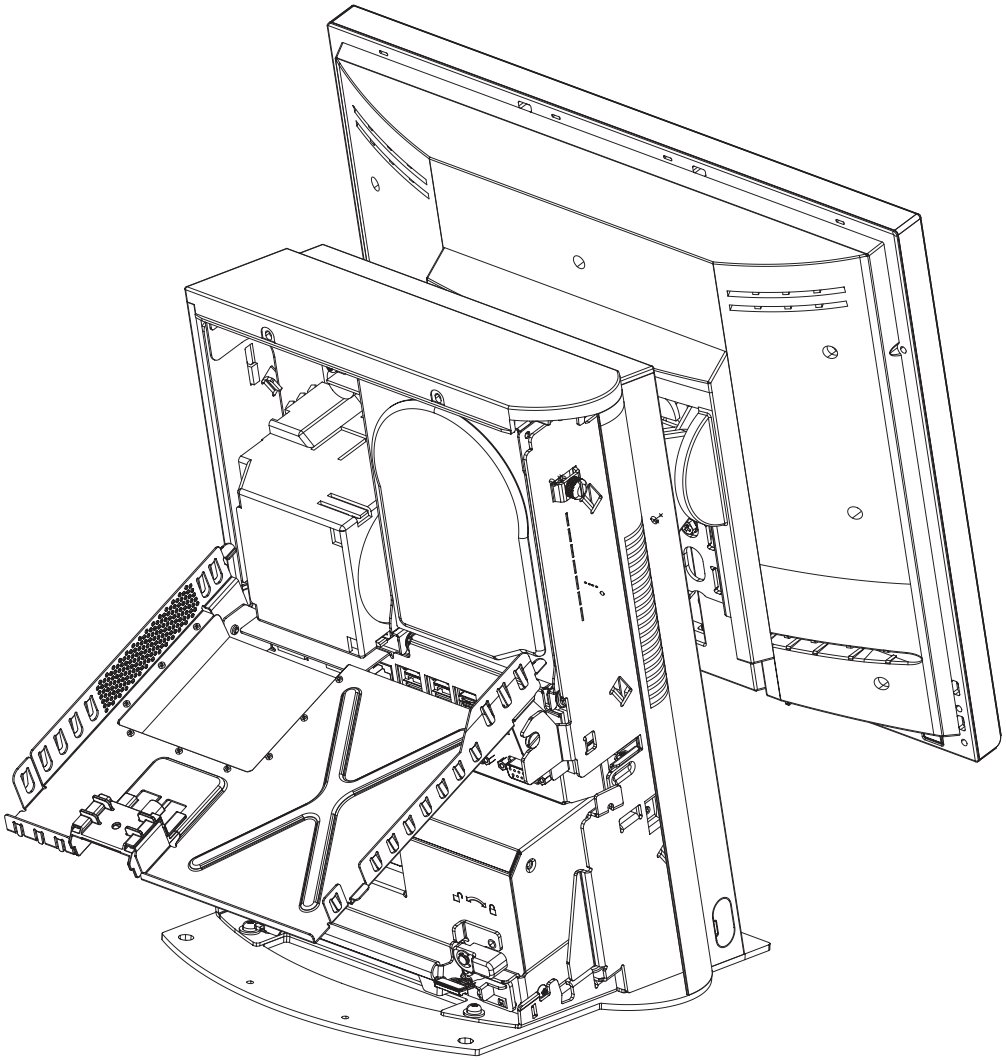


Figure 11. HDD installation. For clarity, this figure shows additional components removed; however, you do not need to remove these to remove the HDD.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Open the I/O tailgate cover as described in “Opening the I/O tailgate cover” on page 36.
3. Loosen the thumbscrew as shown in Figure 12 on page 39 **A** and rotate the hard drive back.
4. Unhook cables from the back of the hard drive bracket.

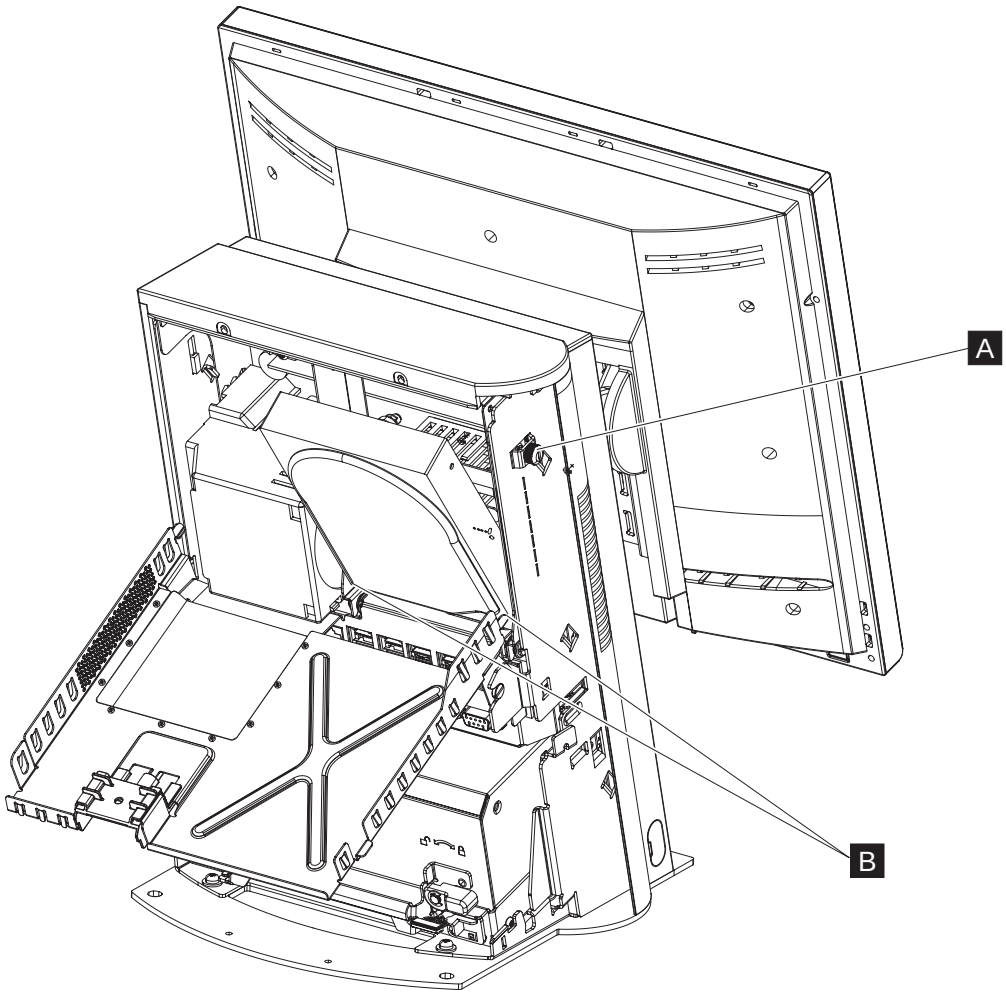


Figure 12. Removing the hard disk drive and bracket. For clarity, this figure shows additional components removed. However, you do not need to remove these to remove the HDD.

5. Remove the HDD assembly by lifting it off of the hooks on the frame Figure 12 **B** .
6. Unhook cables from the bottom of hard drive.
7. If the HDD is a separate FRU, place the HDD on a flat surface and remove the four screws and bracket.
8. Place the old HDD in protective packaging.
9. Attach the bracket to the new HDD with the four screws.
10. Reinstall the HDD and bracket assembly:

    Note: Ensure that the SATA cable does not deform the capacitors on the planar board when the HDD is reinstalled

    a. Reconnect the power and data cables to the HDD.

    b. Reinsert the HDD and bracket into the frame hooks, rotate into position, and tighten the thumbscrew.
11. Close the I/O tailgate.
12. Replace the rear cover.
13. Power on the system and use the CMOS Setup Utility to verify that the system recognizes the new HDD.

Note: If the system fails to recognize the new HDD, verify that all connectors are properly seated and that the address jumper is correctly installed. If the HDD requires a jumper to be recognized as Drive 0, the correct position is indicated on a label on the HDD.

Memory modules

Attention: Establish personal grounding before touching this unit.

All system boards have two memory sockets. See Figure 13. The factory-installed base memory occupies one of the sockets. If the order is greater than the base memory, there may or may not be an empty socket.

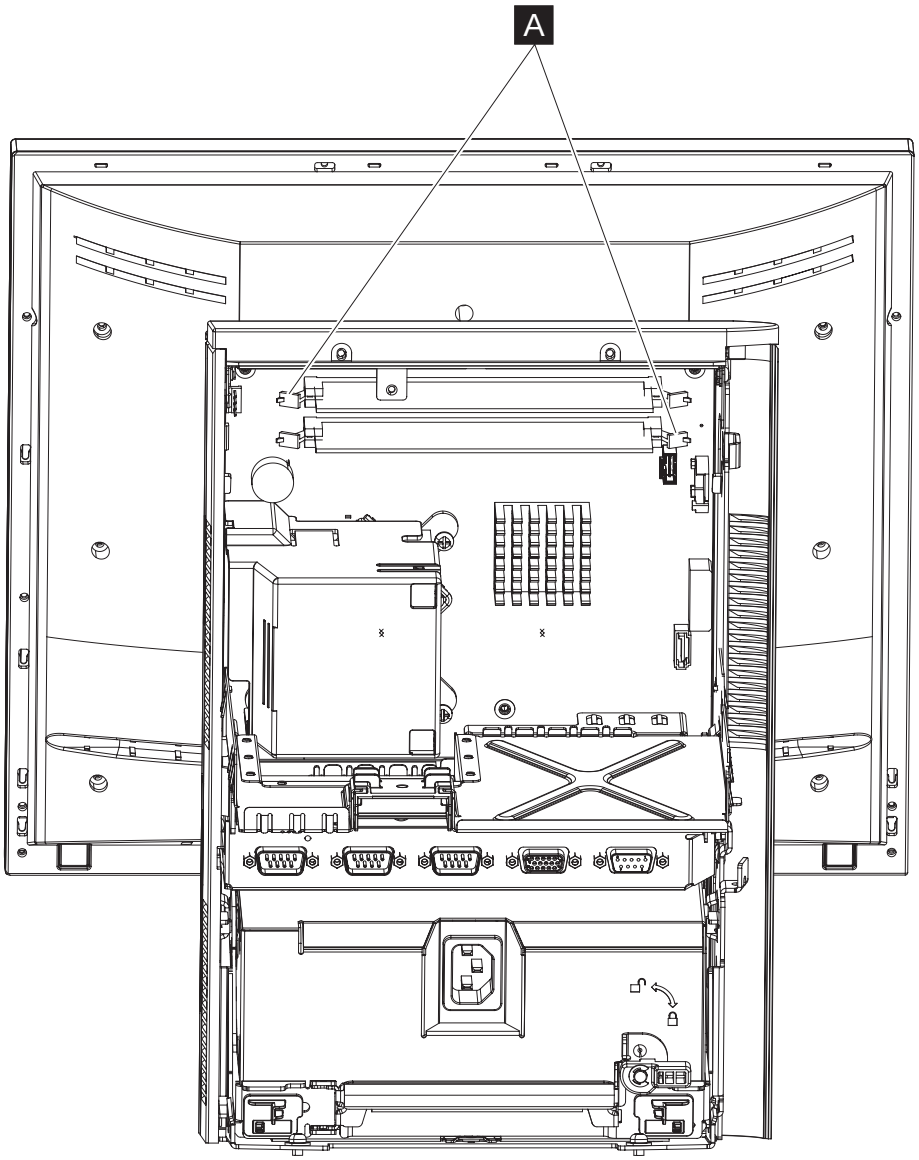


Figure 13. Memory socket location

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in“Rear cover removal” on page 35.
3. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.
4. The hard disk drive must be rotated down but does not have to be removed to install memory.

5. Locate the memory modules. See **A** in Figure 13 on page 41.

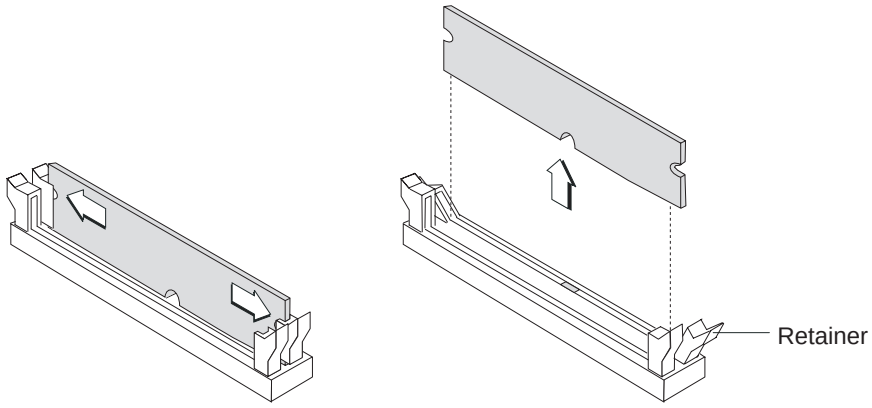


Figure 14. Memory module removal

6. Press the latches away from the module as shown in Figure 14.
7. Touching only the top corners of the module, pull it gently until it is free from the socket.
8. Before inserting a replacement module, note the alignment notch along the bottom of the module and where the module plugs into the slot.
9. Carefully align the module in the slot and then press it into the slot until it is secured by the clip.

   Note: Ensure the memory module is fully seated in the socket and the retainer tabs are fully upright and engaged in the memory module side notches.
10. To replace, reverse these procedure.

Memory modules and industry standards

You should only use memory provided by IBM Retail for use in Models 526, 566, and E2S. Although advertised as *industry standard*, all memory does not work with every product. IBM performs extensive life and reliability testing to insure that memory offered by IBM will operate correctly over all voltage and temperature ranges.

Removing the I/O tailgate cover (rear connector panel)

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described at “Rear cover removal” on page 35.
3. Cables can be left attached to the tailgate if desired. They will have to be released from the cable tie bar.
4. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.

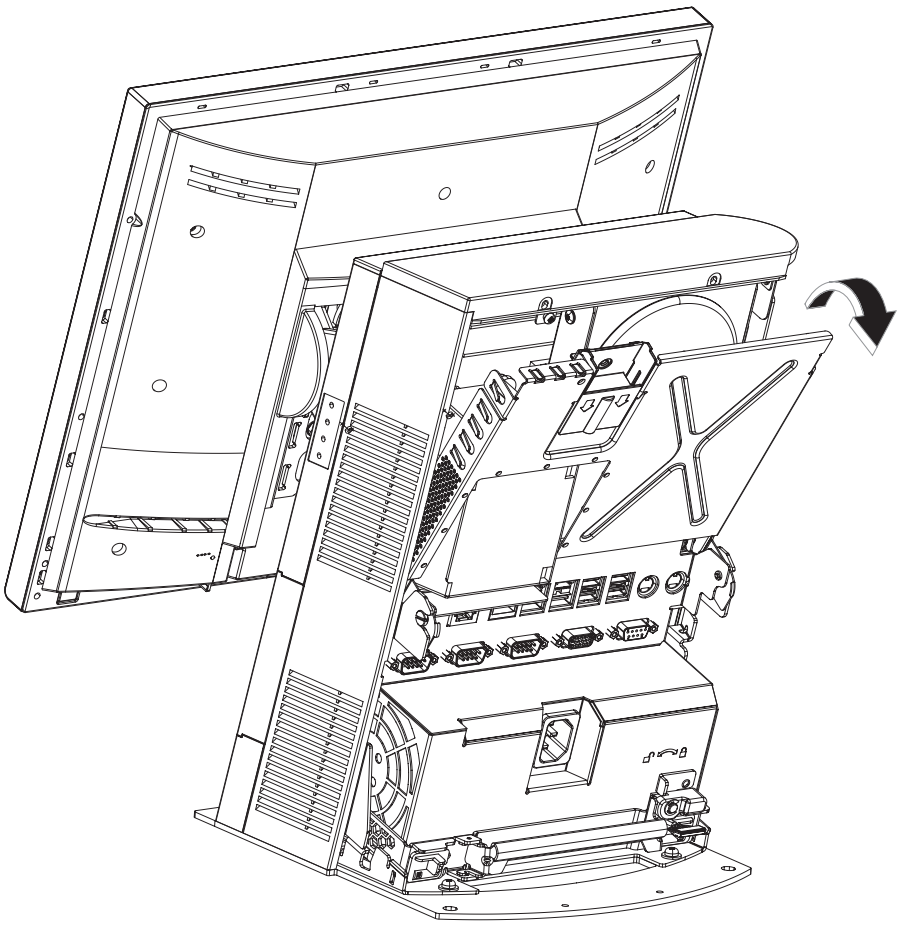


Figure 15. Opening the I/O tailgate cover

5. Remove the hard drive as described in steps 3 and 4 at “Hard disk drive” on page 38.
6. As shown in Figure 16 on page 44, carefully remove the I/O tailgate cover from the system board.

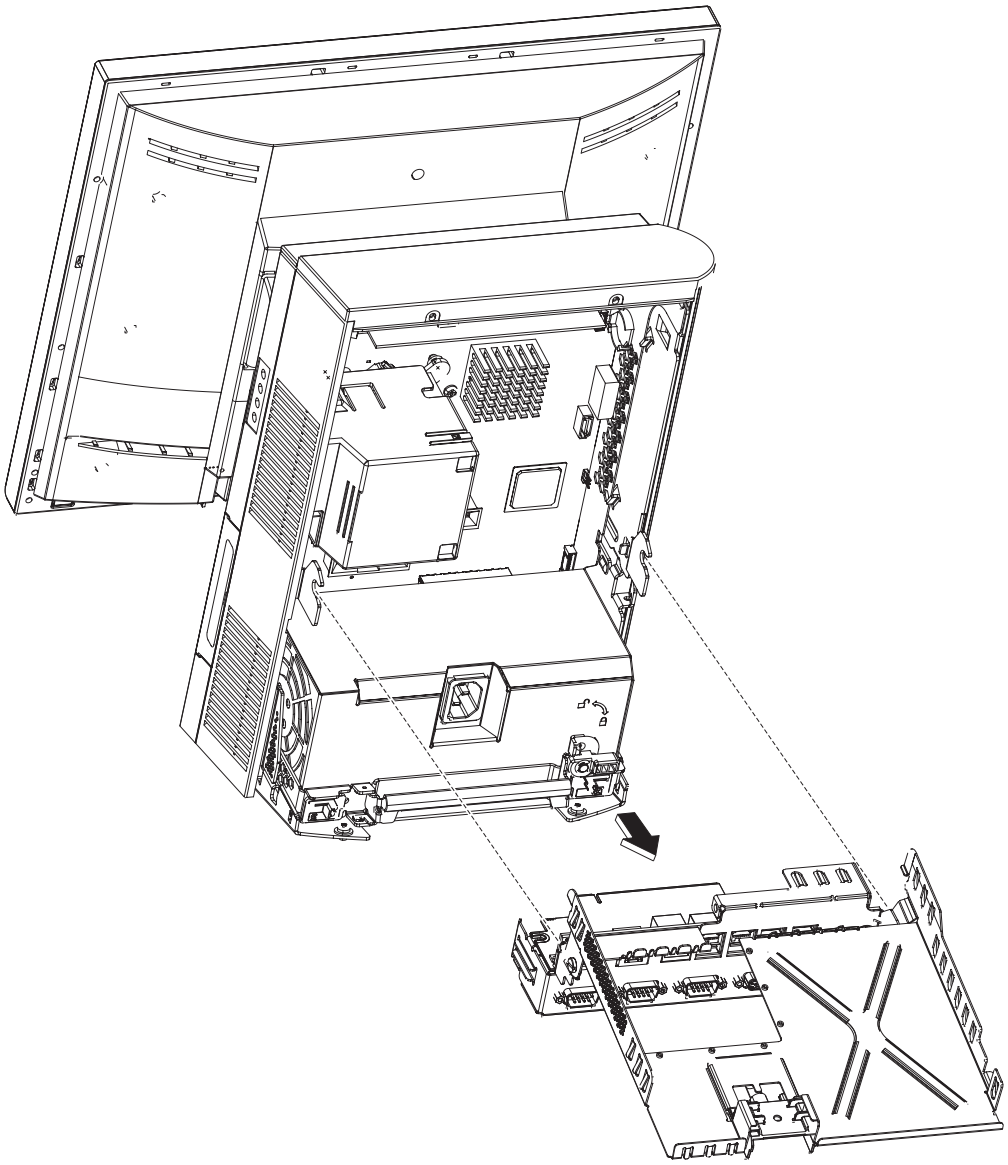


Figure 16. Removing the tailgate

7. To replace, reverse these procedures. Carefully slide the tailgate cards back into the system board.

Cable tie bar

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Follow the instructions described in “Rear cover removal” on page 35.

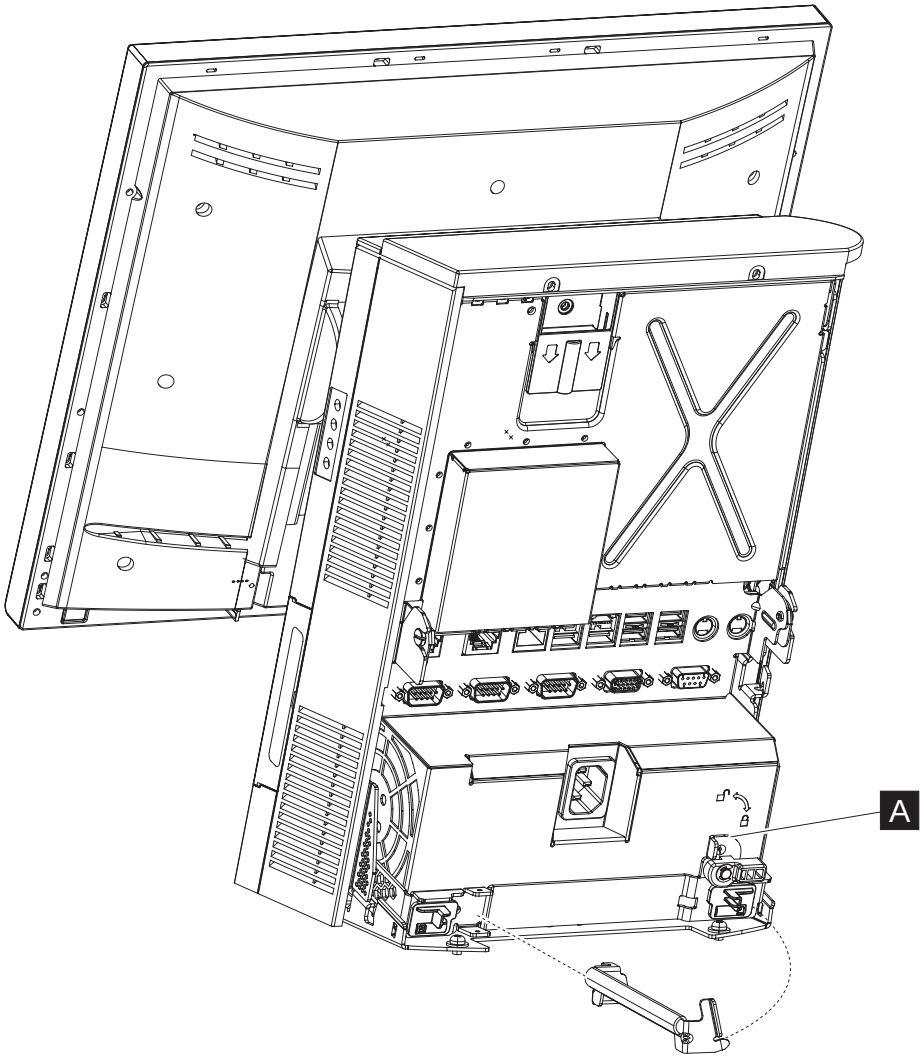


Figure 17. Removing the cable tie bar

3. Lift the latch **A**, as shown in Figure 17.
4. Remove the cable tie bar from the hinge by rotating and sliding it from the slots.
5. To replace, reverse these procedures.

Power supply

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the back cover as described at “Rear cover removal” on page 35.
3. Remove the cable tie bar as described at “Cable tie bar” on page 45.
4. Unplug the AC power cord on the back of the power supply.
5. Unlatch the power supply latch arm by pushing in on the two tabs and swinging the arm upward until it stops.
6. Pull the power supply out.

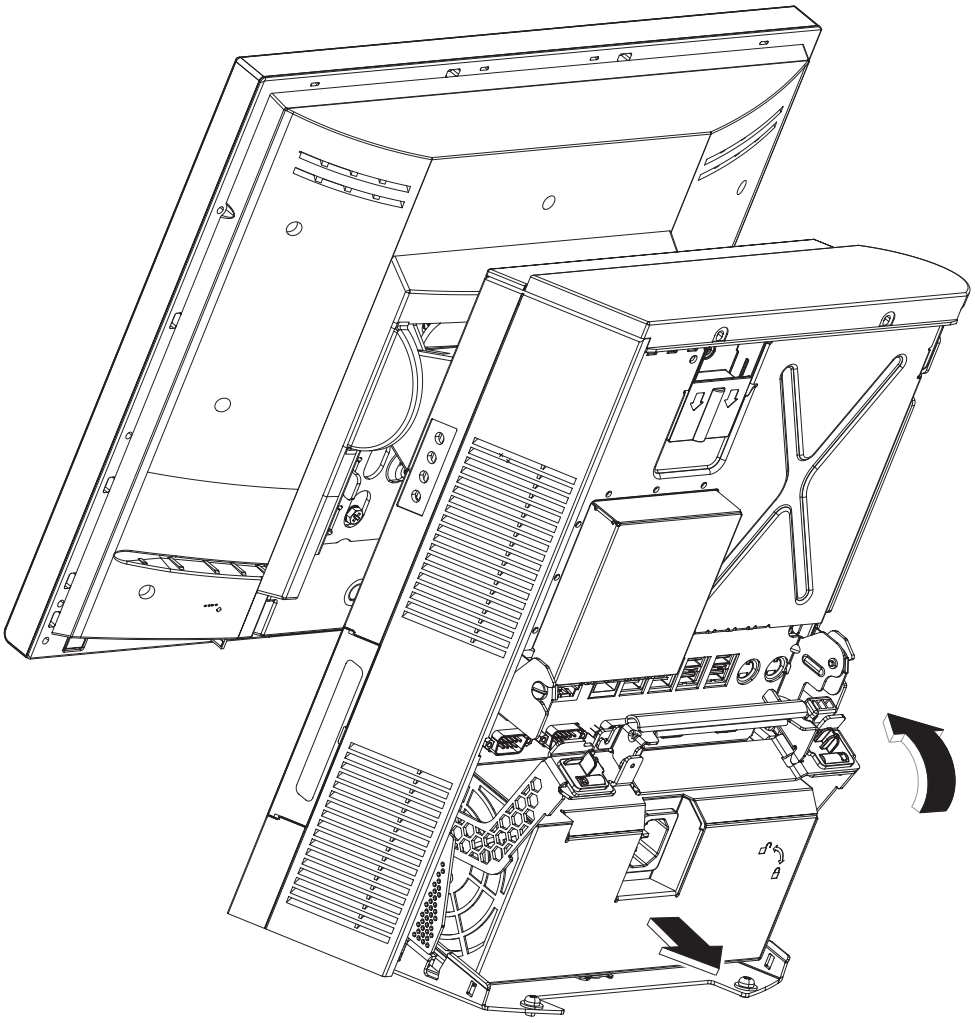


Figure 18. Removing the power supply

7. To replace, make sure the latch arm is all the way up. Slide the power supply into the bottom of the system unit until it stops. Ensure that the power supply latch arm hooks go inside the metal frame.
8. Pull the latch arm down.

Power supply latch arm

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Follow the instructions described in “Rear cover removal” on page 35.
3. Follow the instructions described in “Power supply” on page 46.

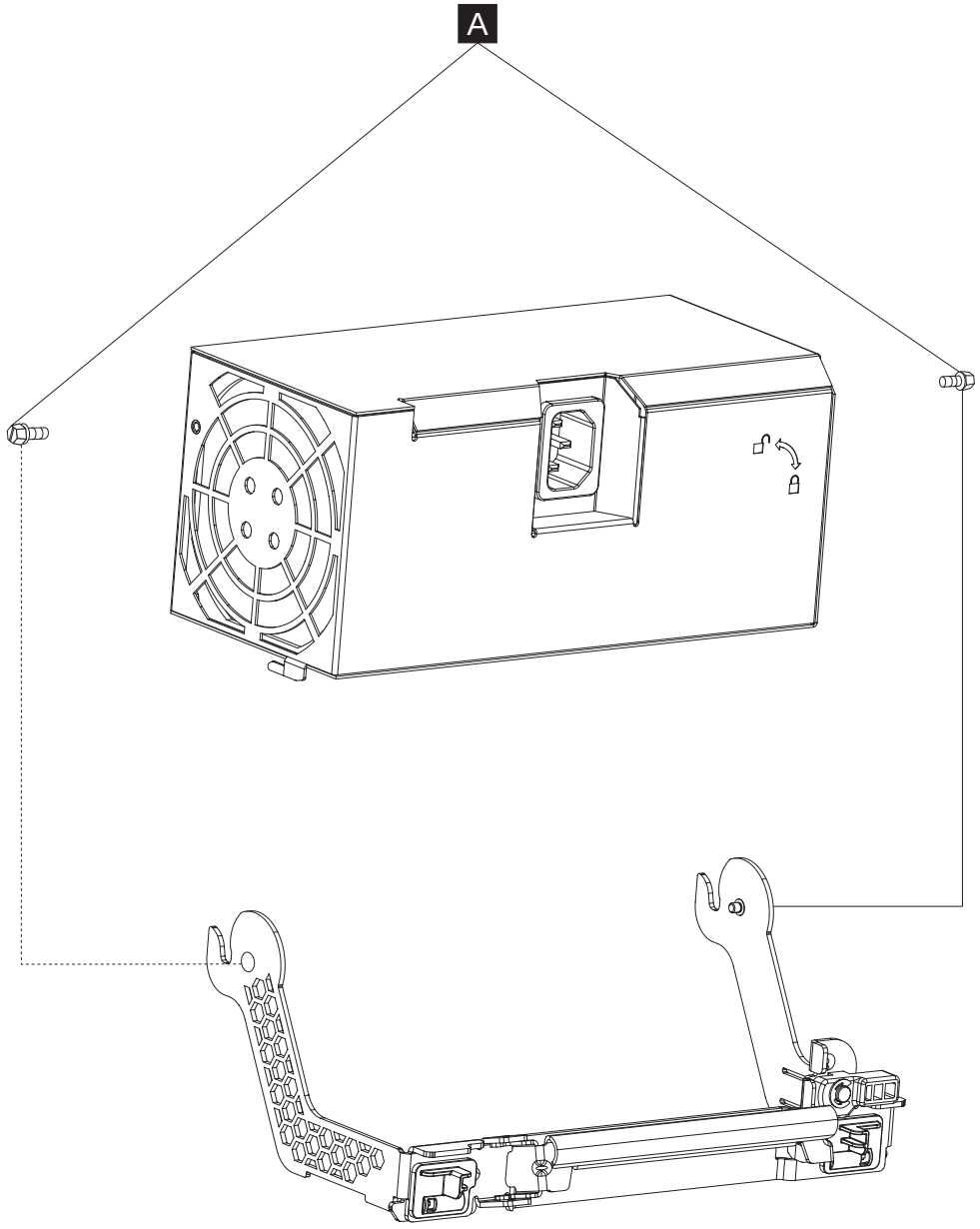


Figure 19. Removing the power supply latch arm

4. Remove screws (**A**) and then lift off the power supply.
5. To replace, reverse these procedures.

System board

Attention: Establish personal grounding before touching this unit.

Note: The system board assembly comes with a tray and top cover.

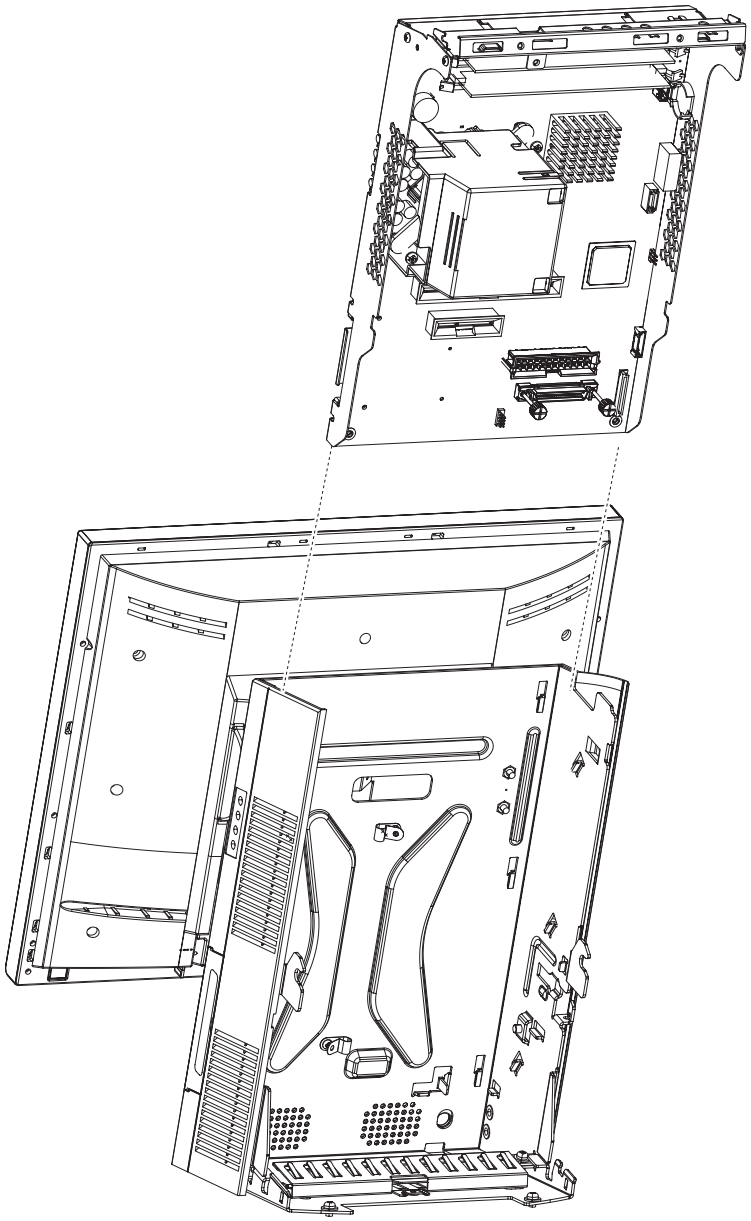


Figure 20. Removing the system board

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in“Rear cover removal” on page 35.
3. Cables can be left attached to the tailgate if desired. They will have to be released from the cable tie bar.
4. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.

5. Remove the hard drive as described in steps 3 and 4 at “Hard disk drive” on page 38.
6. Remove the I/O tailgate cover as described in “Removing the I/O tailgate cover (rear connector panel)” on page 43.
7. Remove the power supply as described in “Power supply” on page 46.
8. Disconnect the display cable as described in step 10 at “Display tablet cable” on page 54.
9. If this is a Premium model, remove the speaker as described in “Speaker” on page 61.
10. Grasp the entire system board assembly and slide it out toward the top as show in Figure 20 on page 48.
11. To replace, reverse these procedures.

Transfer modules to the new system board

Place the assembly on a table and remove the following parts:

- Memory modules – See “Memory modules” on page 41.
- Flash Drive
- Hard drive cables
- Heatsink, fan, and processor - See “Processor fan/heatsink/module assembly” on page 51.

Note: Premium models only

Install these parts on the new system board. The new system board comes with all required jumpers and with a new battery.

Update system software

1. Verify that the system BIOS is equal to or greater than that from the old system board. See “Updating the BIOS” on page 23.
2. Reprogram the Vital Product Data (VPD).
   a. Boot using the memory key.
   b. Choose **POS System Test**.
   c. Choose **Utilities**.
   d. Choose **Vital Product Data Utility**.
   e. Choose **Update VPD**.
   f. Choose the model and press **Enter**.
   g. Choose **Update VPD** again.
   h. Enter the machine serial number and press **Enter**.
   i. Exit.

System-board jumper location and settings

See “Clearing the CMOS settings” on page 20 for system-board jumper information.

System-board battery

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in“Rear cover removal” on page 35.
3. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.
4. Disconnect the hard drive as described in step 3 at “Hard disk drive” on page 38.
5. Remove the old battery from slot **A** as shown in Figure 21.

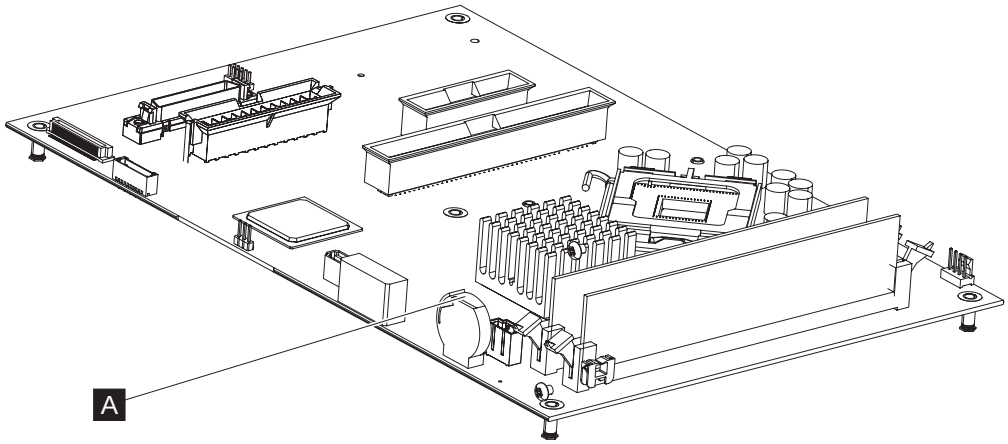


Figure 21. System-board battery

6. Facing the rear of the machine, insert the new battery with the positive side to the left.

Processor fan/heatsink/module assembly

Attention: The SurePOS Model 566 contains a LGA 775 CPU socket. This socket contains very finely pitched pins. You must take care when servicing the CPU as any damage to the socket results in a non-functional system board. Be sure to use the suction cup tool provided with the FRU processor.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in“Rear cover removal” on page 35.
3. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.
4. Remove the processor fan/heatsink. This only applies to the Premium Models of the SurePOS 500 units:
   a. Remove the fan/duct by pulling the duct off.
   b. Unplug the fan from the motherboard.
   c. Loosen the four screws that secure the heatsink.
   d. Remove the heatsink.

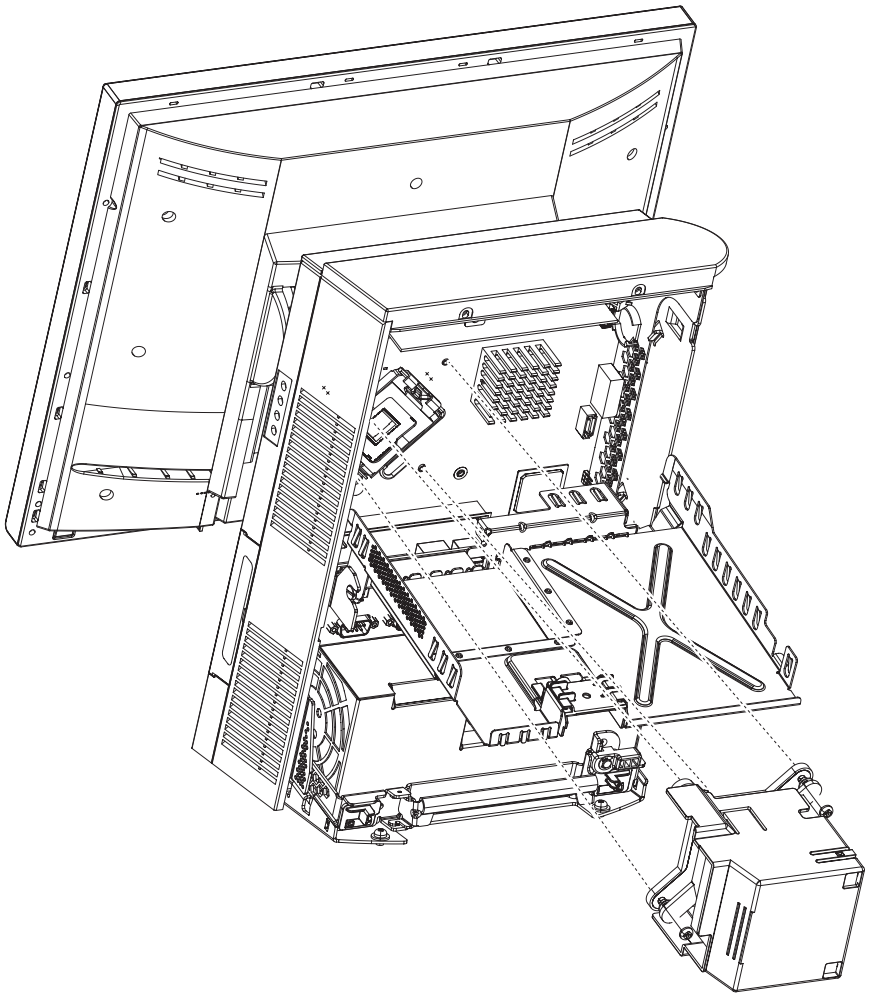


Figure 22. Removing the processor fan/ heatsink assembly. The placement of the unit in the top view is for illustrative purposes only.

5. Release the latch and carefully remove the processor from the system board.
6. Reverse these procedures to replace.

Note: If you are reusing the existing heatsink, make sure that the thermal material is not torn or damaged. Replace, if needed. The thermal material comes installed on a new heatsink or with a new processor.

Display tablet

Note: The display tablet can be mounted in three different height positions. Be sure to note the position of the tablet before it is removed to ensure the display is placed back in the same position. See “Display tablet positions” on page 53 for more details.

Follow these procedures to remove the display tablet.

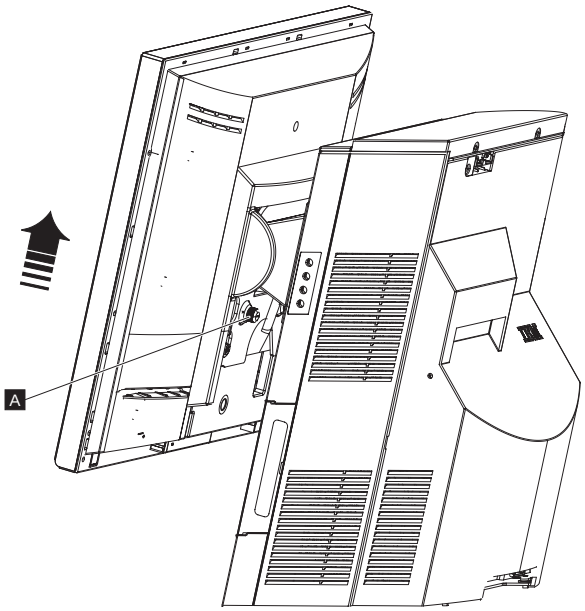


Figure 23. Removing the display tablet

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove any options that may be installed on the display unit.
3. Tilt the tablet back and loosen the two thumbscrews **A** in Figure 23 under the tablet.
4. Disconnect the cable from the rear of the tablet by pressing on both sides of the connector.
5. Lift the tablet off the unit.
6. To replace, reverse these procedures.

Display tablet positions

The top hooks on the bracket mounted to the back of the tablet fit into one of the following three different positions:

- Top, **B** in Figure 24.
- Middle, **A** in Figure 24.
- Bottom, **C** in Figure 24.

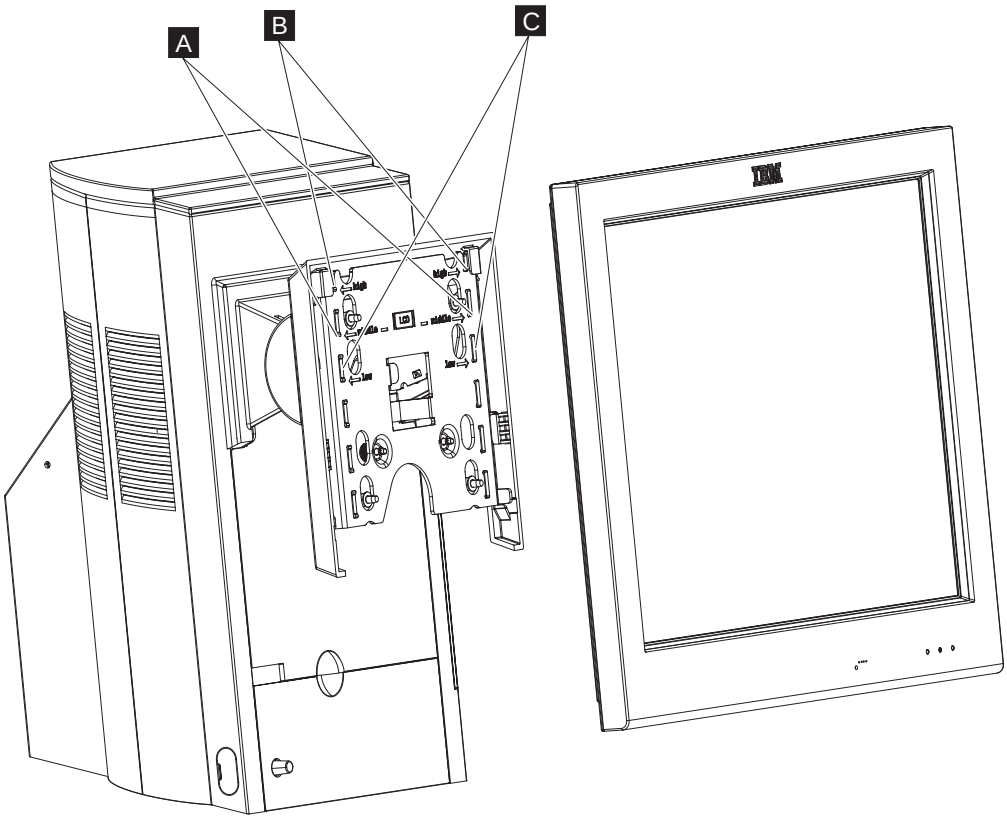


Figure 24. Display tablet positions

Display tablet cable

Note: To remove the display tablet cable, you must remove the display tablet first.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the tablet as described in “Display tablet” on page 52.
3. Disconnect the display cable from the rear of the tablet by pressing on either side of the connector.
4. Remove the rear cover as described in“Rear cover removal” on page 35.
5. Unlatch the I/O tailgate cover by pushing down and pulling back on the latch as described in “Opening the I/O tailgate cover” on page 36.
6. Remove the hard drive as described in steps 3 and 4 at “Hard disk drive” on page 38.
7. Remove the I/O tailgate cover as described in “Removing the I/O tailgate cover (rear connector panel)” on page 43.
8. Remove the power supply as described in “Power supply” on page 46.
9. Disconnect the display tablet cable from the system board by loosening the two thumbscrews (see Figure 25).

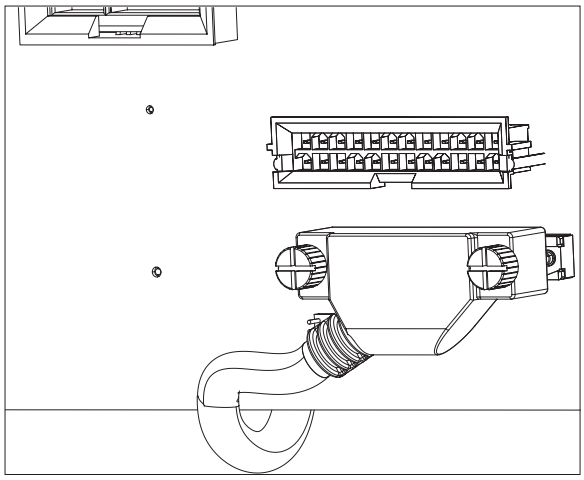


Figure 25. Removing the display tablet cable from the system board

10. Disconnect the speaker cable, if present. See “Speaker” on page 61.
11. Remove the system board as described in “System board” on page 48.
12. Remove the screws that secure the tablet cable to the system unit.
13. Pull the cable free from the display side of the unit.
14. To replace, reverse these procedures.

Front bezel assembly

Note: The front bezel is available as a FRU.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the touch cable door by pushing down on the tabs and rotating outward. The cable door will dangle from the connecting tie.

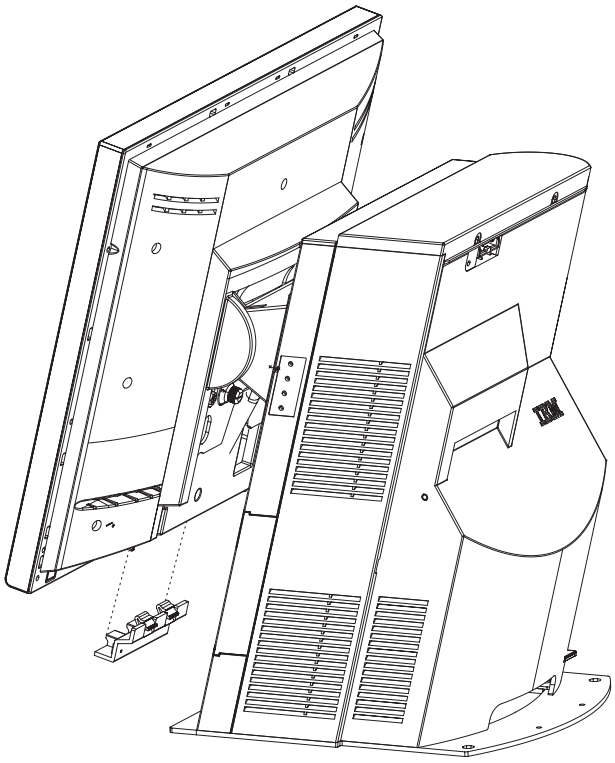


Figure 26. Disconnecting the touch cable and removing the front bezel

3. Follow directions (a) for Premium Models or (b) for Entry Models of the SurePOS 500.
   a. Disconnect the touch cable by lifting the connector lever to the open position and lifting out the cable. See Figure 27. **A** shows the lever in the open position. **B** shows the lever in the closed position.

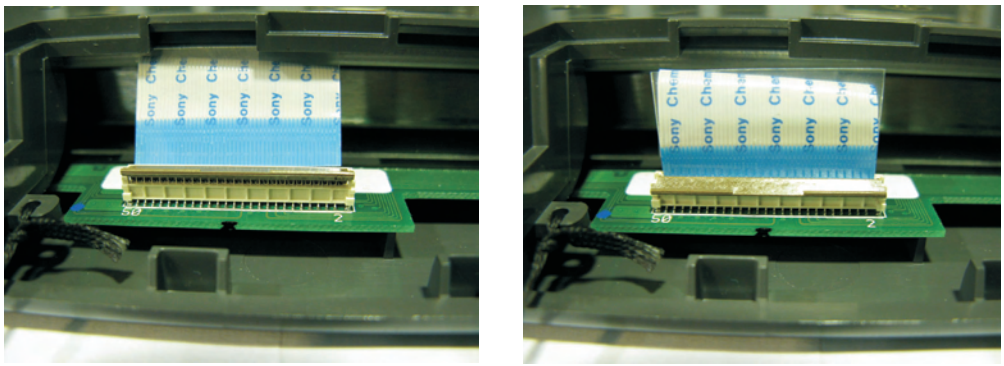


Figure 27. Premium touch cable positions

   b. Disconnect the touch cable by unlatching the standard key connector and pulling out the cable. See Figure 27. **A** shows the connector in the closed position. **B** shows the connector in the open position.

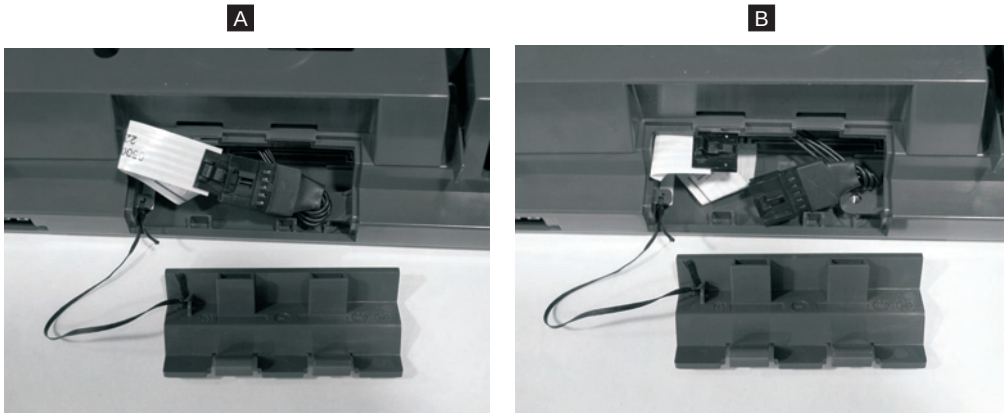


Figure 28. Entry touch cable positions

4. Press the two buttons on the backside of the display tablet to unlock the bezel, and lift upward until the bezel stops. See **A** in Figure 29 on page 57. Then pull the bezel away from the tablet.

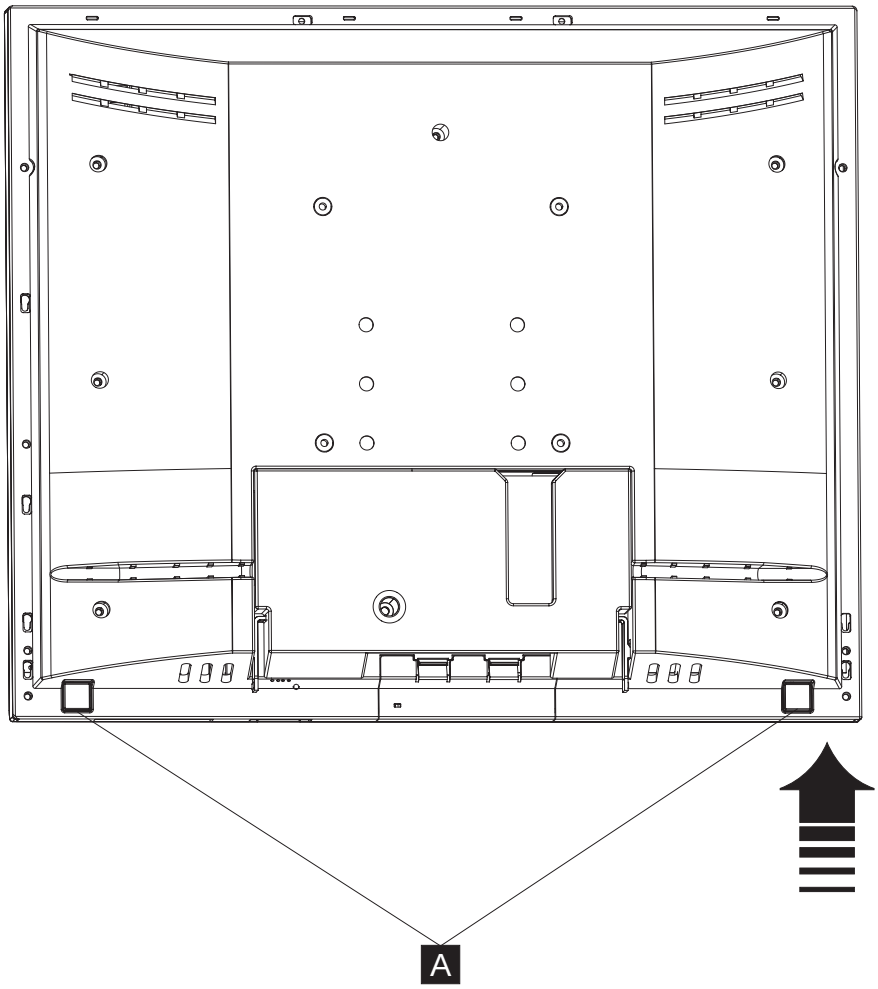


Figure 29. Bezel buttons

5. Continue to lift the bezel from the LCD assembly and remove.
6. To replace the front bezel, reverse these procedures and reconnect the touch cable:

   Note: When replacing the front bezel, be sure to align the tabs in the front bezel into the keyways. See **A** in Figure 30 on page 58.

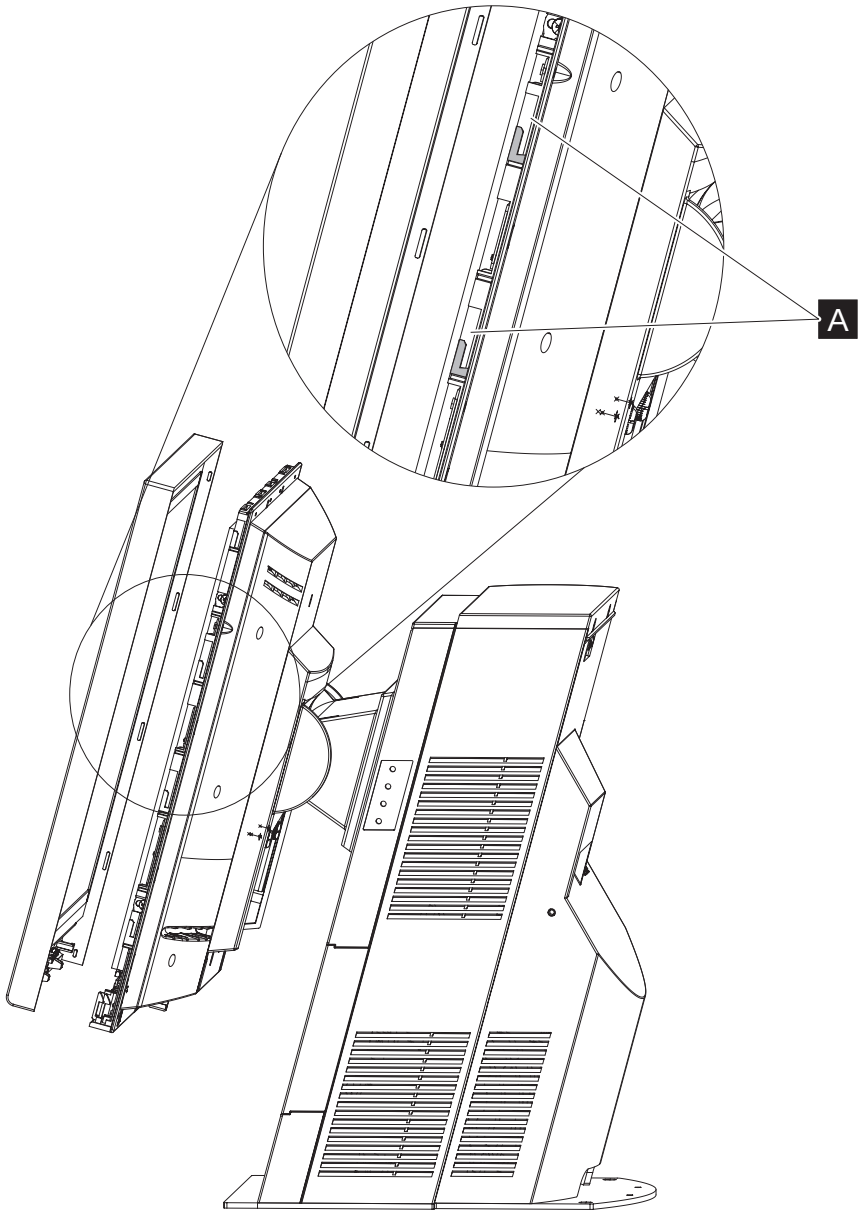


Figure 30. View of L-shaped keyways

Operator card

This section describes how to remove the operator card.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Follow the steps described in “Front bezel assembly” on page 55 to lift off the front bezel.

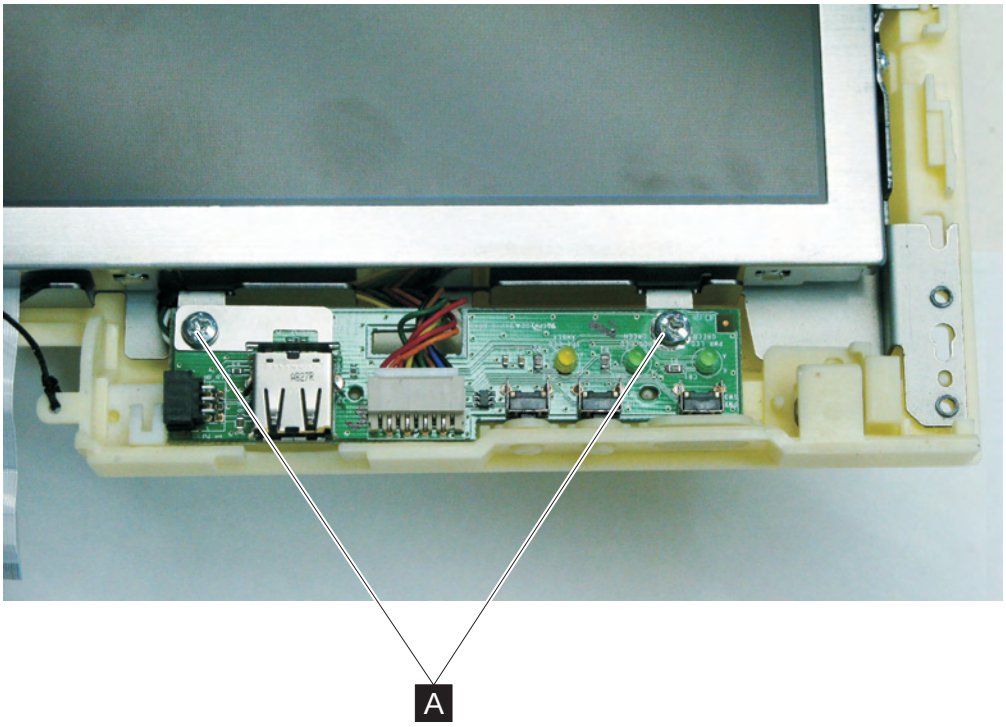


Figure 31. Removing the operator card

3. See Figure 31. Remove the two screws (**A**) and lift out the card.
4. Disconnect both cables from the operator card.
5. To replace, reverse these procedures.

Base plate

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in “Rear cover removal” on page 35.
3. Open the cable tie bar and disconnect all of the cables.
4. Remove the two screws **A** attaching the base plate to the frame.
5. Slide the tower toward the rear and lift it off the base.

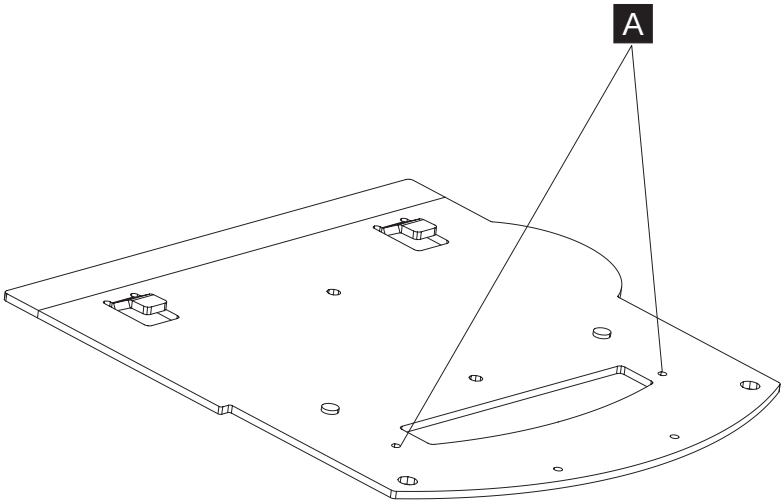


Figure 32. Removing the base plate

Speaker

Note: Speakers are only available on the Premium Model 566 of the SurePOS 500.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in“Rear cover removal” on page 35.
3. Remove the power supply as described in “Power supply” on page 46.
4. Disconnect the speaker cable from the system board.
5. Remove the grounding shield (**B** in Figure 33) by loosening the screw that secures it to the bottom of the system unit.
6. Lift up on the two tabs (**A** in Figure 33) and pull back to remove the speaker. If a thumbscrew is present on speaker, loosen the thumbscrew before lifting tabs.
7. To replace, reverse these procedures.

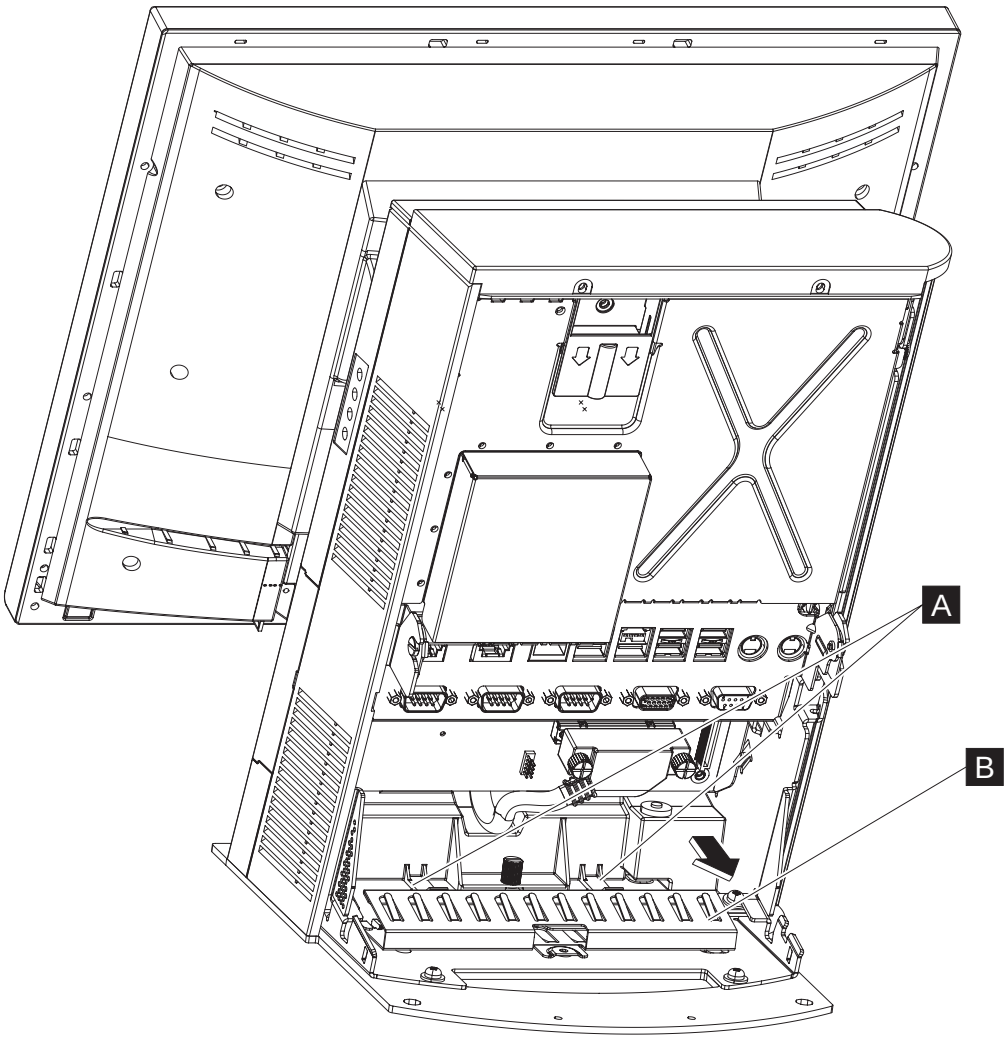


Figure 33. Speaker

Main Cover and Hinge

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the PC Card cover as described in “PC card slot cover” on page 68.
3. Remove the front cover of the unit by lifting up on the door and squeezing the tabs to release cover from unit.
4. Remove the rear cover as described in“Rear cover removal” on page 35.
5. Remove the top cover as described in “Top cover removal” on page 37.
6. Remove hinge cover by pulling the sides of the cover and lifting upward. See **A** in Figure 34.

Figure 34. Hinge cover

7. Remove the main cover by lifting up and pulling sides away from the unit. See **B** in Figure 35.

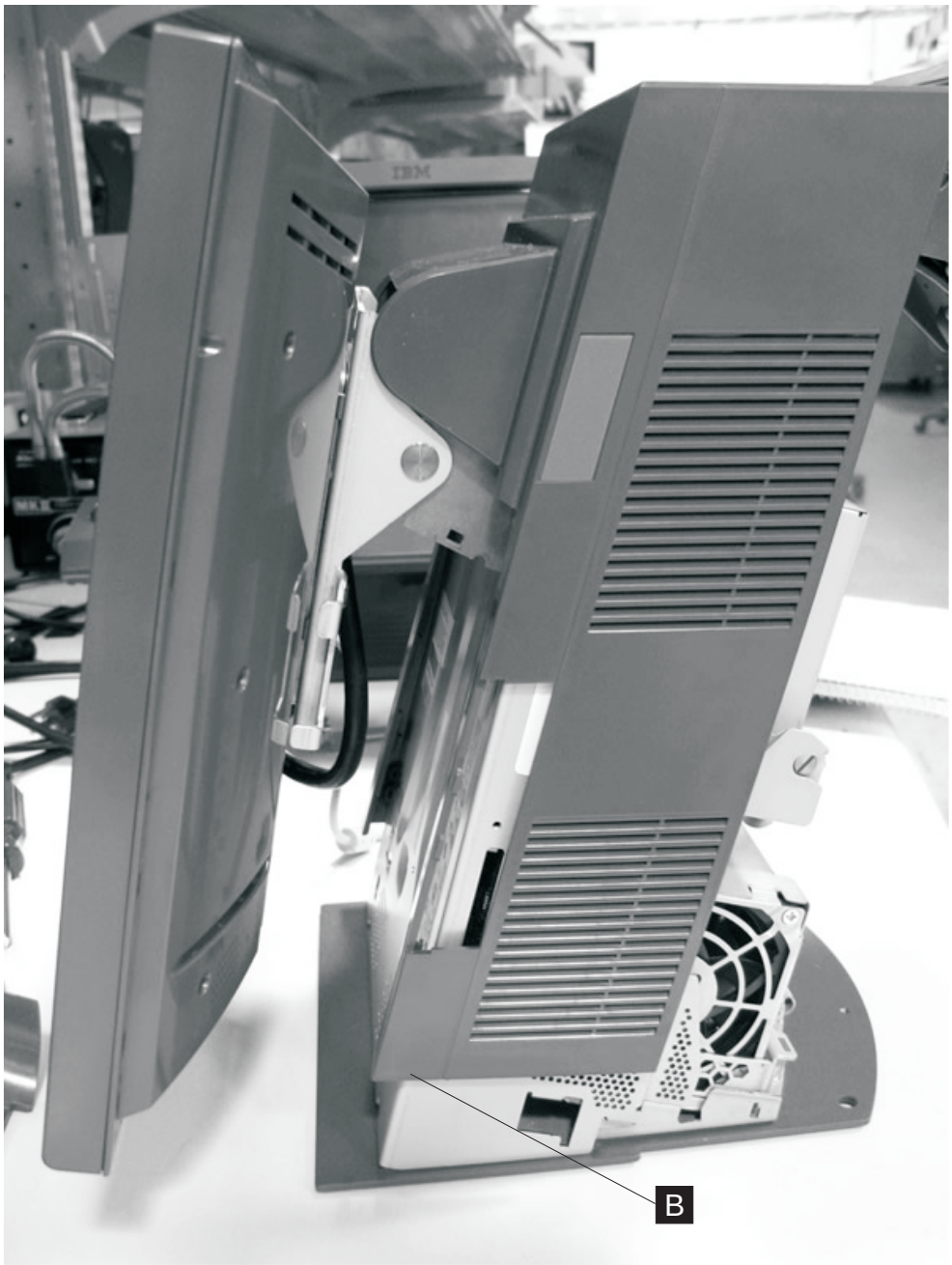


Figure 35. Main cover

8. Remove the tablet as described in “Display tablet” on page 52.

9. Remove the hinge by removing the screws securing it to the unit. See **C** in Figure 36.

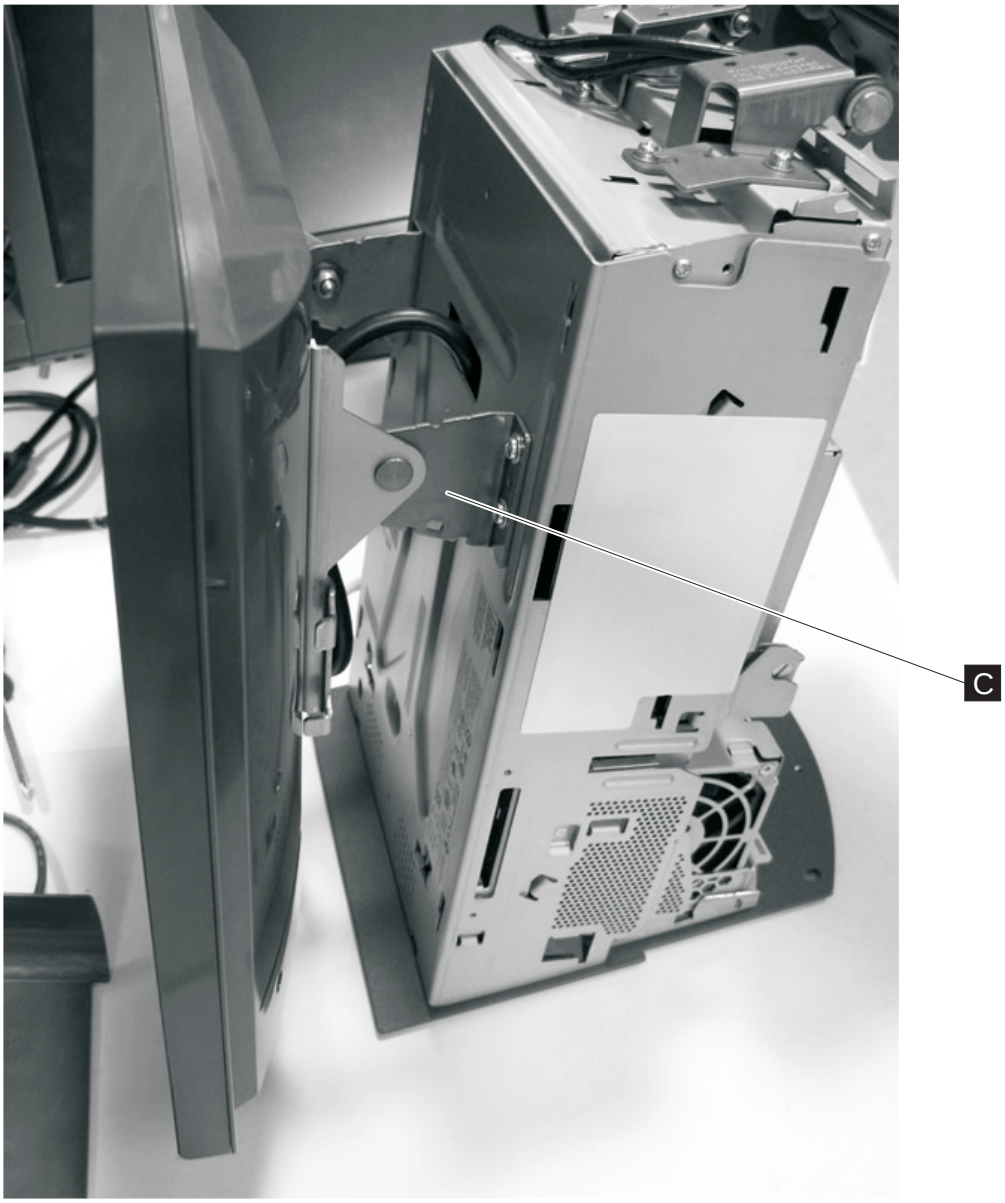


Figure 36. Hinge

10. To replace, reverse these procedures.

Optional features

This section describes how to remove and replace the optional features.

Magnetic stripe reader (MSR)

Note: The magnetic stripe reader can only mount to the right side of the display.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Unplug the MSR cable **A**, as shown in Figure 37 and remove the cable from the cable groove **B**.
3. Remove the thumbscrew **C** that secures the MSR.
4. Remove the MSR **D** from the display by lifting upward and then away from the display.

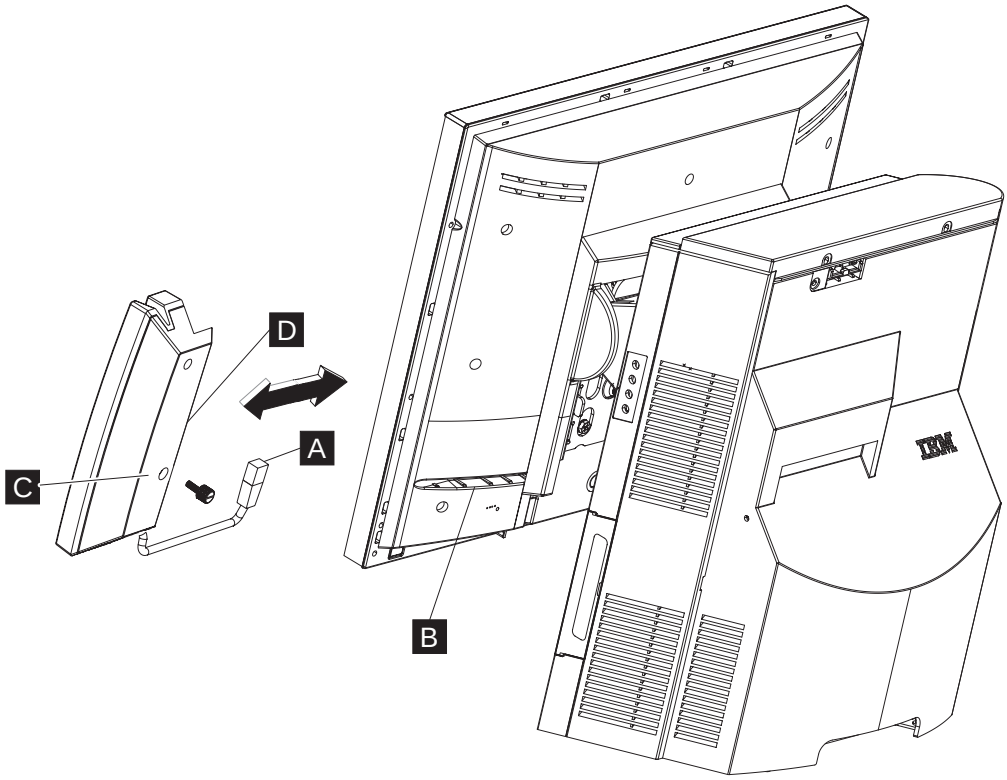


Figure 37. Removing the MSR

To replace the MSR, reverse this procedure.

After installation, run the diagnostics to ensure that the MSR operates correctly. See “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21.

Biometric fingerprint reader

Note: The bracket for the biometric fingerprint reader can be reversed to allow the device to mount to the right or left side of the display. To reverse the bracket:

- Remove the screws that secure the bracket to the fingerprint reader.
- Remove the bracket from the back of the fingerprint reader.
- Reverse the bracket so that it can be mounted in the opposite direction.
- Reattach the bracket with the screws.

Only mount on the right side of the display if there is no MSR installed.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Unplug the biometric fingerprint reader cable and remove the cable from the cable groove.
3. Remove the thumbscrew **B** that secures the biometric fingerprint reader.
4. Remove the biometric fingerprint reader **A** from the display by lifting upward and then away from the display.

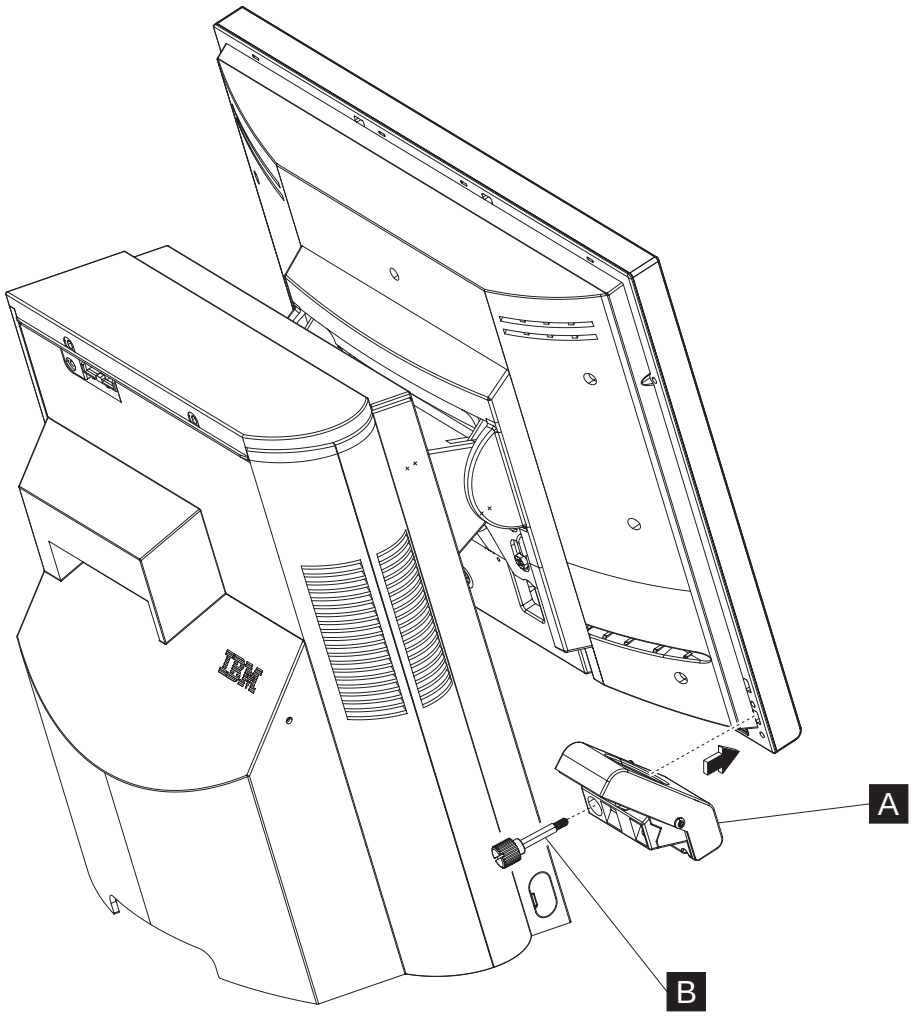


Figure 38. Removing the biometric fingerprint reader

To replace the biometric fingerprint reader, reverse this procedure.

After installation, run the diagnostics to ensure that the biometric fingerprint reader operates correctly. See “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21.

PC card slot cover

Note: The PC Express Slot is only available on the Premium Model 566 of the SurePOS 500

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Bow door away from unit in the center by using the slot on the front of the door and then slide the door toward the front of the unit as shown in Figure 39.

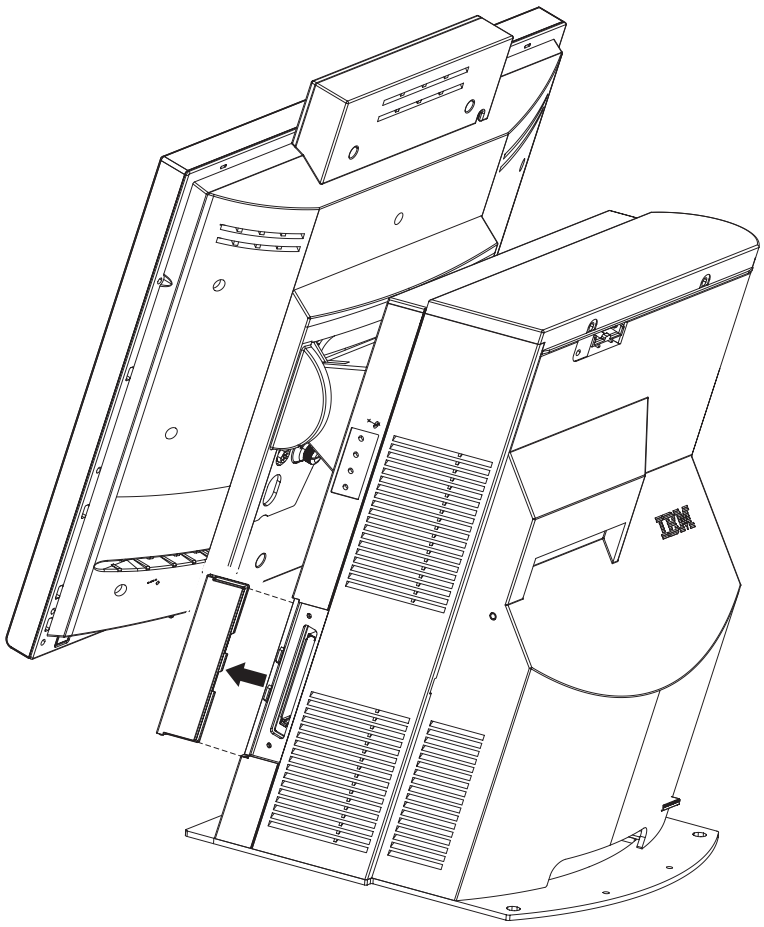


Figure 39. Removing the PC card cover

PC card

Note: This option is only available on the Premium Model 566 of the SurePOS 500

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the PC card cover as shown in Figure 39.
3. If a wireless LAN antenna cover is present, remove the two screws, as shown in Figure 40 on page 69.
4. Press the card in and release. Do not pull the interface cable to remove the adapter card and connector. Gently pull on the adapter card.

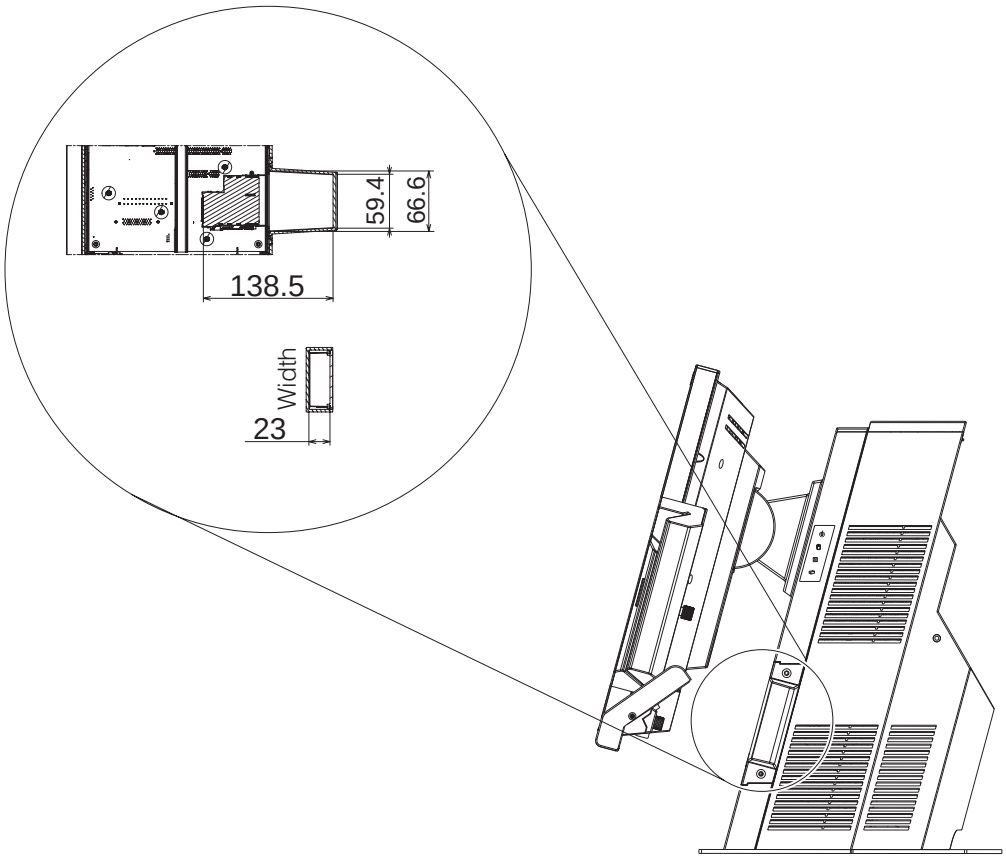


Figure 40. Removing a PC card adapter

5. To replace, reverse these procedures.

PC Card Cover

A two part cover, **A** in Figure 41, is provided for thick PC Express cards and for cards that have cabling. The cover can be assembled and then slid over most cards.

Figure 41. PC Card Cover

For extra thick cards, the cover has to be assembled around the card after the card is installed. For cards with cables, route cable through slot in bottom and assemble door onto cover. The screws can be installed afterwards. See Figure 42 on page 71 for an illustration.

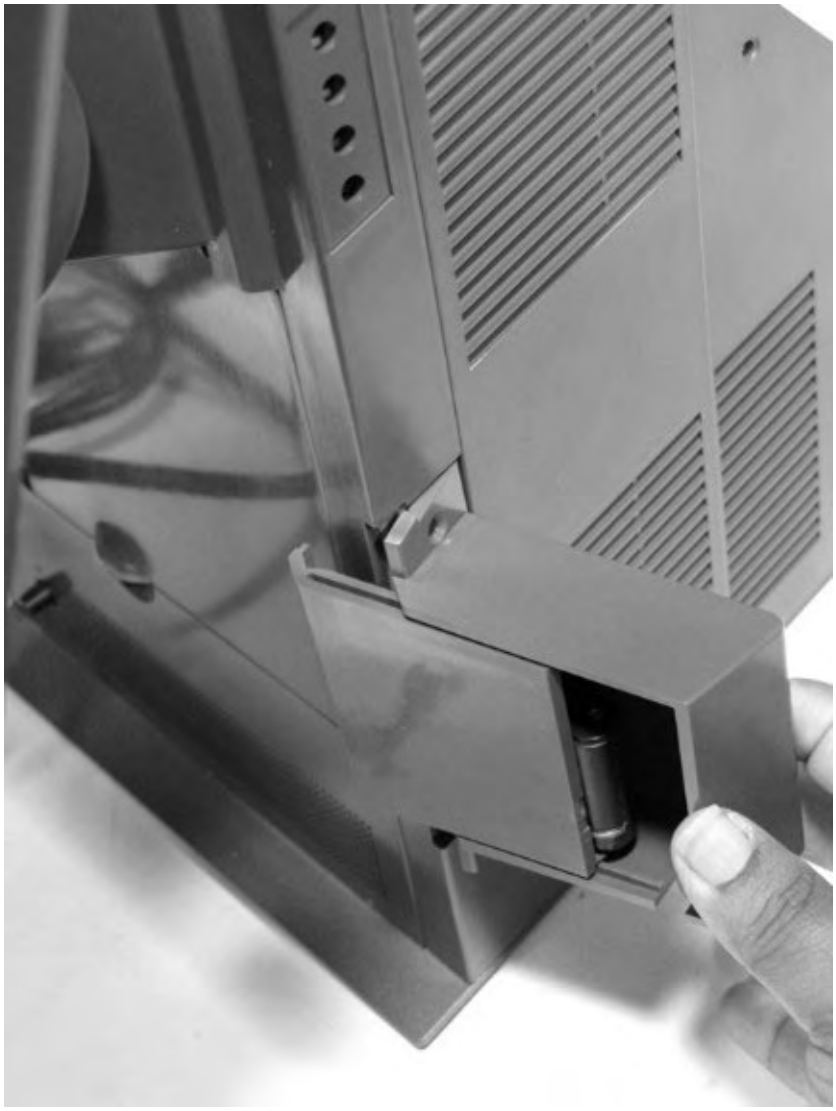


Figure 42. Thick PC Express Card

Note: Before removing a PC card with the system unit running Windows, IBM recommends that you stop the PC card in Windows before you physically remove it.

For information about defining the PC card to the system, see “Using the CMOS Setup Utility” on page 19. After installation, run the diagnostics to ensure that the PC card operates correctly. See “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21.

Vacuum fluorescent display (VFD)

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover. See “Rear cover removal” on page 35.
3. Open the I/O tailgate cover by pushing down and pulling back on the latch lowering the cover.

   Note: You do not need to remove the tailgate cover.
4. Lower the hard disk drive by loosening the thumbscrew and pulling the hard disk drive downward.
5. Remove the existing integrated display or top cover. See “Top cover removal” on page 37.
6. Disconnect the integrated display cable from the rear of the system board below the memory.

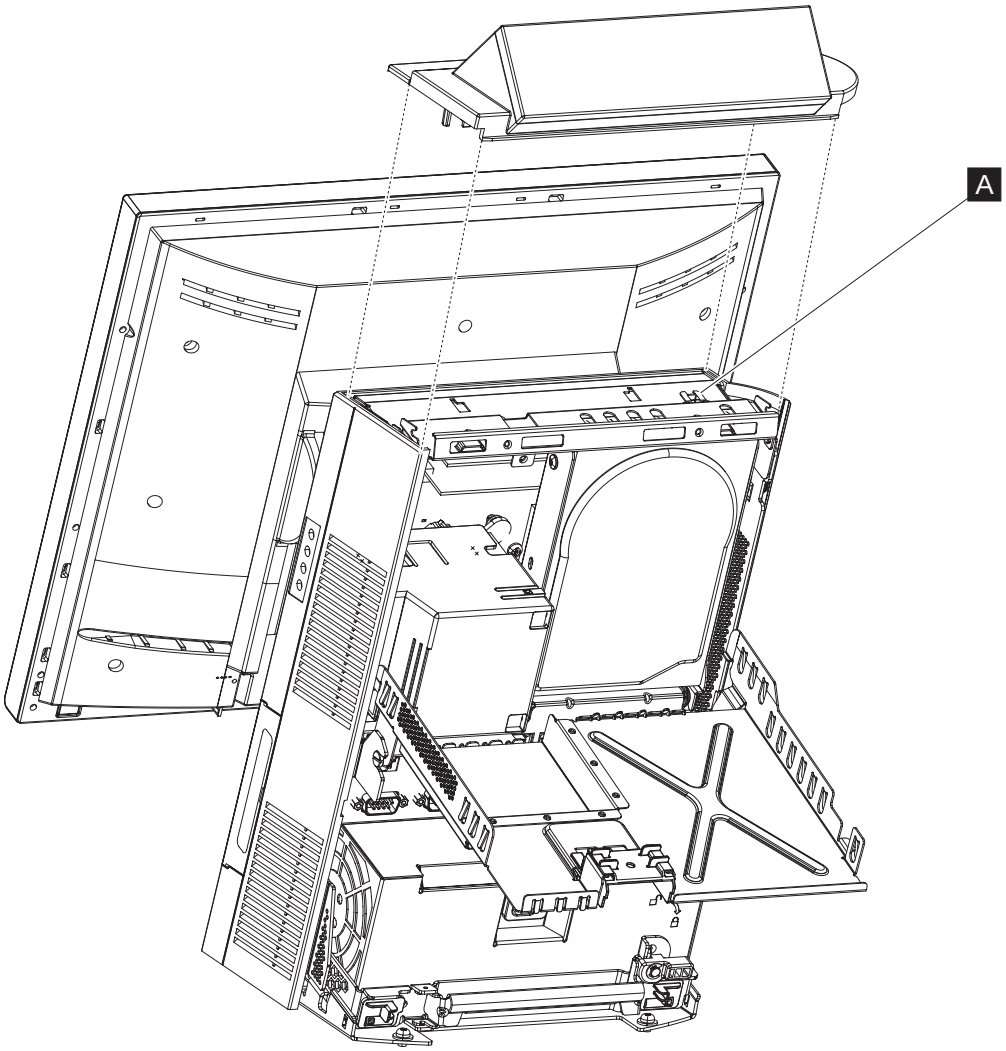


Figure 43. Removing the integrated display

7. Route the cable through the hole in the top of the unit **A** in Figure 43.
8. Snap cable into the plastic grommet.

9. Connect the integrated display cable to the rear of the system board below the memory.
10. Close the hard drive.
11. Close the hard disk drive and secure with the thumbscrew.
12. Close the I/O tailgate cover and replace the rear cover.

After installation, run the diagnostics to ensure that the integrated display operates correctly. See “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21.

4820 display

The 4820 mounting kit includes the following:

- Top hinge cover for the 4820
- Bottom hinge cover for the 4820
- Bracket for the 4820 display

The 4820 can be mounted to the base of the standard unit.

1. Switch OFF the power at the SurePOS 500.
2. Remove the SurePOS 500 rear cover (see “Rear cover removal” on page 35) to access the SurePOS 500 rear connector panel.
3. Install 4820 display bracket on the rear of the 4820 display **E** in Figure 44.
4. Connect the two cables in the appropriate connectors located on the rear of the 4820 display.
5. Attach the 4820 display (**F**) to the bracket (**B**) in any of the three positions available. Tighten the 2 thumbscrews to secure in place.

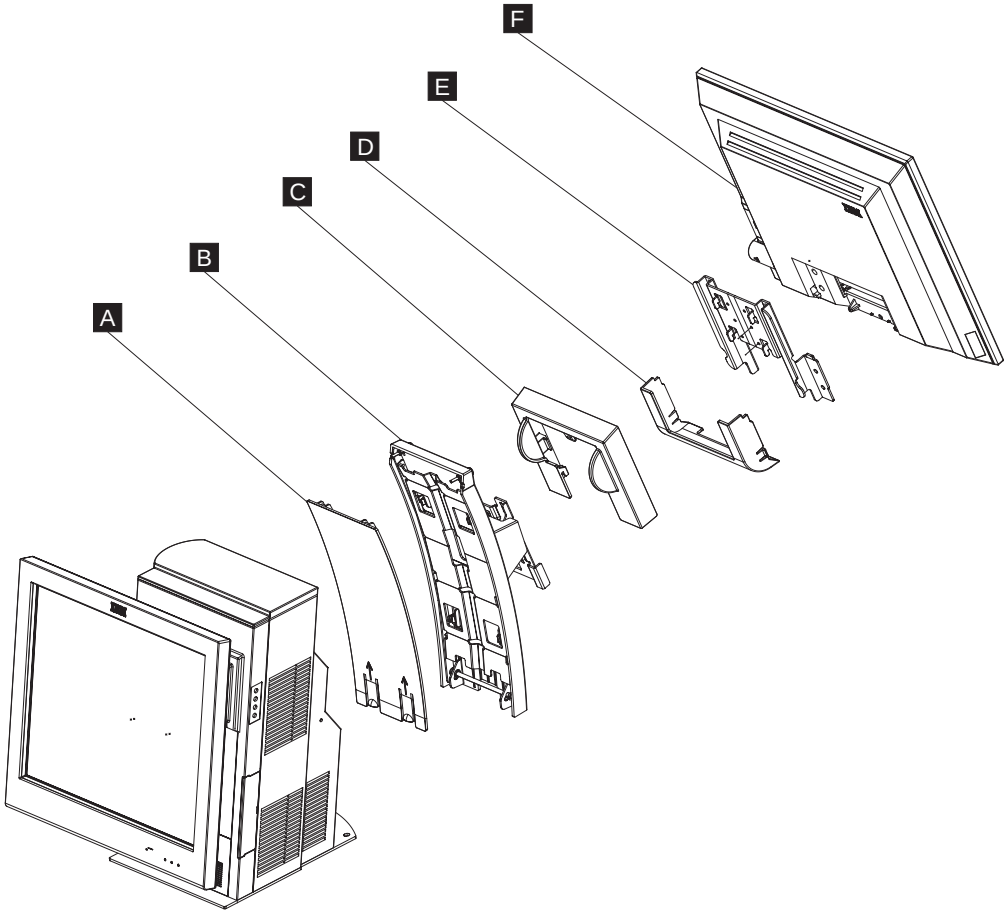


Figure 44. Attaching the 4820 SurePoint Solution display to the mounting foot

6. Remove the back cover of the 4820 mounting bracket **A** by lifting the two tabs and sliding the cover up. Then lift it off.
7. Route the cables through the hole in front of bracket. Then pull down the center backside of the bracket.

8. Continue routing the cables to the rear connector panel of the SurePOS 500, passing it under the cable tie bar, and plug it into the appropriate tailgate ports.
9. Replace the back cover of the 4820 mounting bracket by sliding it on the two tabs until it snaps in place. The cover may have to be pushed down in the center to help it slide toward the bottom of the bracket until it snaps into place.
10. Attach the 4820 mounting bracket to the mounting foot of the SurePOS 500 unit using two screws.
11. Install the cable cover (**D**).
12. Install the hinge cover (**C**).
13. Replace the rear cover of the system unit.
14. Remove thin covers over the two holes in the rear of the top cover with a small screwdriver.
15. Tighten the two thumbscrews to the top of bracket securing it to the rear of the SurePOS 500 unit.
16. Power ON the system unit and the 4820 display.

4820 display positions

The 4820 display can be mounted in three different positions. The top hooks on the bracket mounted to the back of the 4820 fit into one of the following three positions:

- Top, **A** in Figure 45.
- Middle, **B** in Figure 45.
- Bottom, **C** in Figure 45.

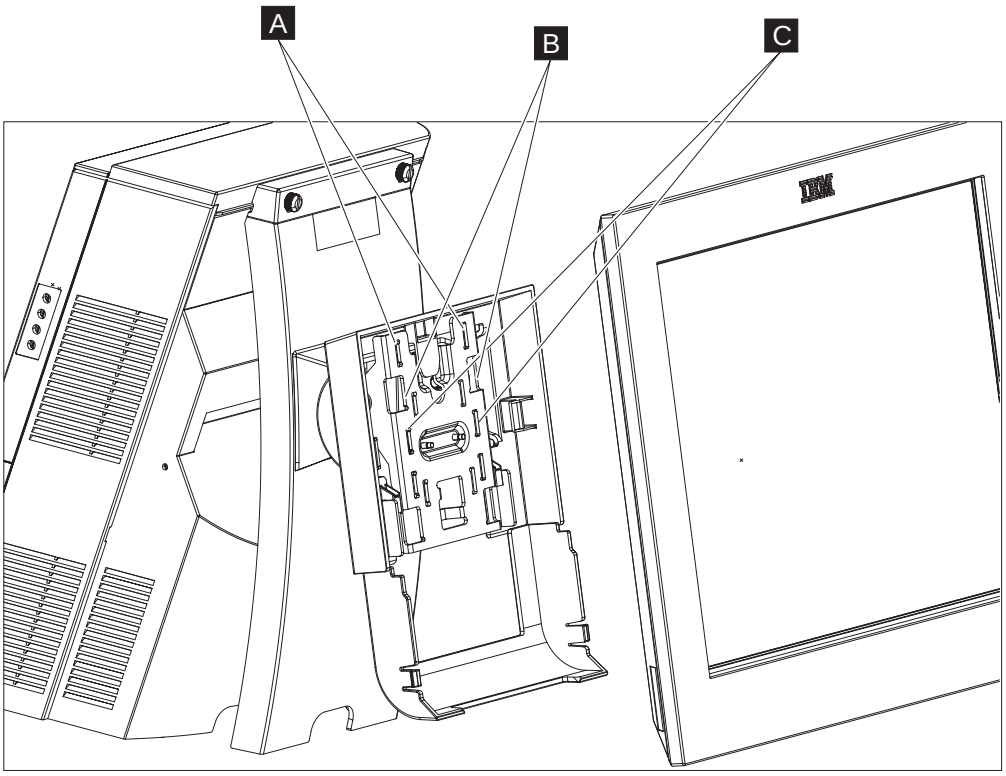


Figure 45. 4820 mounting positions

6.5 display

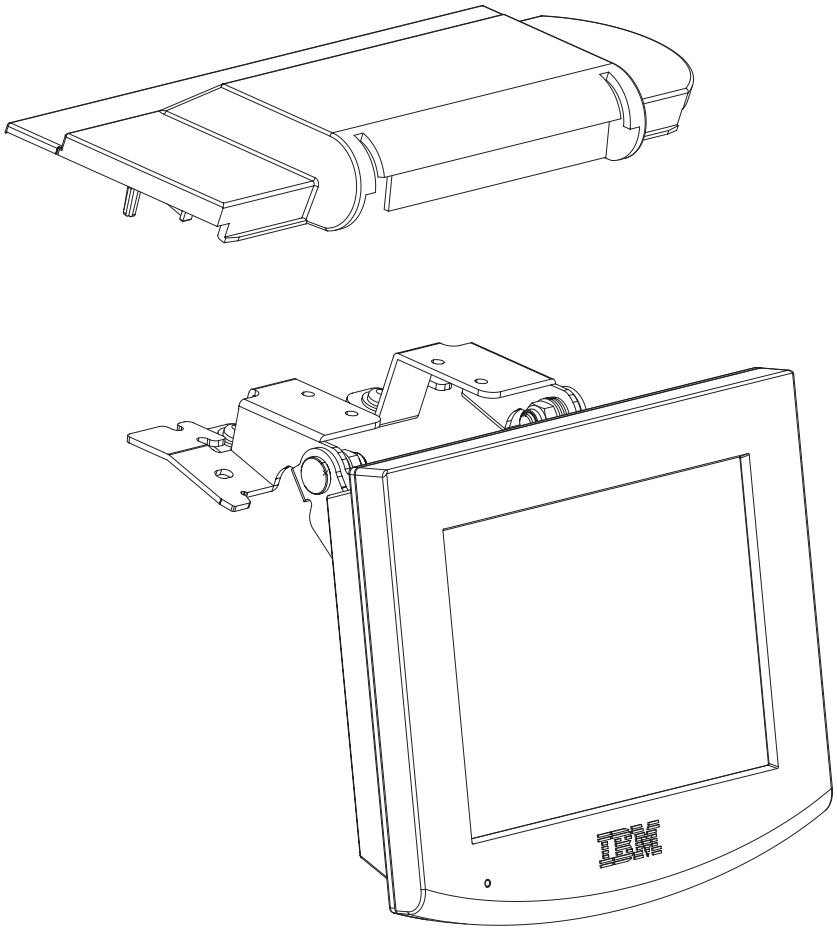


Figure 46. 6.5 display

The 6.5 mounting kit includes the following:

- 6.5 Display mounting bracket
- Video cable
- Power cable
- Top cover

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover. See “Rear cover removal” on page 35.
3. Open the I/O tailgate cover by pushing down and pulling back on the latch lowering the cover.

   Note: You do not need to remove the tailgate.
4. Remove the top cover as described in “Top cover removal” on page 37.
5. Install 6.5 display bracket on the rear of the 6.5 display. **B** in Figure 47 on page 78.

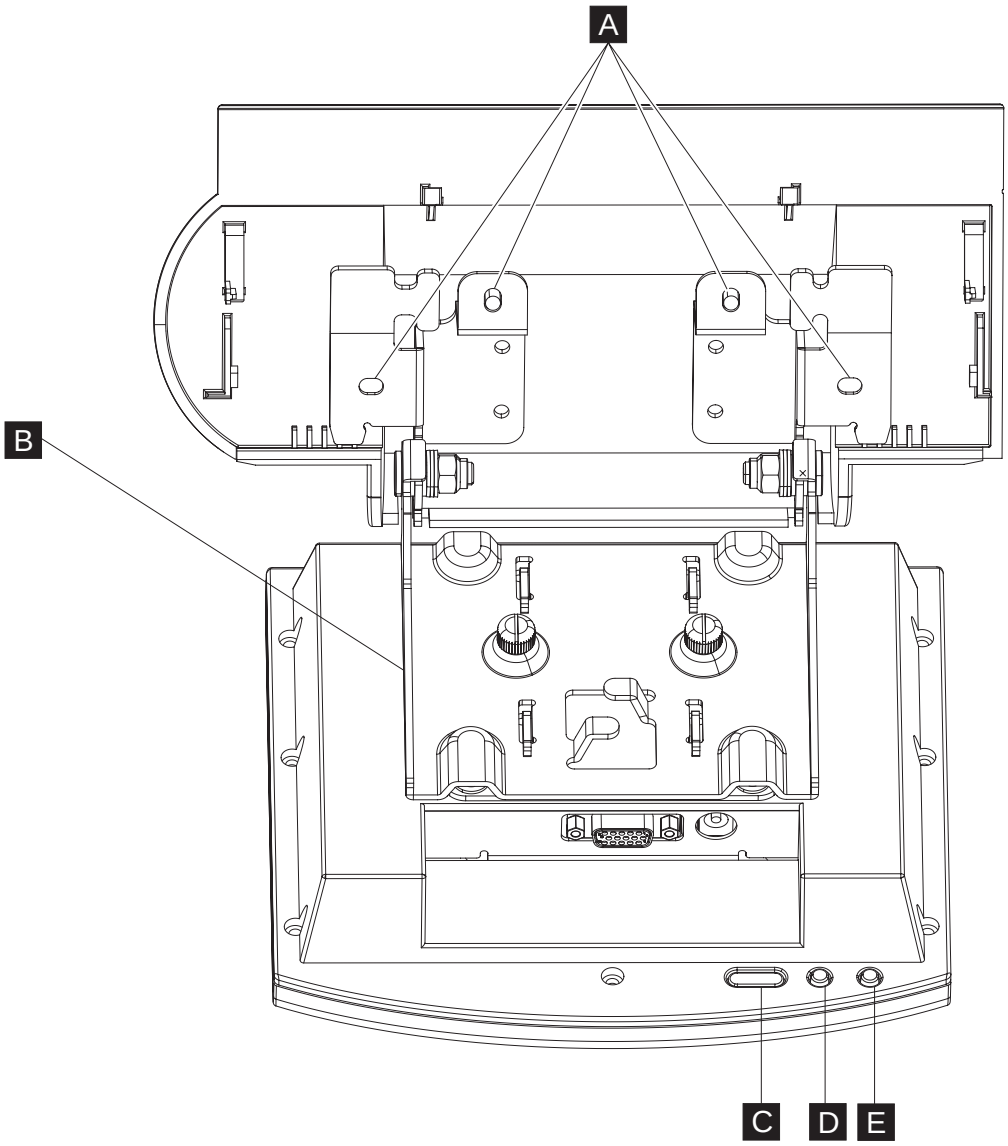


Figure 47. 6.5 bracket

- **A** Four holes to mount 6.5 display to unit.
- **B** Bracket
- **C** Power button
- **D** Brightness increase (+)
- **E** Brightness decrease (-)

6. Connect the two cables in the appropriate connectors located on the rear of the 6.5 display as illustrated in Figure 48.

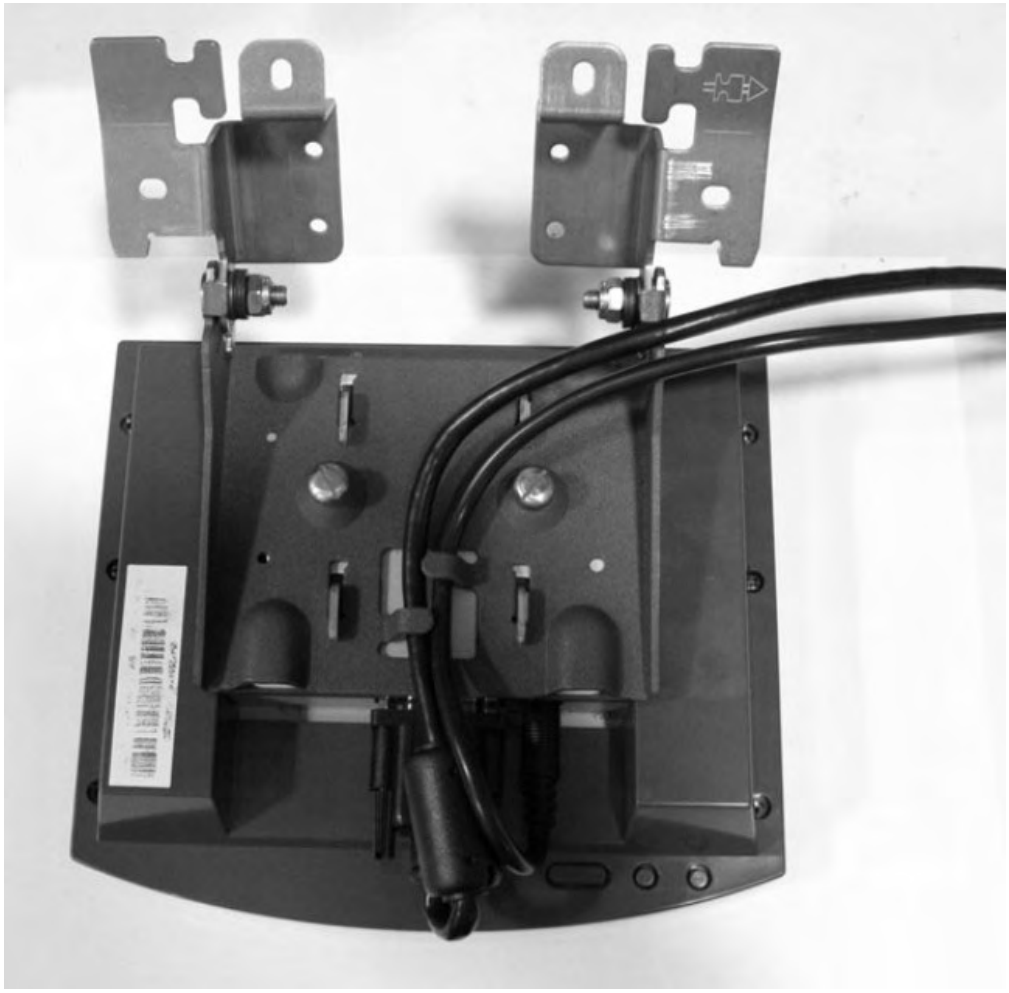


Figure 48. 6.5 cables

7. Mount the 6.5 display bracket to the top of unit with the four screws provided. **A** in Figure 47 on page 78 illustrates the four holes to use. Be sure to position the cables under the hook as illustrated in Figure 49.

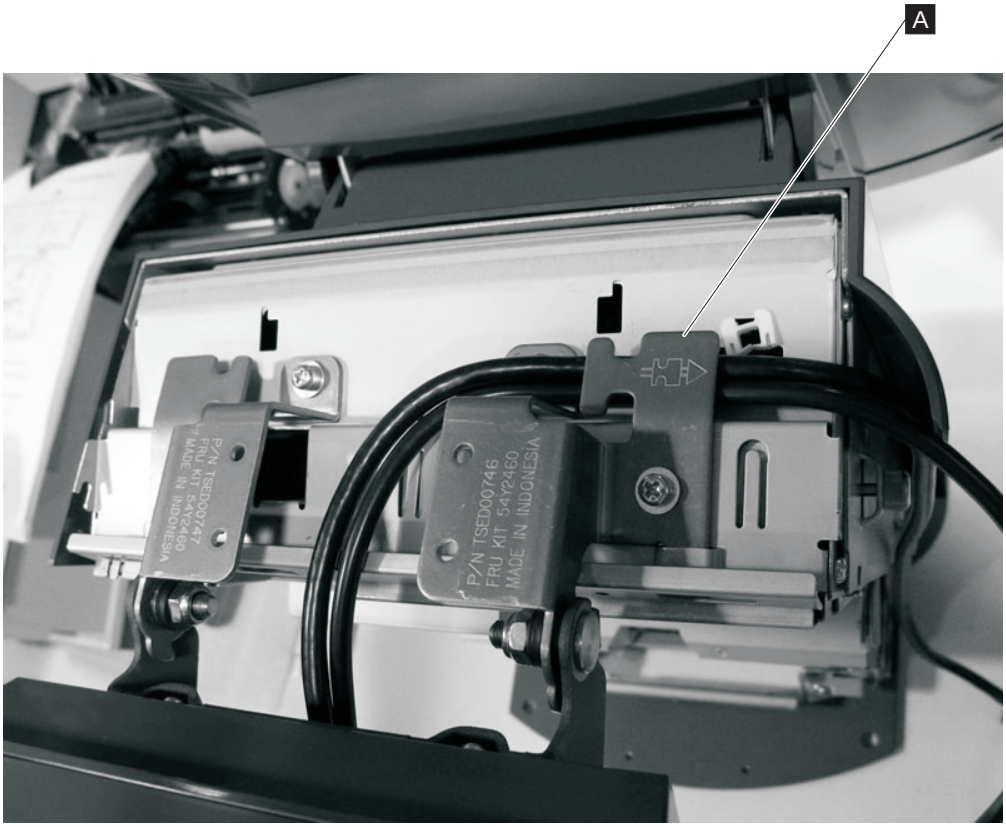


Figure 49. 6.5 cable hook

8. Close the I/O tailgate cover.

9. Route cable down the right side of the unit through the notch. **A** in Figure 50 illustrates the notch.

   Note: A cable tie can be used to hold the cable in place.

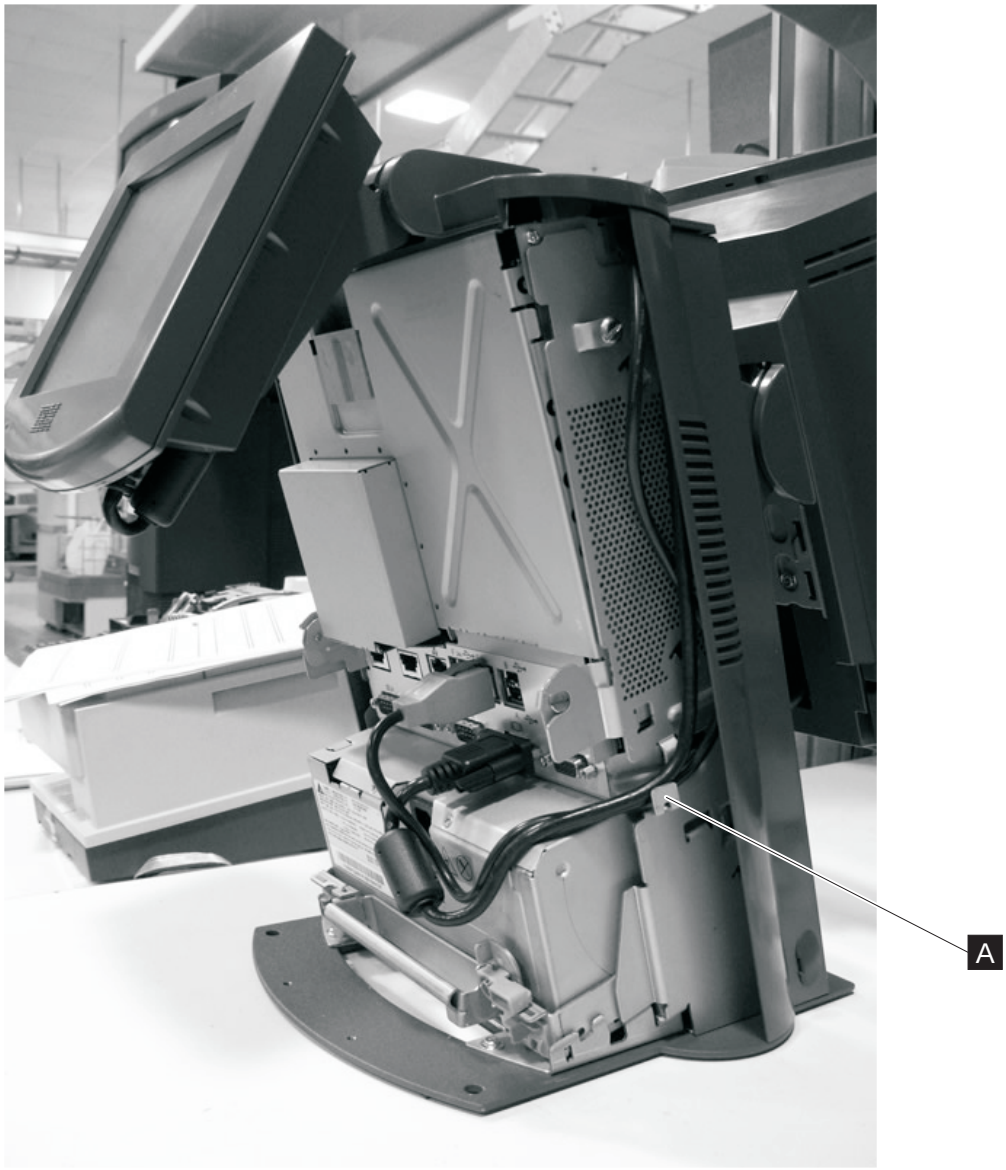


Figure 50. Cable notch

10. Attach the top cover that was part of the 6.5 mounting kit.
11. Lift the 6.5 display up as far as it can go.
12. Replace the rear cover of the system unit.

Payment terminal mount

The terminal mounting kit includes the following:

- standard bracket
- extended bracket
- screws for mounting bracket
- screws for securing unit to system unit (short set, long set)
- screws for securing payment terminal on bracket

Note: The payment terminal mount comes with two types of screws.

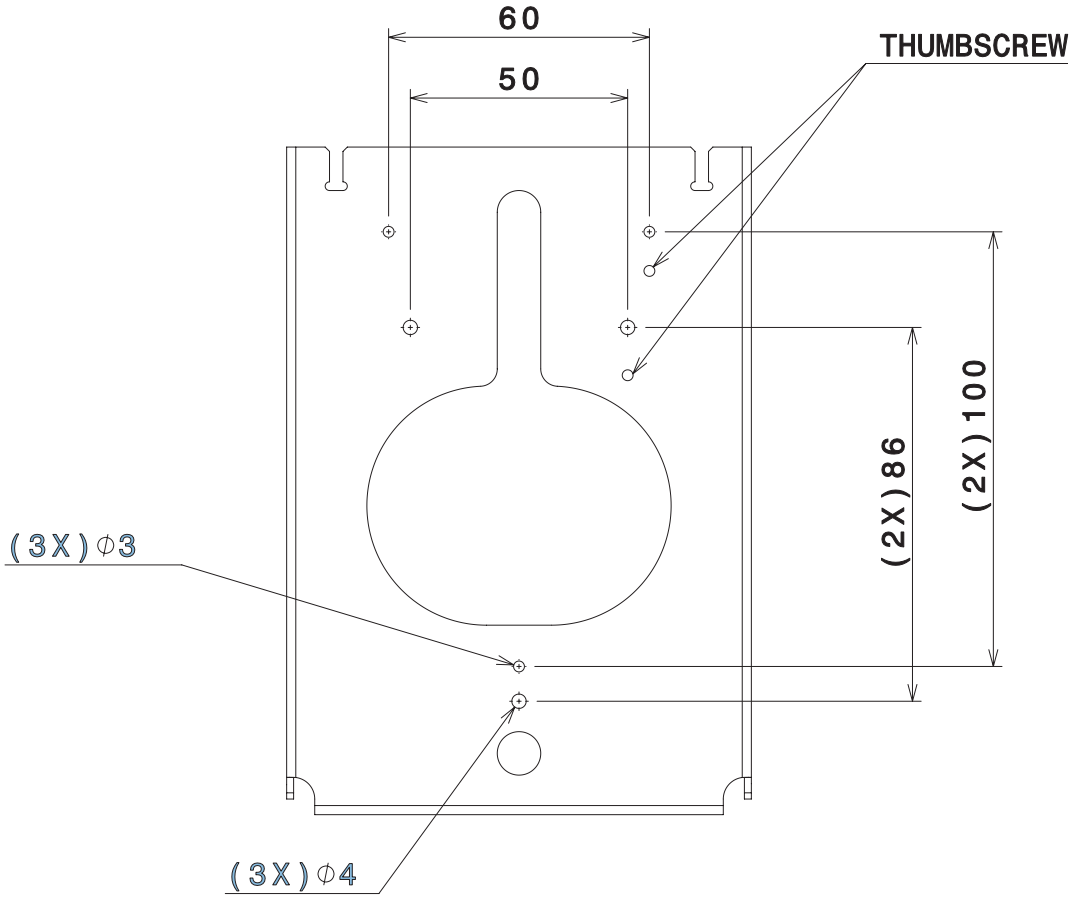


Figure 51. Payment terminal mount

1. Adjust the 3 screws to allow adequate space to slide on the payment terminal device. Select the hole spacing that matches the mounting pattern on the payment terminal to be installed. Install three screws in those holes.
2. Slide the payment terminal device in place.

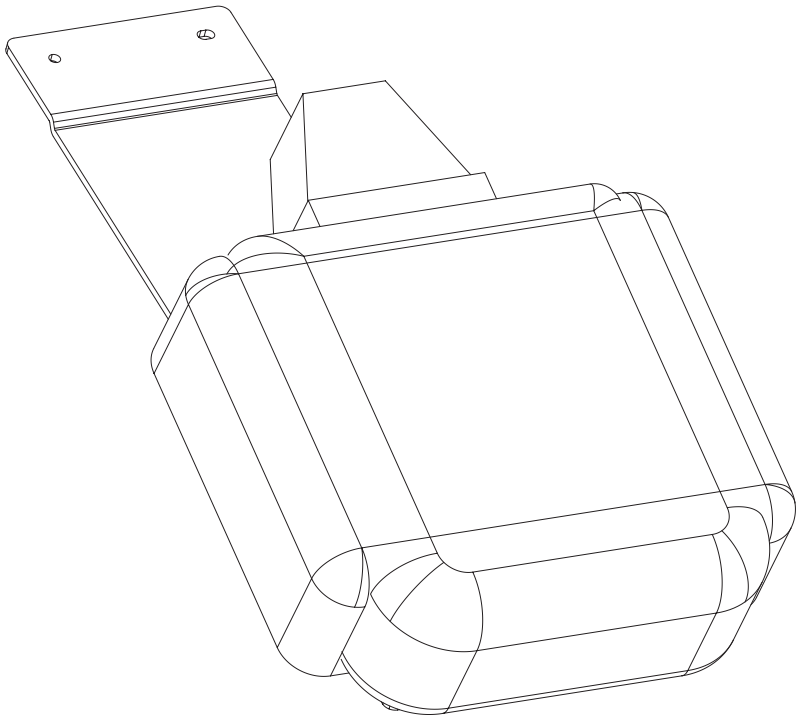


Figure 52. Payment terminal

3. Tighten the thumbscrew to secure the unit in place. See Figure 51 on page 82.
4. Remove the rear cover of the SurePOS 500 system.
5. Secure the payment terminal mount to the bottom of the SurePOS 500 system with two screws.
6. Route cables through cable tie bar and plug into the appropriate slot on the tailgate.
7. Replace rear cover of the system unit.

The payment terminal device has the following features:

1. A screw located on the side of the mounting device that allows the payment device to be tilted.
2. A push button on the mounting device that allows the payment device to slide back and forth.
3. An extender bracket that allows the payment device to be mounted farther from the system unit.

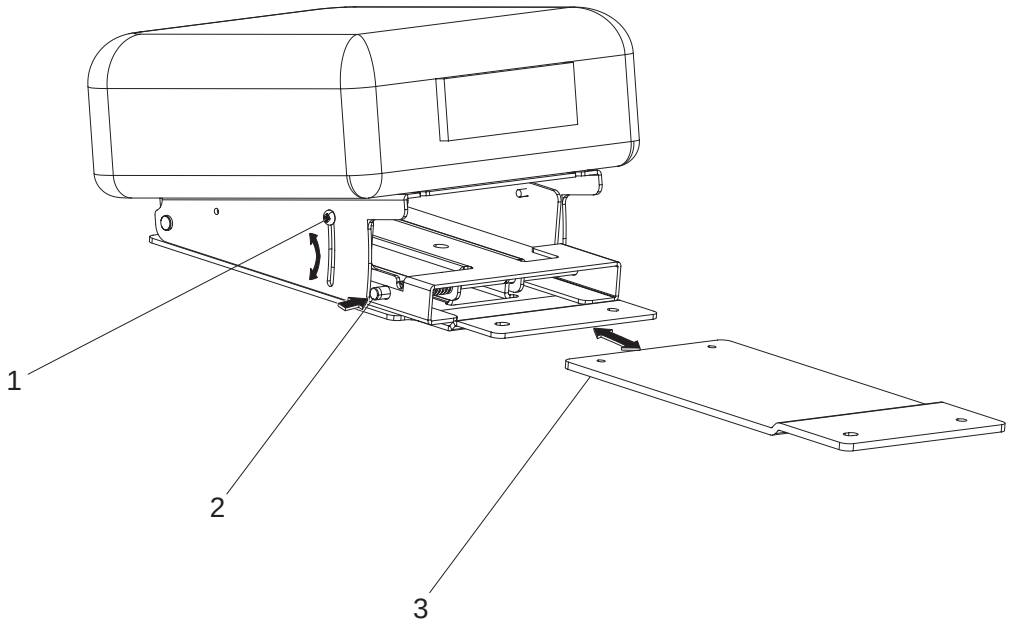


Figure 53. Payment terminal features

How to mount with a 4820 display

Option A

1. Adjust the three screws to allow adequate space to slide on the payment terminal device.
2. Slide the payment terminal device in place.
3. Install and tighten thumbscrew from the underside of the top bracket. Tighten the thumbscrew to secure the unit in place.
4. Remove the rear cover of the SurePOS 500 system.
5. Secure the payment terminal mount to the bottom of the SurePOS 500 system along with the 4820 mounting bracket using longer screws.
6. Route cables through cable tie bar and plug into the appropriate slot on the tailgate.

Option B

1. Adjust the three screws to allow adequate space to slide on the payment terminal device.
2. Slide the payment terminal device in place.
3. Tighten the thumbscrew to secure the unit in place.
4. Remove the rear cover of the SurePOS 500 system.
5. Use short set of screws to extend payment terminal bracket. See Figure 53.
6. Secure the payment terminal mount to the bottom of the SurePOS 500 system along with the 4820 mounting bracket using longer screws.
7. Route cables through cable tie bar and plug into the appropriate slot on the tailgate.
8. Attach the rear cover of the SurePOS 500 system.
9. Secure the 4820 bracket to the rear of the SurePOS 500 system with two thumbscrews.

Installing the wireless adapter enclosure

To install the antenna enclosure to the display unit:

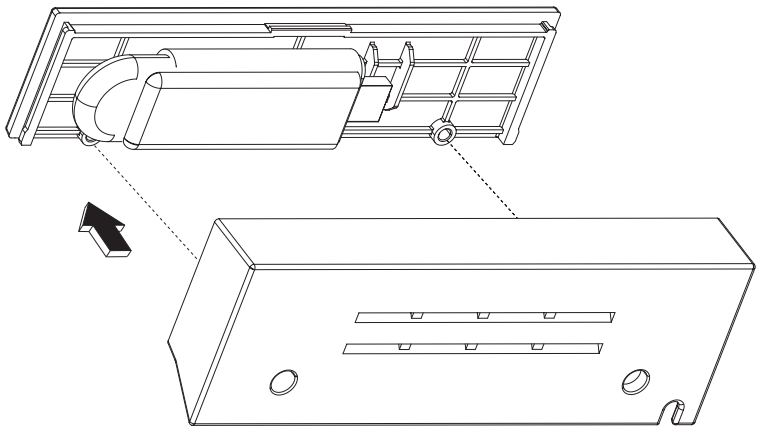


Figure 54. Assembling and installing the wireless adapter

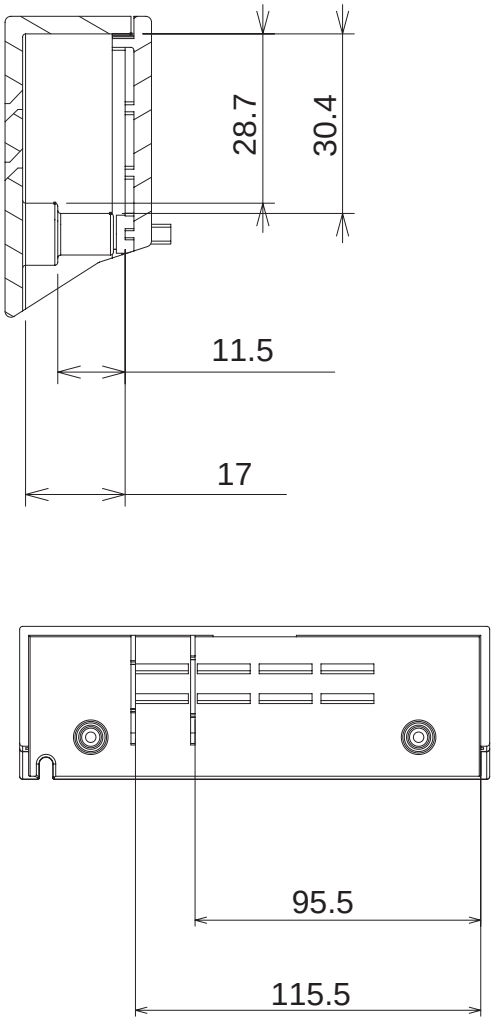


Figure 55. Dongle dimensions

1. First, assemble the antenna enclosure:
   a. With the antenna enclosure face down, place the cable receptacle in the notches provided inside of the enclosure and route the cable to the end of the unit.
   b. Place the wireless adapter into the enclosure and plug into the receptacle.
   c. Slide the back cover on the antenna enclosure. Be careful not to pinch the cable.

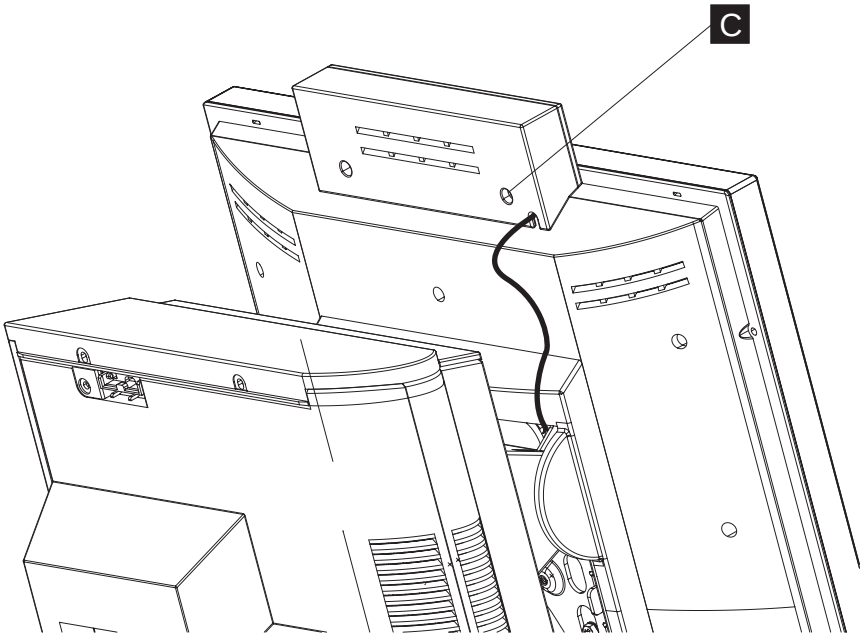


Figure 56. Installing the antenna enclosure

2. Locate the holes on the top of the display and align the bottom of the antenna-enclosure assembly with these holes.
3. See **C** in Figure 56. Insert the two screws into the back of the antenna-enclosure assembly and tighten to fasten the unit to the top of the display.
4. Lift the hinge cover from the display by unsnapping the legs and lifting it up until the end of the USB connector can pass through the gap. See **A** in Figure 34 on page 62.
5. Run the cable down behind the tablet between tablet and hinge cover on tower.
6. Replace the hinge cover on the display. The cable will fit in the notch to the side next to the hinge.
7. Plug the end into one of the USB connectors at the rear tailgate of display.

After installation, run the diagnostics to ensure that the wireless adapter operates correctly. See “Using the IBM Diagnostics for POS Systems and Peripherals package” on page 21.

Modular flash drive

Attention: The modular flash drive is a static-sensitive device. See “Handling static-sensitive devices” on page 30.

1. Switch OFF the power to the SurePOS 500. Unplug the power cord from the external power source.
2. Remove the rear cover as described in “Rear cover removal” on page 35.
3. Unplug the AC power cord on the back of the power supply.
4. Remove the power supply. See “Power supply” on page 46.
5. The modular flash drive **A** is installed on the system board on the lower left side of the panel.

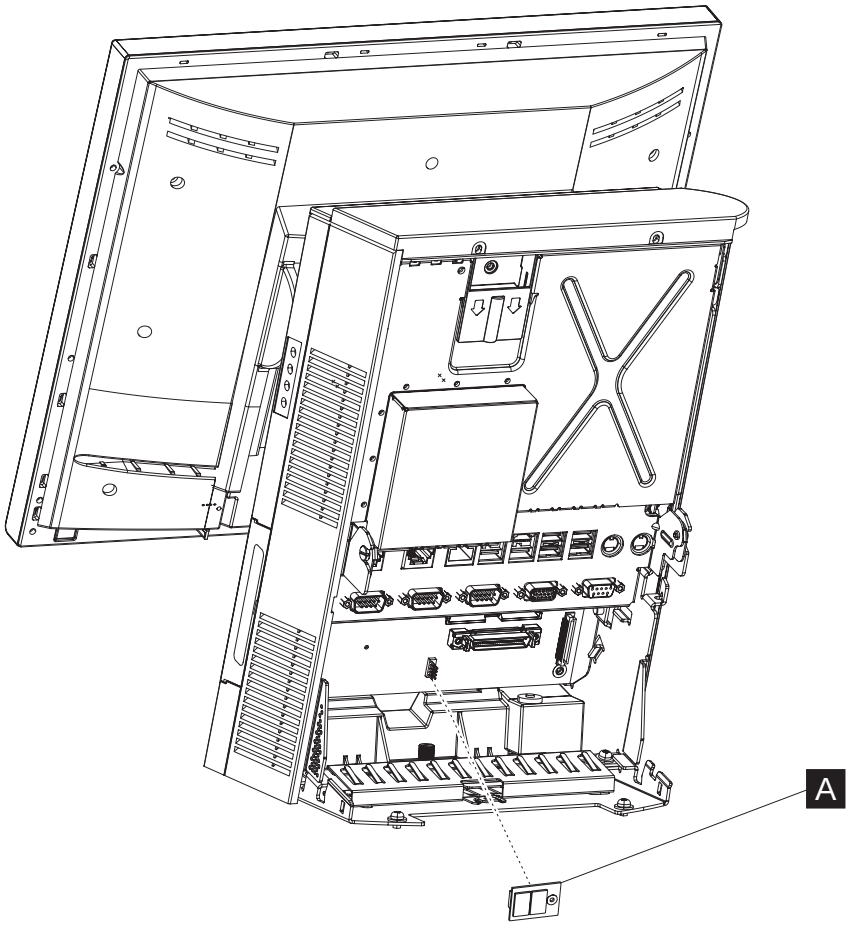


Figure 57. Modular flash drive

6. When removing the flash drive, squeeze the tip of the white plastic stand-off to release the flash drive.
7. Grasp firmly and pull directly back to avoid damaging pins.
8. To replace, reverse these procedures.
9. When installing, make sure to line up the flash drive hole with the standoff and push in to fully seat the connector.

Additional features

The SurePOS 500 Models 526, 566, and E2S have some additional features for security and sign attachments.

Security Screws

There are three places on the SurePOS 500 Models 526, 566, and E2S where security screws can be used. A M3 X 6 screw can be used. These screws are to be provided by the customer.

- Top of plastic latch that opens the I/O tailgate, **A** in Figure 58
- Rear of the system unit, **B** in Figure 58
- Side of power supply to prevent removal, **C** in Figure 58

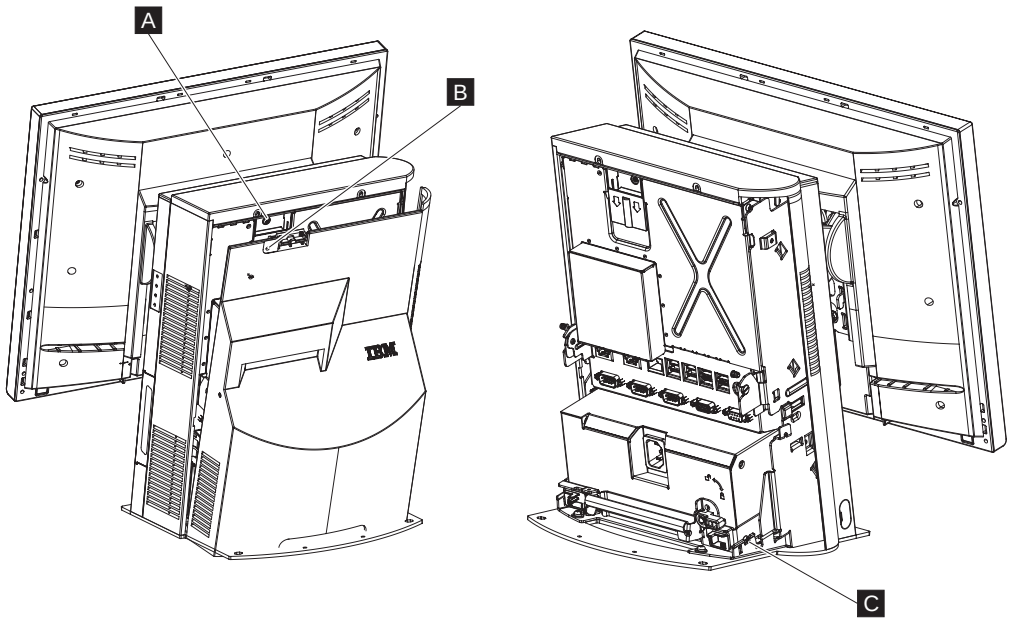


Figure 58. Security screws

Sign attachment

Signs can be attached to the SurePOS 500 Models 526, 566, and E2S in the following places:

- There are four places on the standard display. See **A** in Figure 59 on page 90. A M3 X 8 screw can be used. These screws are to be provided by the customer. See “Display tablet sign point dimensions” on page 134 for dimensional details.

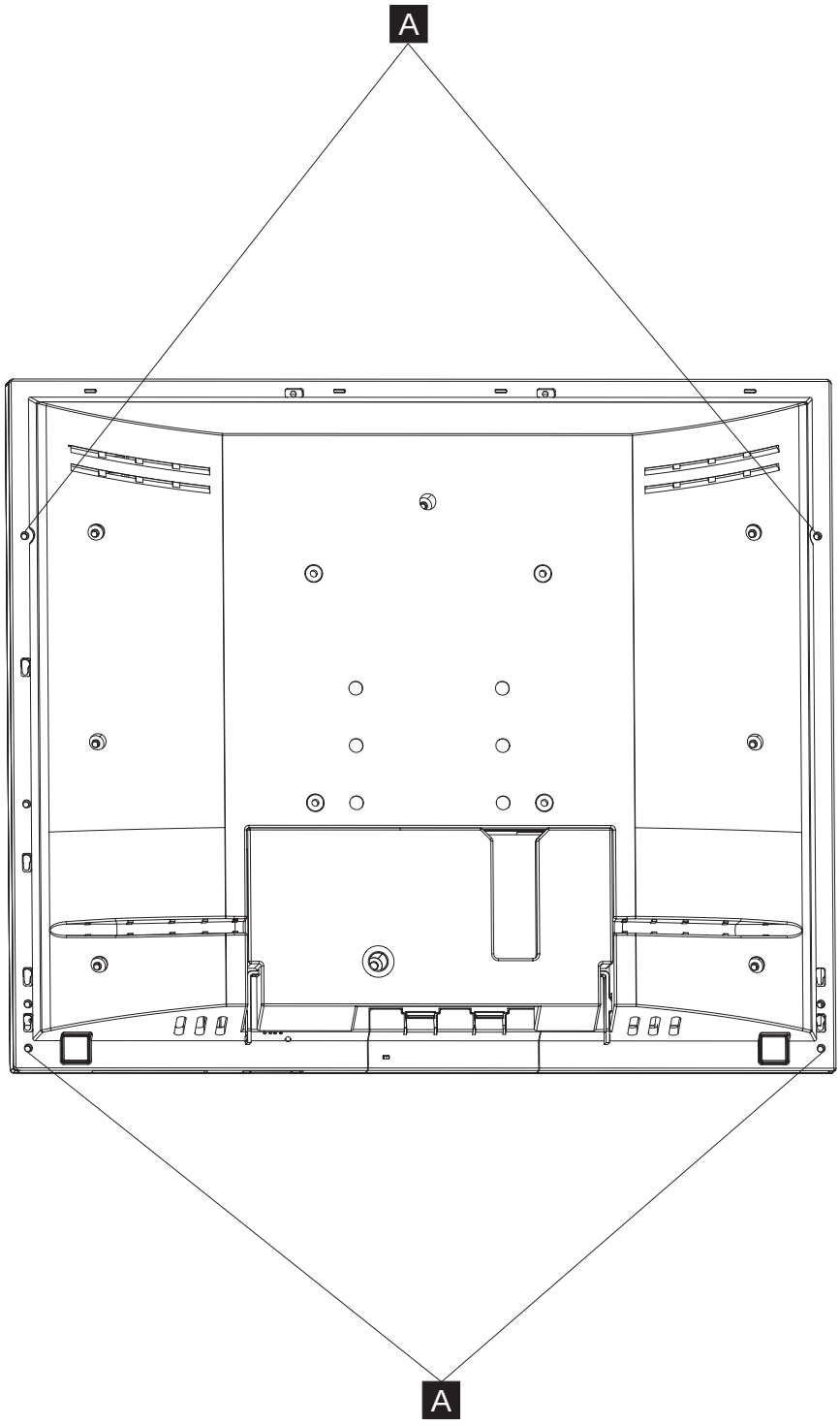


Figure 59. Sign attachment for standard display

- There are four places on the 6.5" display. See **A** in Figure 60. A M3 X 10 screw can be used. These screws are to be provided by the customer. See “6.5 display sign point dimensions” on page 135 for dimensional details.

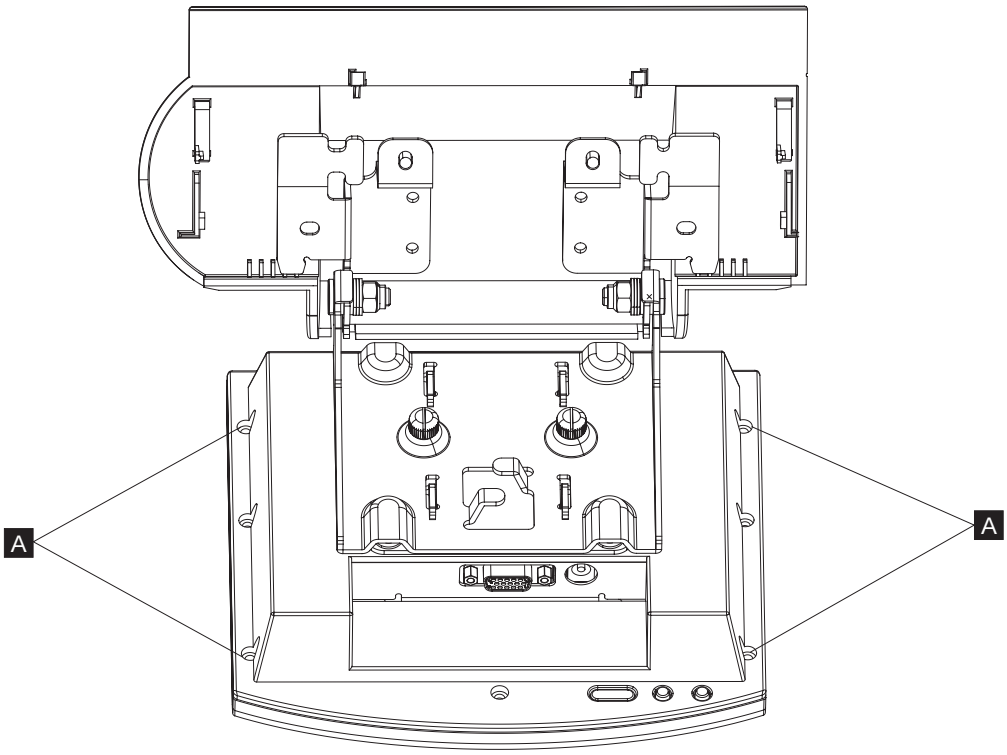


Figure 60. Sign attachment for 6.5 display

- There are two places on the system unit. One is located on each side of the unit. See **A** Figure 61.

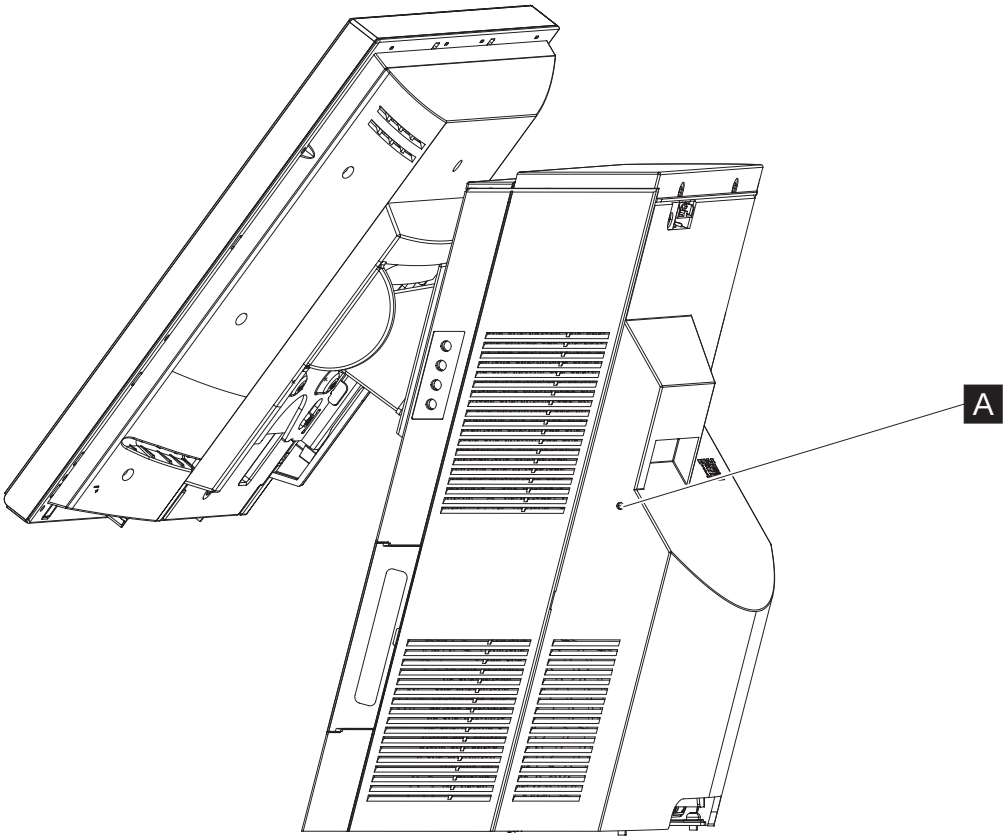


Figure 61. Sign attachment for system unit

Chapter 6. Mounting the SurePOS 500 Models 526, 566, and E2S

Table 13 describes the various mounting configurations of the SurePOS 500.

Note

Figures in this section are representative of the SurePOS 500 family and may have slight differences with the Models 526, 566, and E2S. All mounting procedures are accurate.

Table 13. Mounting configurations

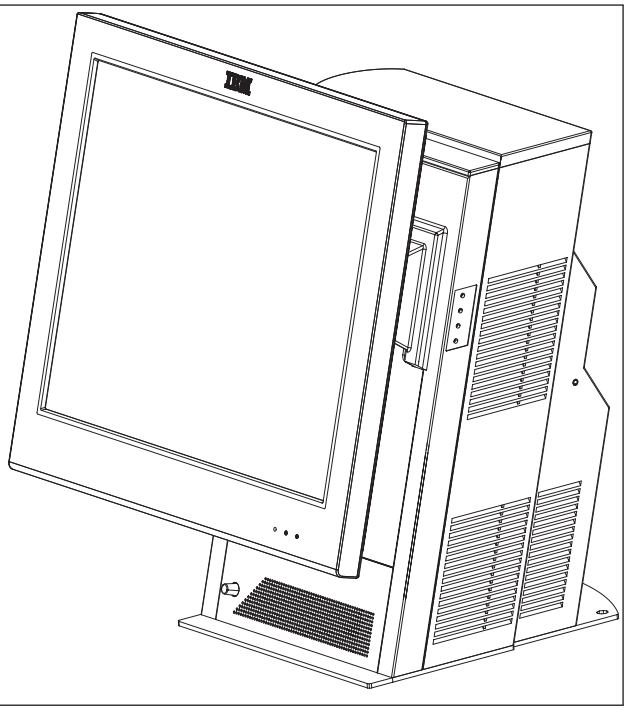
To mount using the base to the countertop, see “Mounting the base plate on a countertop” on page 95.	

Table 13. Mounting configurations (continued)

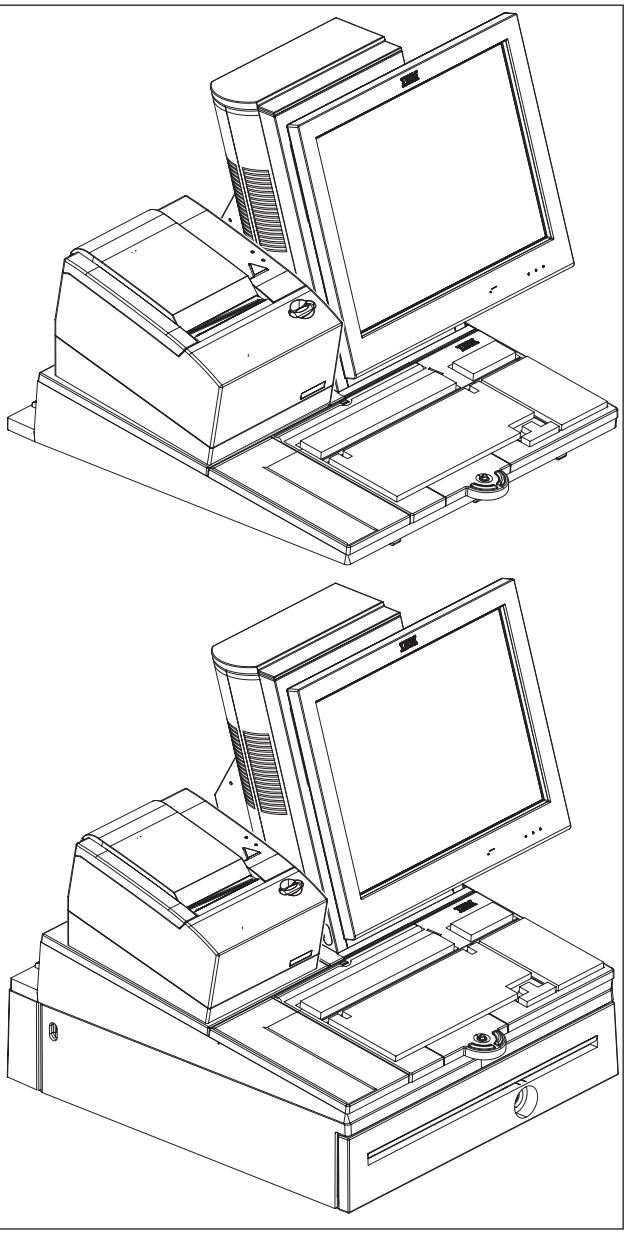
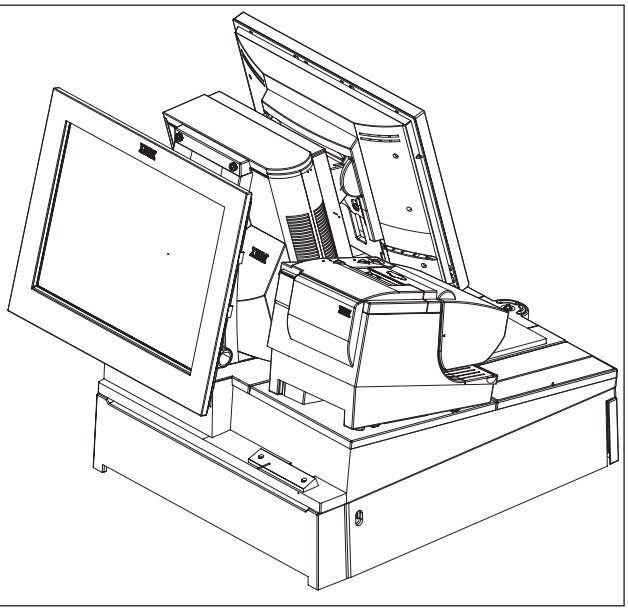
To mount on a countertop or cash drawer using the keyboard-integration tray, see “Countertop and full-size cash drawer” on page 98	

Table 13. Mounting configurations (continued)

To mount with a cash-drawer and keyboard integration tray, integrated character display and 4820 SurePoint Solution options, see “Installing IBM 4820 SurePoint Solution and other external video displays” on page 114	

Before mounting your system, first install any internal and external devices on the unit.

Mounting the base plate on a countertop

You can mount the SurePOS 500 Models 526, 566, and E2S free-standing base plate to a countertop with two mounting screws. If you are routing the cables under the counter, you can use the base plate as a pattern to cut out your counter or use the specific mounting hole and cutout dimensions as shown in Figure 62 on page 96.

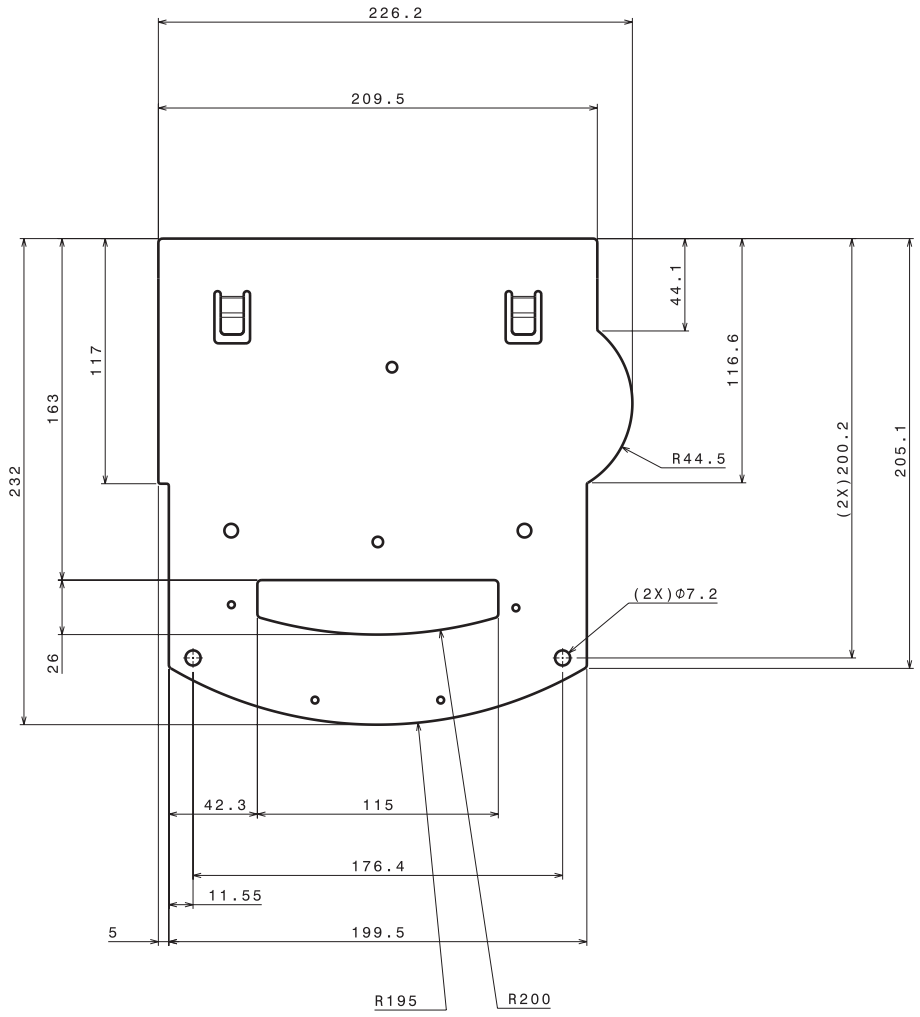


Figure 62. Base plate countertop dimensions

If there is a hole cut in the counter, route all cables (including the AC power cord) through the cable-access hole in the base plate. If you are routing the cables on top of the counter, route all cables out the rear of the system. Lay the cables flat along the countertop.

To mount the system directly on a countertop:

Note: Before you begin, acquire two mounting screws. These are not supplied.

1. Use the SurePOS 500 base plate as a pattern for drilling two mounting-screw holes at location **A** in Figure 63 on page 97. If you plan to route the cables underneath the counter, use the base plate as a pattern to drill the cable opening and for drilling the holes for the mounting screws.
2. Attach the base plate to the countertop with two mounting screws.

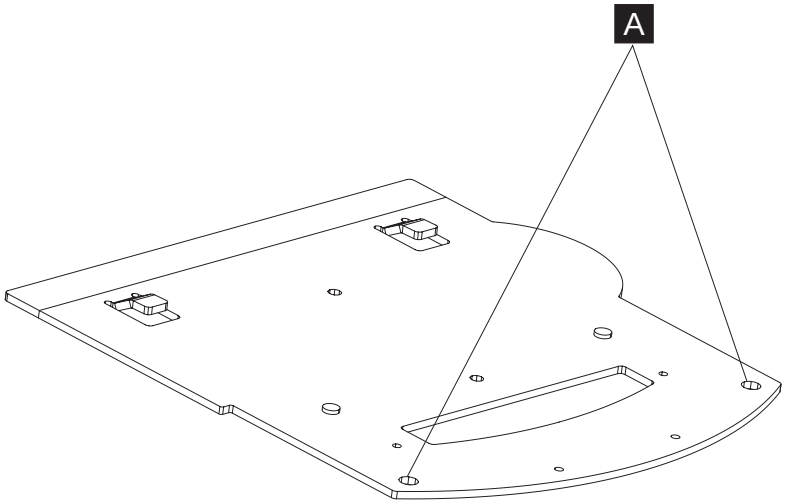


Figure 63. Attaching the base plate to the countertop

3. Connect the power cable to the power supply.
4. Connect the peripheral device cables to the appropriate ports on the rear connector panel. Make the connections on the bottom row of the connector panel first and work upward. Ensure that the cables are routed to the right of the power cord.

   Note: For a diagram of the port layout, see “Connectors, power, and brightness controls” on page 5.
5. Rotate the cable-tie bar back into place and connect to the hinge.
6. Use tie-wraps to secure cables to the cable-tie bar, if desired. Tie-wraps are to be supplied by customer.
7. Replace the rear cover.
8. Plug the AC power cord into an AC outlet.
9. After your installation is complete, switch ON the power to the SurePOS 500 and verify that the system is operating correctly by checking the indicator lights (LEDs) on the front of the touch-sensitive screen.
10. Install your software. Refer to *IBM SurePOS Model 526, 566, and E2S Operating System Installation Guide*.

Keyboard-integration tray

This section describes how to install a keyboard-integration tray with the SurePOS 500 Models 526, 566, and E2S.

Countertop and full-size cash drawer

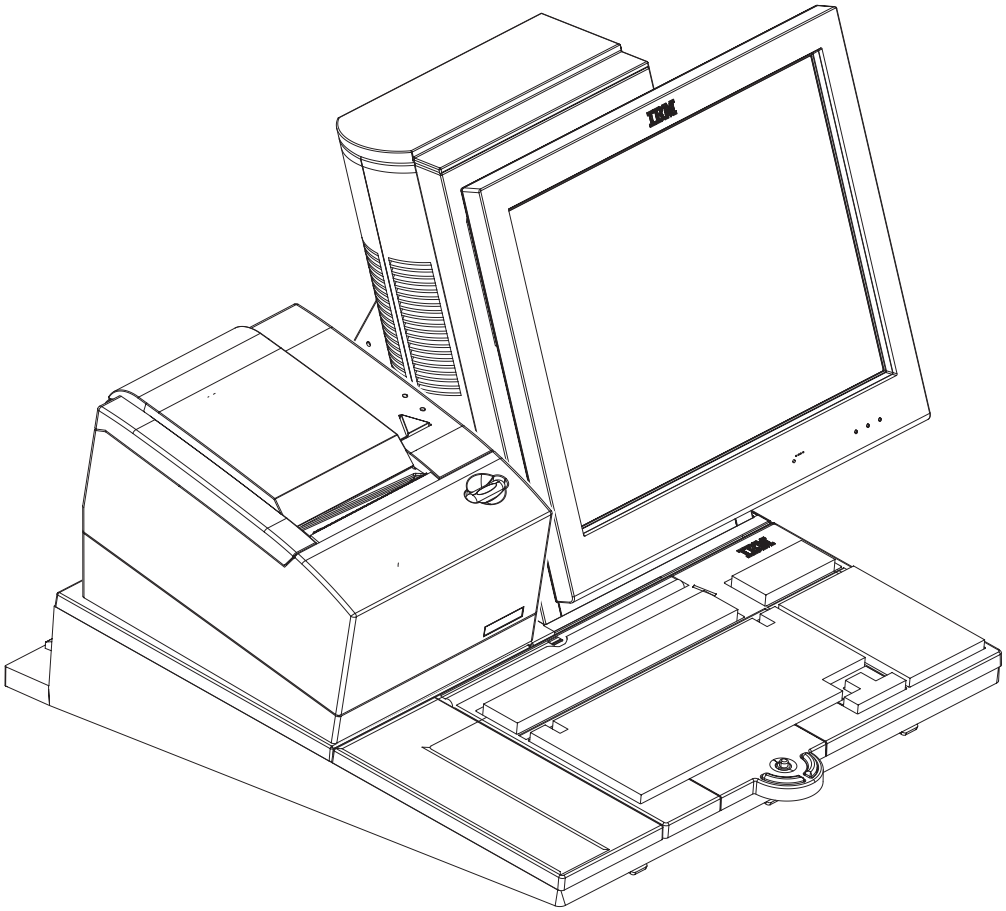


Figure 64. Full-size keyboard-integration tray on a countertop

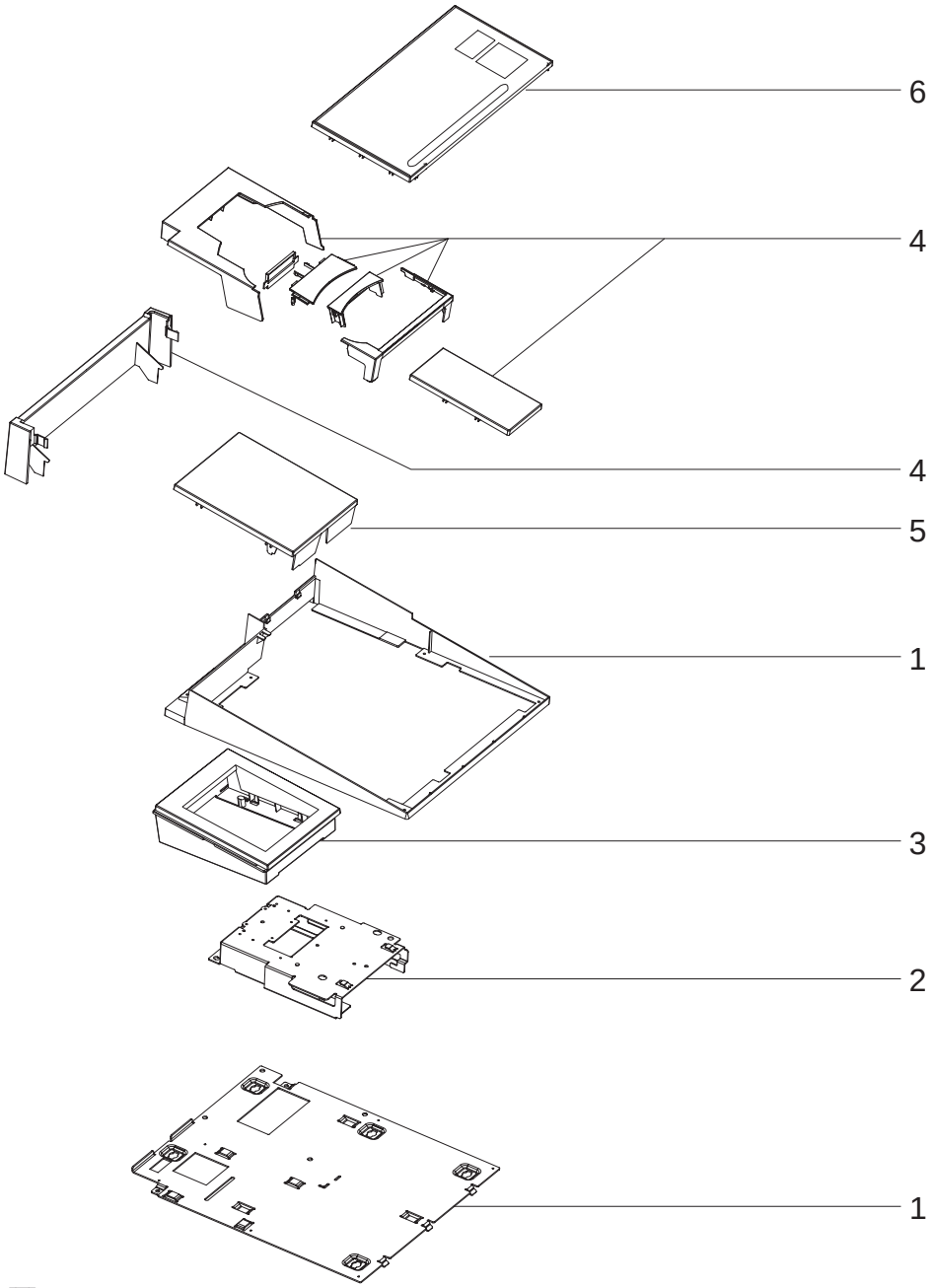
The full-size keyboard-integration tray can be used as a free-standing unit, secured to a countertop using mounting screws or mounted to a cash drawer. The SurePOS 500 is mounted with the 4610 SureMark printer using the full-size keyboard-integration tray.

Important

Devices such as the printer, integrated character display, and keyboard are mounted the same way when the full-size keyboard-integration tray is used for a countertop or cash drawer mount. Therefore, the instructions for the countertop and cash drawer mount have been combined.

Note: All parts included with integration tray except **6**, filler panel.

Figure 65. Countertop and keyboard integration tray and filler panels.



1 Cash drawer or countertop plate and fence assembly
2 SurePOS 500 mounting plate
3 Printer footprint adapter
4 Filler panels, wide and countertop
5 Filler panel, printer
6 Filler panel, wide keyboard

Mounting the integration tray to a countertop

Use the countertop keyboard-integration tray as a pattern for drilling the four mounting holes and for the cable opening, if you plan to route the cables through the countertop.

Note: Four screws (not provided) are required to mount the integration tray to a countertop.

1. Prepare the SurePOS 500 to mount to the keyboard-integration tray:
   a. Remove the rear cover.

      Notes:

      1) If you are routing cables underneath the counter, route them through the cable-access hole in the counter.
      2) If you are routing cables on top of the counter, route them out the back of the system. Lay them flat along the countertop.
2. For a free-standing unit, ensure that the rubber feet **A** are installed on the bottom of the countertop keyboard integration tray (as shown in Figure 66 on page 101).
3. To secure the **full-size keyboard-integration tray to a countertop**, perform the following steps:
   a. Remove the fence **E** from the countertop keyboard-integration tray by removing the screws as shown in Figure 66 on page 101.
   b. Drill the four mounting holes and cut a hole in the countertop for cables if needed. Use the openings in the integration tray as a pattern for drilling mounting holes and a cable opening in the counter.
   c. Remove the rubber feet **A** located on the bottom of the integration tray. See Figure 66 on page 101 for location of feet.
   d. Attach the integration tray to the countertop using four mounting screws, one at each corner of tray. Secure the integration tray using screws and washers through the mounting holes for the rubber feet. Use 25 mm diameter washers and appropriate-sized screws.

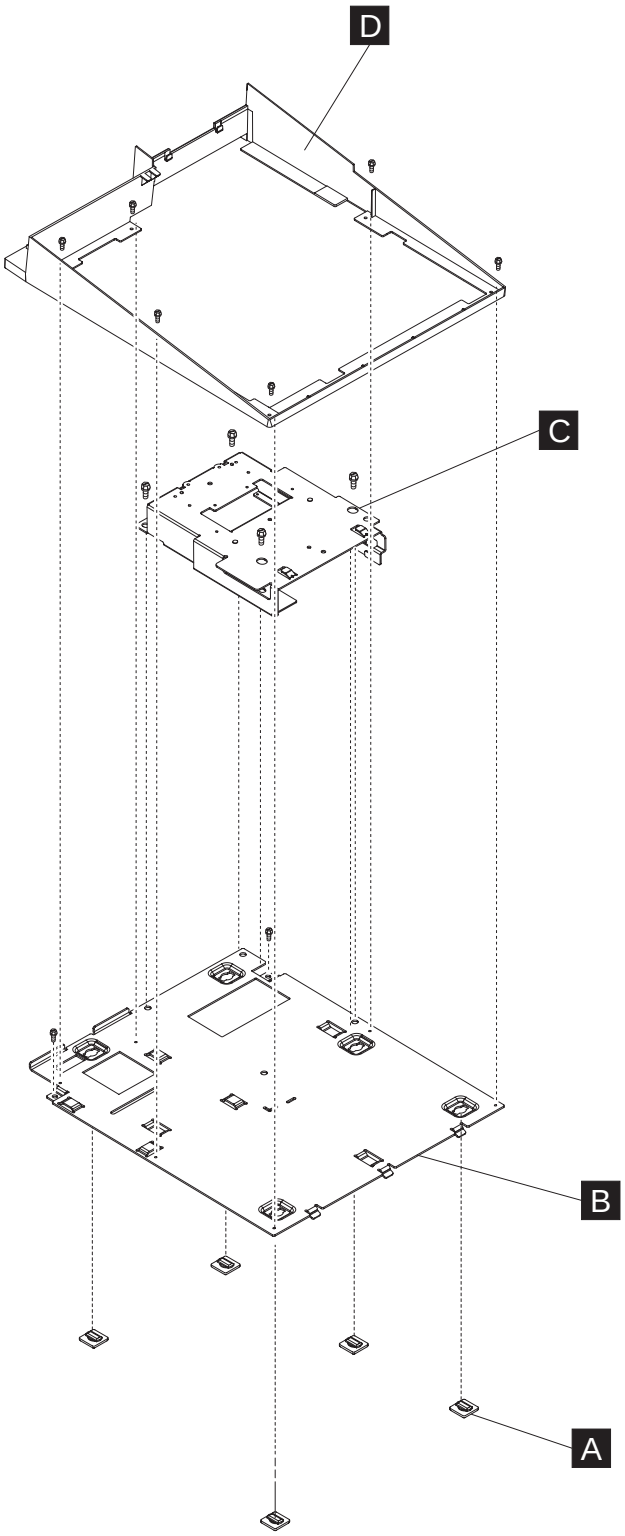


Figure 66. Countertop keyboard-integration tray assembly

Table 14. Countertop integration tray legend

A	Rubber feet	C	Mounting plate
B	Keyboard-integration tray	D	Fence

Mounting the integration tray to a cash drawer

1. Remove the rear cover on the cash drawer. While pressing in on the two buttons located on the sides of the cash drawer, pull back on the rear cover back to remove it. Discard this rear cover. A new rear cover is used for installation of the keyboard integration kit.
2. Install the keyboard-integration tray on a cash drawer:

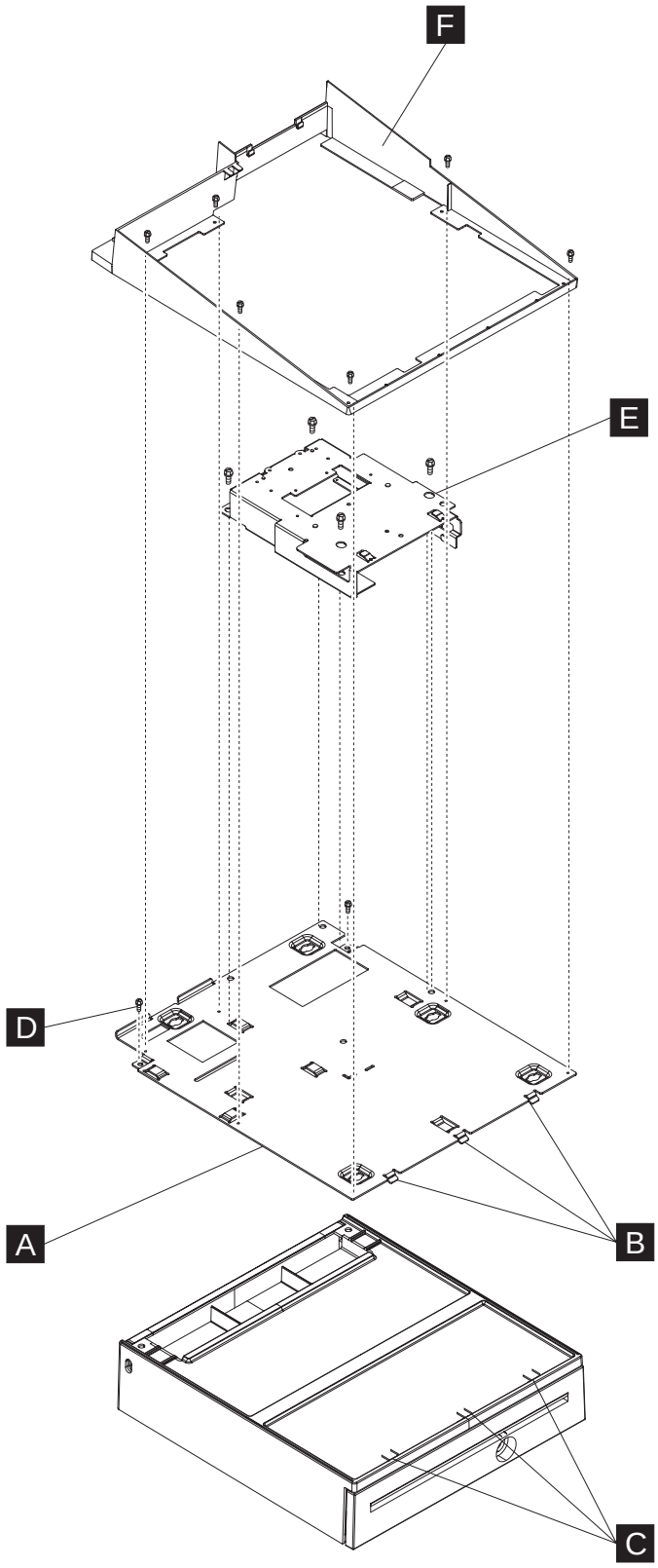


Figure 67. Installing the keyboard-integration tray on a cash drawer

a. Tilt the integration tray down so the three tabs **B** align with the three tab holes **C** on the cash drawer as shown in Figure 67 on page 103. Set the integration tray down on the cash drawer while aligning the screw holes **D** with holes on the cash drawer.

b. Secure the integration tray to the cash drawer with two screws at location **D** .

3. Continue with “Common steps for both the cash drawer and countertop installations.”

Common steps for both the cash drawer and countertop installations:

1. Attach the mounting plate **E** to the integration tray with four plastic washers and screws as shown in Figure 67 on page 103.
2. Attach the fence **F** to the integration tray with six small screws.
3. If not done already, remove the base plate from the system unit so that it can be installed into the integration tray. See “Base plate” on page 60.
4. Attach the SurePOS 500 to the mounting plate as shown in Figure 68 on page 105. Slide the unit from the back toward the front until the frame fits into the tabs **B** , and the screws **A** and mounting holes **C** are lined up. Tighten the two base-bracket screws. Reuse the screws that held the base plate to secure the system to the integration tray bracket.

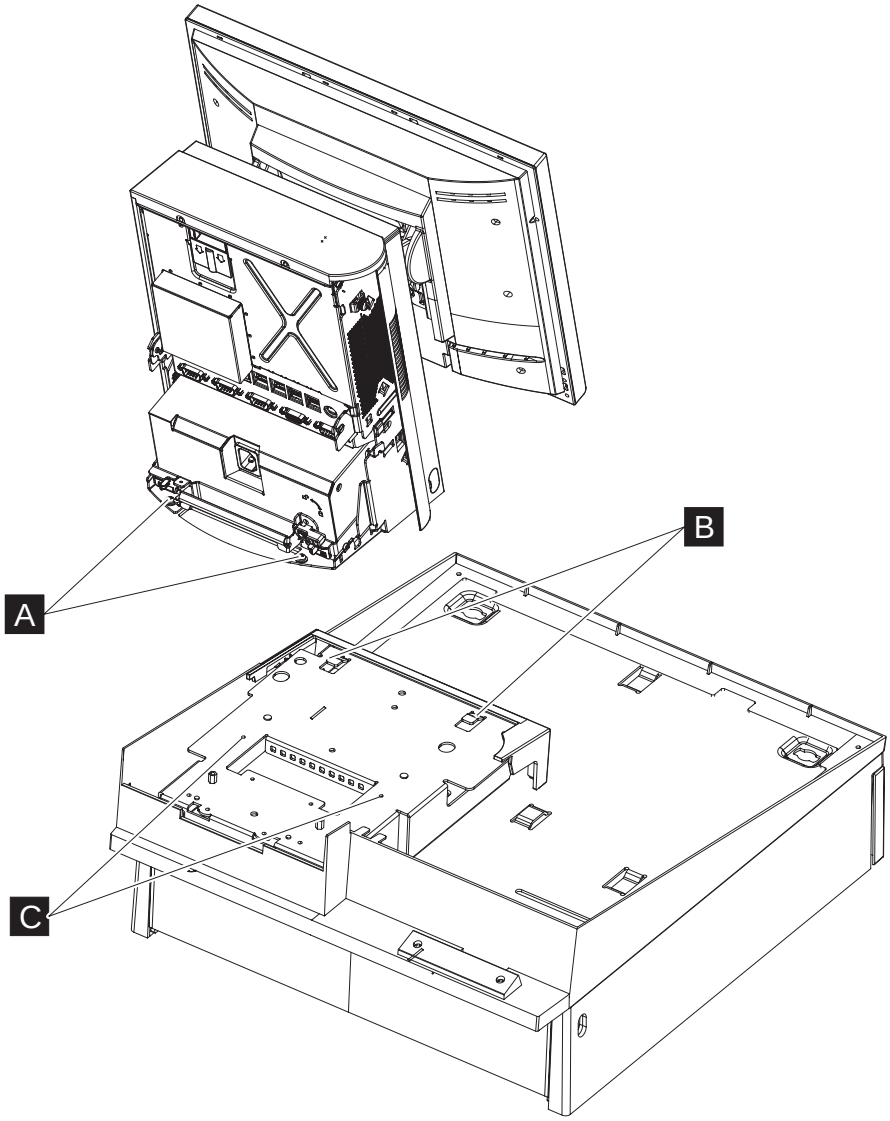


Figure 68. Installing the SurePOS 500 onto the integration tray

5. Install the IBM 4610 SureMark printer on the integration tray, by performing the following steps:

   Note: If no printer is to be installed, use the printer filler panel that is part of the Integration Tray as shown in Figure 65 on page 99. See the *4610 SureMark Point-of-Sale Printers User's Guide* for detailed information about switch settings and cabling for the printer.

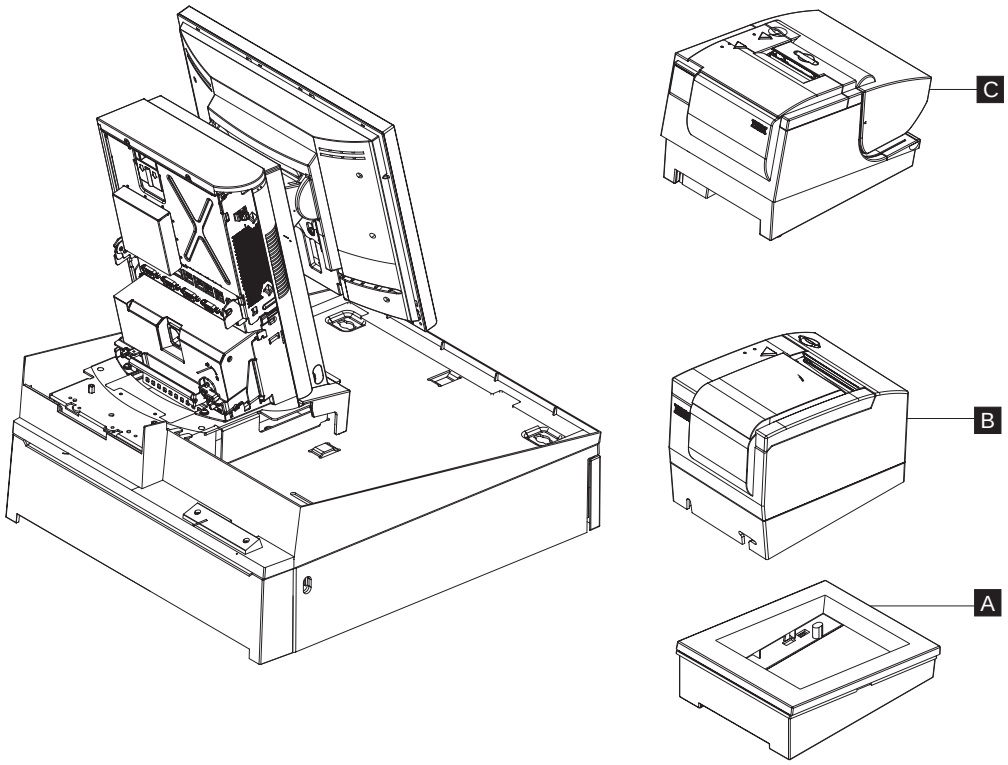


Figure 69. Installing the 4610 printer onto the integration tray

Table 15. 4610 SureMark printer on a full-size keyboard-integration tray legend

A	Printer stand for the 4610 Models TF6, TF7, 1NR, 1NA, and 1ND printers
B	4610 Models TF6, TF7, 1NR, 1NA, and 1ND printers (small footprint)
C	4610 Models TG3, TG4, TG5, 2CR and 2NR printers

a. Install the printer cables and route the cables as shown in Figure 77 on page 113.
   - For the small-footprint 4610 SureMark Models TF6, TF7, 1NR, 1NA, and 1ND printers **B**, first insert the plastic printer base **A** onto the integration tray and then place the printer into the printer base.
   - For the large-footprint 4610 SureMark Model TG3, TG4, TG5, 2CR and 2NR printers, place the printer directly onto the integration tray.

6. The front filler panel has to be installed before the keyboard is installed. Keyboard must be to the right with the filler panel on the left. To install the keyboard, perform the following steps. See Figure 70 for locations:

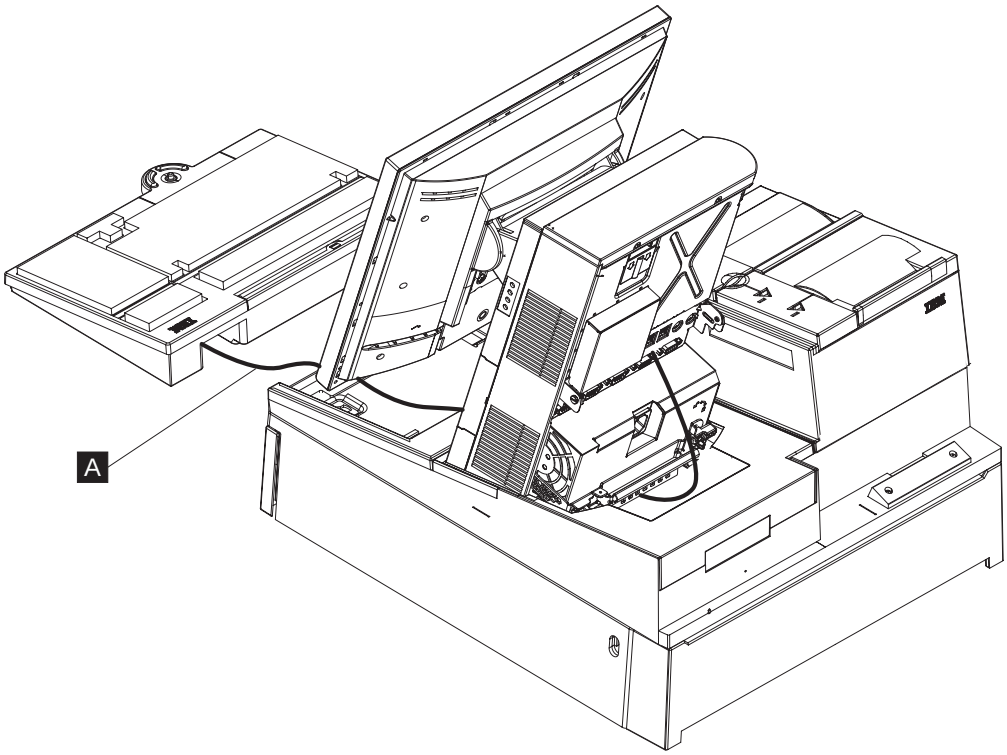


Figure 70. Installing the keyboard onto the integration tray

   a. Attach the keyboard cable **A** to the appropriate port on the rear connector panel.
   b. Place the keyboard on the integration tray while pushing the excess keyboard cable back under the system unit mounting bracket.
7. To install the mouse, connect it to the appropriate connector on the rear connector panel.
8. Prepare the distributed customer display to be installed on an integration tray.
   a. Route the distributed customer display cable through the mounting post (and post extension, if used) and plug the cable into the display.

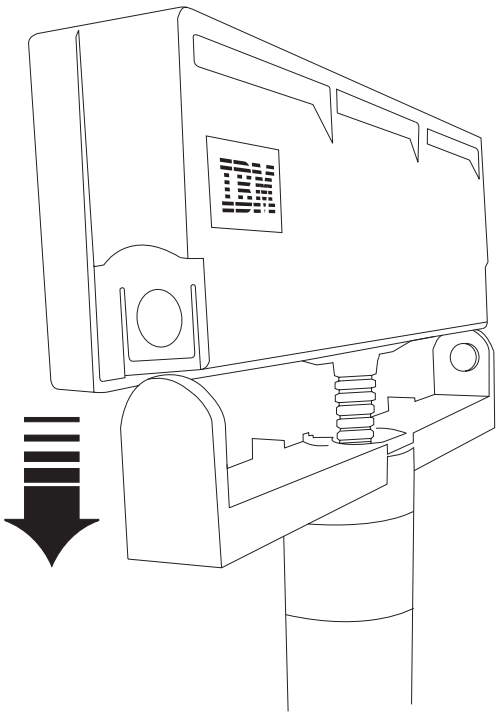


Figure 71. Attaching the distributed customer display

b. Attach the character display's top to its post by pressing the display down on the post until it snaps into place. See Figure 71.

9. To install a distributed customer display or an APA display, perform the following steps:

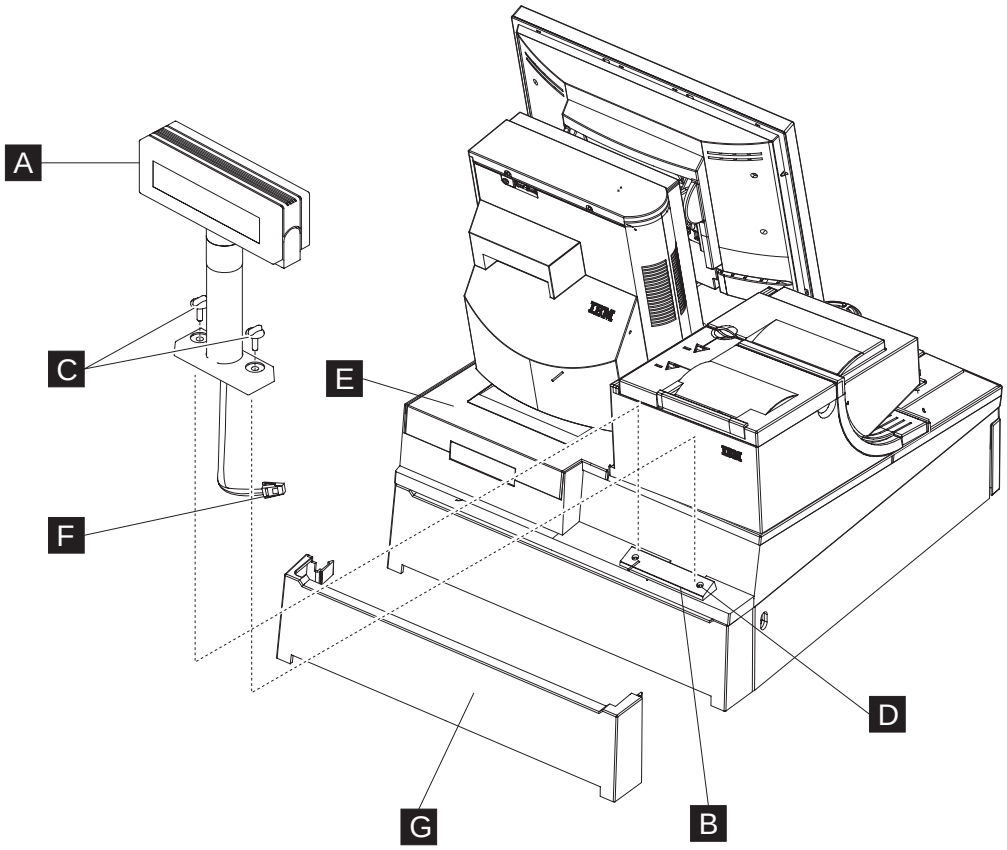


Figure 72. Installing the distributed customer display onto the integration tray

a. Route the display cable **F** through hole **D**, as shown in Figure 72.
b. Route the display cable to the rear connector panel, passing it under the cable-tie bar, and plug it into the 9-pin serial connector.
c. Attach the distributed customer display **A** to the cash drawer at location **B** with two thumbscrews **C**.

10. Plug the AC power cord to the power supply.
11. Connect the peripheral cables to the appropriate ports on the SurePOS 500 rear connector panel. Make the connections on the bottom row of the panel first and work upward.

    Notes:

    a. If you are routing the cables under the counter, route all cables (including the AC power cord) through the cable-access hole.
    b. If you are routing the cables on top of the counter, route all cables out the rear of the system. Lay the cables flat along the countertop.

12. Use tie-wraps to secure cables to the integration tray if desired. Tie-wraps are to be supplied by customer.
13. Replace the rear cover and install the rear filler panel.
14. Attach the cash-drawer rear cover by aligning the tabs with the buttons, and push in on the cover.
15. Connect the system and printer (if necessary) to a power outlet.
16. Switch ON the power and verify that the system is operating correctly by checking the indicator lights (LEDs) on the front of the touch-sensitive screen.

17. Install your software. Refer to *IBM SurePOS Model 526, 566, and E2S Operating System Installation Guide*.

Installing additional peripheral devices

Attention: Before you use the following procedures to install additional peripheral devices, reference *IBM Safety Information — Read This First*, GA27-4004

Mounting a distributed customer display and APA display to a cash drawer

The SurePOS 500 Models 526, 566, and E2S provide a powered, 9-pin, serial port for attaching a distributed customer display, APA character-graphic display, or other device requiring a powered serial connection. The SurePOS 500 Models 526, 566, and E2S distributed customer display is mounted behind the cash-drawer modesty panel. It can also be mounted to a countertop with customer-provided hardware. Use these instructions to mount a character display to a cash drawer.

1. Prepare the system for installation of the distributed customer display.
   a. Switch OFF the power at the system unit.
   b. Remove the SurePOS 500 Models 526, 566, and E2S rear cover (see “Rear cover removal” on page 35) to access the rear connector panel.
2. Prepare the distributed customer display to be installed on an integration tray.
   a. Route the distributed customer display cable through the mounting post (and post extension, if used) and plug the cable into the display, as shown in Figure 73.

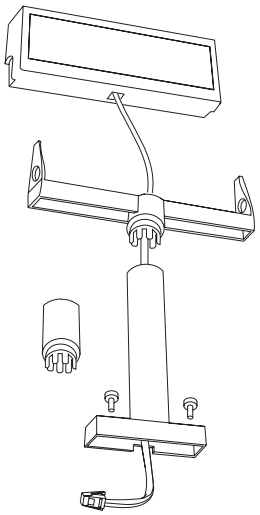


Figure 73. Attaching the distributed customer display cable

   b. Attach the character display top to its post by pressing the display down on the post until it snaps into place.

3. To install a distributed customer display on a keyboard-integration tray, perform the following steps:
   a. Route the character display cable through the hole behind mounting post as shown in Figure 74. You might need to lay the display on its side to connect the display cable to the system unit rear connector panel.

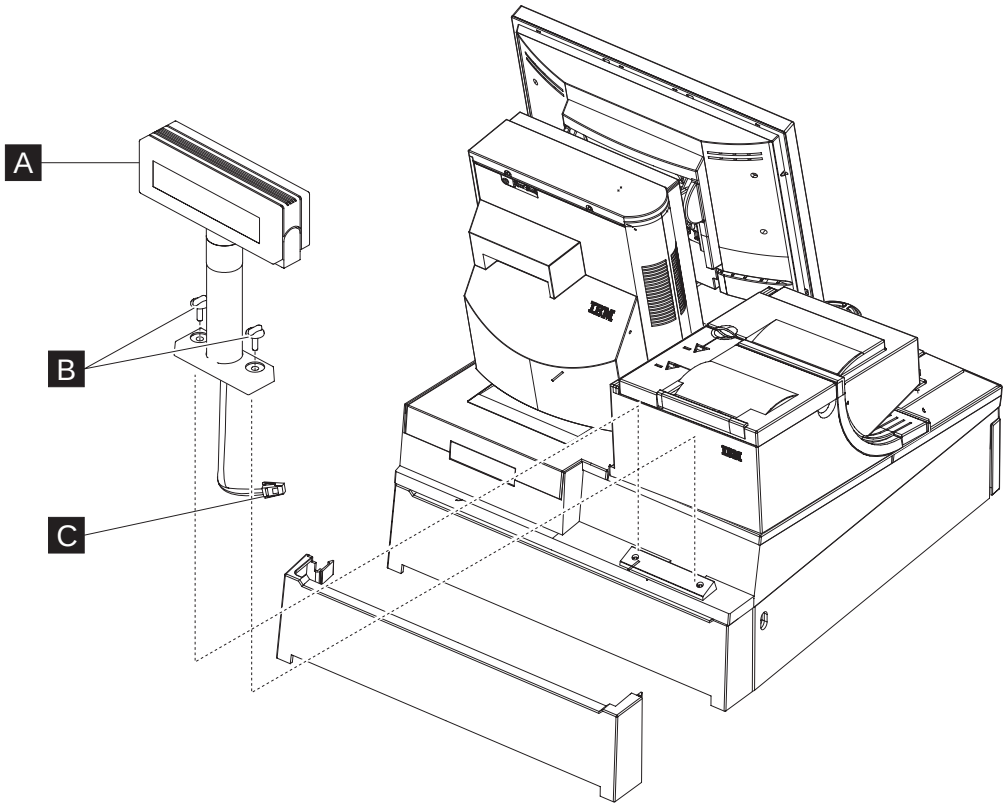


Figure 74. Installing the distributed customer display onto the keyboard integration tray

   b. Route the distributed customer display cable **C** to the rear connector panel, passing it under the cable-tie bar. Plug it into the 9-pin serial connector.
   c. Attach the distributed customer display **A** to the cash drawer mounting post with two thumbscrews **B** . Snap the entire unit into place at the rear of the tray, as shown in Figure 74.

Installing IBM 4610 SureMark Models TF6, TF7, 1NR, 1NA, or 1ND printers

The IBM 4610 SureMark Model TF6, TF7, 1NR, 1NA, and 1ND are the smaller 4610 models that contain only a thermal customer receipt station. These models do not support document printing. For detailed information about these printers, see the *IBM 4610 SureMark Point-of-Sale Printers User's Guide*.

The 4610 TF6, TF7, 1NR, 1NA, and 1ND can be installed as a freestanding unit attached to a countertop integration tray. For the keyboard-integration tray, the 4610 TF6, TF7, 1NR, 1NA, or 1ND is set into a plastic printer base and then set on the keyboard integration tray.

An interface card provides communication with the SureMark Models 1NR, 1NA, or 1ND to the system unit. Select the card for your type of communication: the RS-232 or USB.

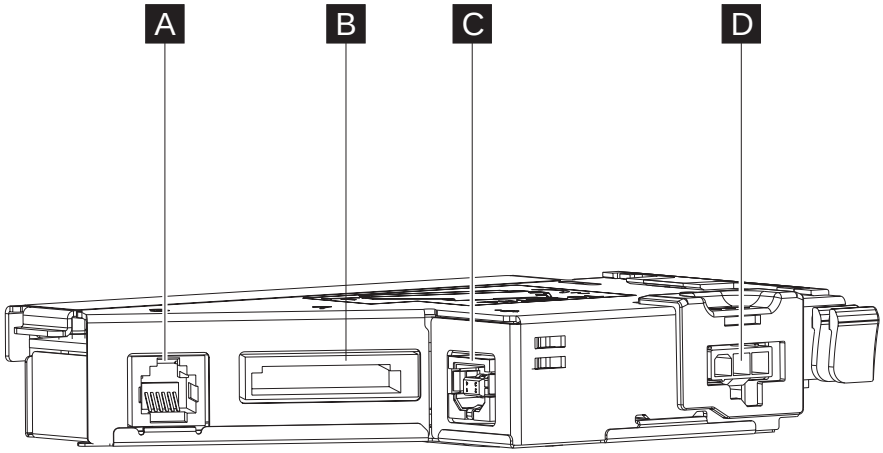


Figure 75. USB interface card for 1NR, 1NA, and 1ND

A Cash drawer

B Powered USB

C Standard USB

D Power supply

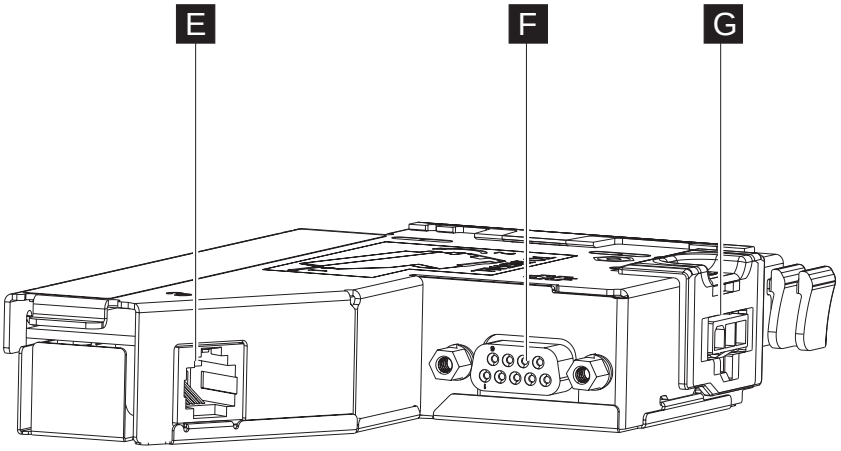


Figure 76. RS-232 interface card for 1NR, 1NA, and 1ND

E Cash drawer

F RS-232

G Power supply

To install the 4610 TF6, TF7, 1NR, 1NA, or 1ND printer, perform the following steps:

1. Turn off the printer power switch, unplug the power supply, and turn off the power at the system unit.
2. Remove the SurePOS 500 rear cover (see “Rear cover removal” on page 35).

3. Check the printer RS-232 mode-switch setting for the printer. It is near the rear cable connections. See **E** in Figure 76 on page 112 for switch location. For switch settings, see the *IBM 4610 SureMark Point-of-Sale Printers User's Guide*.

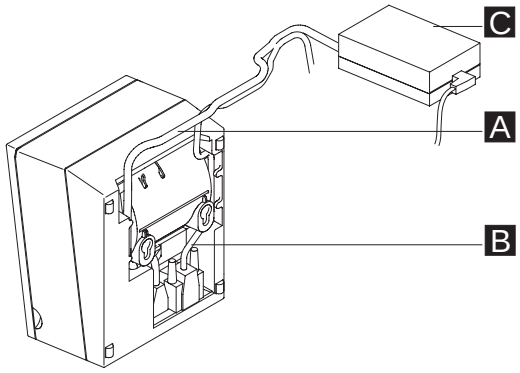


Figure 77. Attaching and routing the cables to the printer..

4. Connect and route the RS-232 communication cable, and either
   - Plug into a power supply **C** in Figure 77. or
   - A 24 V powered-USB cable **A** (the power supply is not needed).
5. Connect any other signal cables for I/O devices to the correct ports.
6. If you are installing a freestanding printer, route the cables to the rear connector panel on the SurePOS 500 Models 526, 566, and E2S system unit. Pass the cables under the cable-tie bar, and plug it into one of the serial ports.

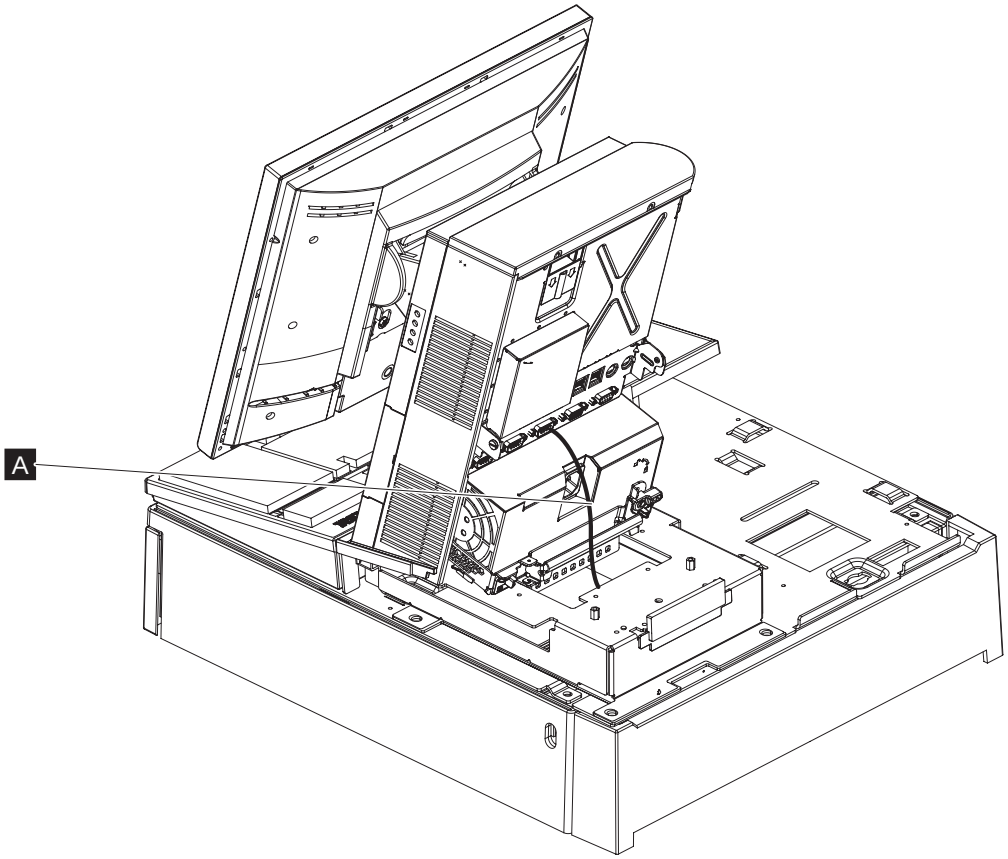


Figure 78. 4610 TF6, TF7, 1NR, 1NA, or 1ND cable routing

7. After the installation is complete, turn on the printer power switch, connect the power supply (if necessary), and turn on the power at the system unit.

Installing IBM 4820 SurePoint Solution and other external video displays

The SurePOS 500 provides dual-display capability. The SurePoint Solution (machine type 4820) can be integrated onto the base of the SurePOS 500, integrated on a keyboard integration tray of a SurePOS 500, or attached as a stand alone distributed model. Other external VGA devices can be connected to the VGA port.

Distributed 4820 SurePoint Solution installation

To install a distributed 4820, follow the instructions provided in the *IBM 4820 SurePoint Solution Installation and Service Guide* and install the 4820 SurePoint Solution display.

Integrated 4820 SurePoint Solution installation

The integrated 4820 can be mounted to a free-standing SurePOS 500 or on a full-size keyboard integration tray. Go to the procedure for your configuration:

- For a 4820 mounted to a free-standing SurePOS 500 , go to “4820 display” on page 74.
- For a 4820 mounted to a full-size keyboard-integration tray on a cash drawer or countertop, go to “Mounting a 4820 on a keyboard integration-tray” on page 115.

Mounting a 4820 on a keyboard integration-tray: Use this procedure to attach the 4820 to a full-size integration tray mounted on a countertop or a cash drawer. The following procedure shows the 4820 being mounted to a full-size cash drawer. The other mounting configurations are similar.

1. Switch OFF the power at the SurePOS 500.
2. Remove the rear filler panel, **D** in Figure 79.
3. Remove the SurePOS 500 rear cover (see “Rear cover removal” on page 35) to access the rear connector panel.

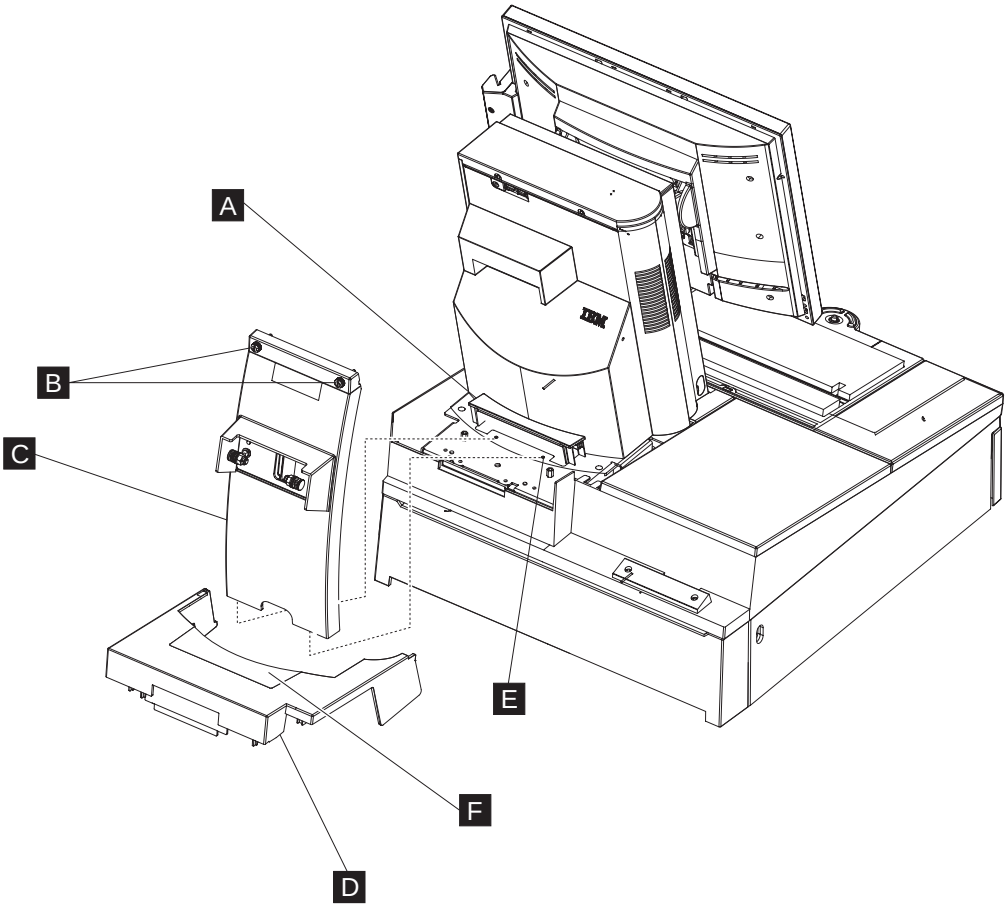


Figure 79. 4820 SurePoint Solution installation

4. Remove the small filler panel **F** from the rear filler panel, as shown in Figure 79.
5. Secure the 4820 bracket **C** with the two screws **E** in Figure 79.
6. Route the 4820 display cable to the rear connector panel, and plug it into the external video connector, as shown in Table 4 on page 7.
7. Connect the 4820 display cable to the 4820 connector located on the back of the display.
8. Attach the DC connector from the power brick to the power inlet on the 4820, *or* you can power the 4820 using a cable to the 12 V USB port. Then route the power cable and the video cable through the stand bracket of the 4820.
9. Install the cable cover on the 4820 stand.
10. Install the hinge cover.
11. Install rear cover.

12. Install the small filler panel between 4820 bracket and rear cover **A** in Figure 79 on page 115.
13. Attach 4820 bracket to the top of the system unit with thumbscrews **B** in Figure 79 on page 115.
14. Reinstall the rear filler panel.
15. Power on.

Appendix A. Field replaceable units

This chapter contains field-replaceable part number information the SurePOS 500 Models 526, 566, and E2S.

How to use the FRU catalog

This parts listing contains reference drawings and a corresponding index for all field replaceable parts. The index provides the part number, the quantity required (units), and a description of the part.

Listed below is additional information about the parts assembly index.

SIMILAR ASSEMBLIES

If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts specific to one or the other of the assemblies are listed separately and identified by description.

AR (As Required) in the Units column indicates that the quantity is not the same for all machines.

NP (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.

NR (Not Recommended) in the Units column indicates that the part is procurable, but not recommended for field replacement, and that the next higher assembly should be ordered.

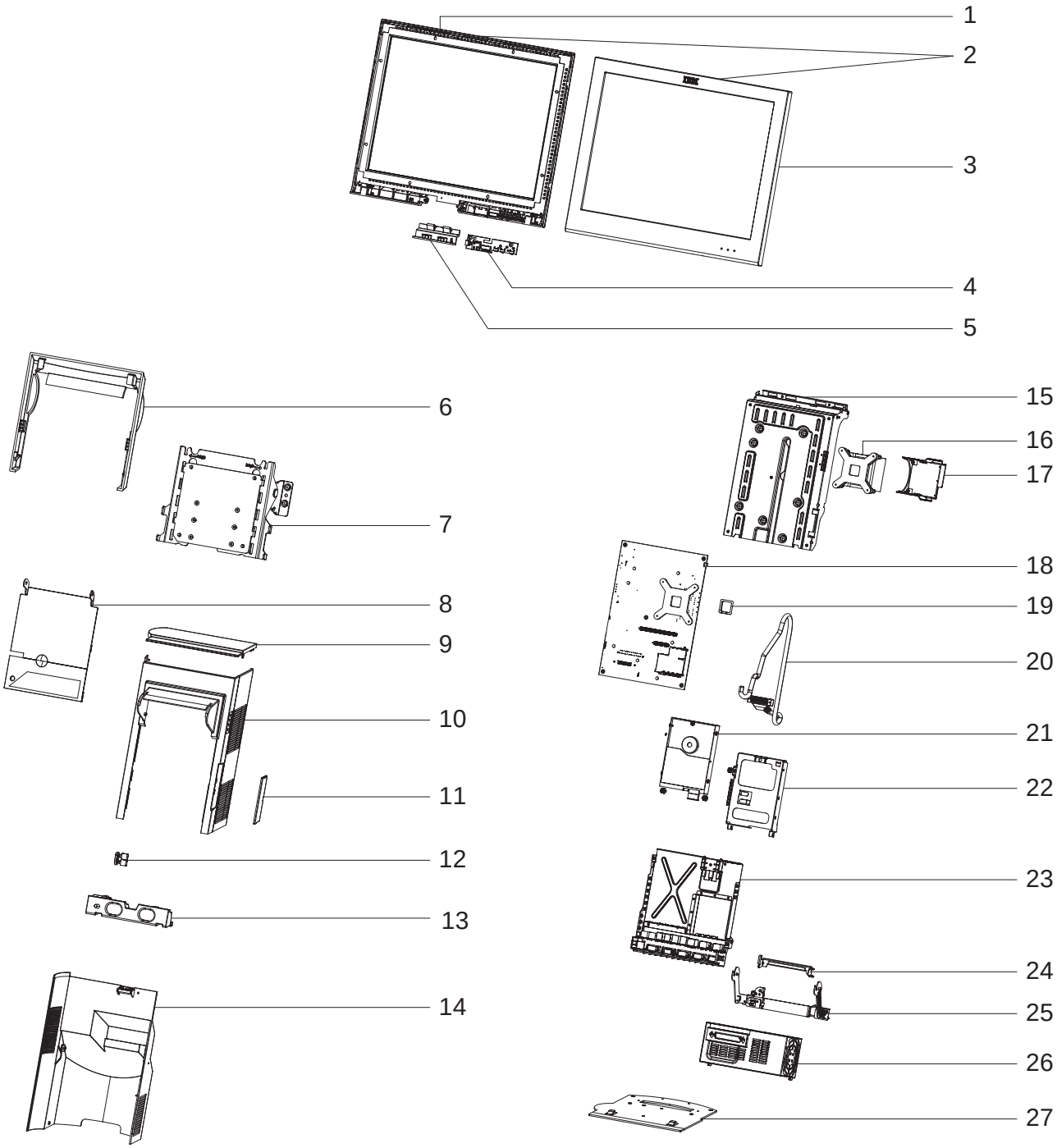
R (Restricted) in the Units column indicates the part has a restricted availability.

INDENTURE

The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly.

No Dot	Main assembly
One Dot	Detail parts of a main assembly
One Dot	Subassembly of the main assembly
Two dots	Detail part of a one-dot subassembly
Two dots	Subassembly of a one-dot subassembly
Three dots	Detail part of a two-dot subassembly

Assembly 1: Models 526, 566, and E2S

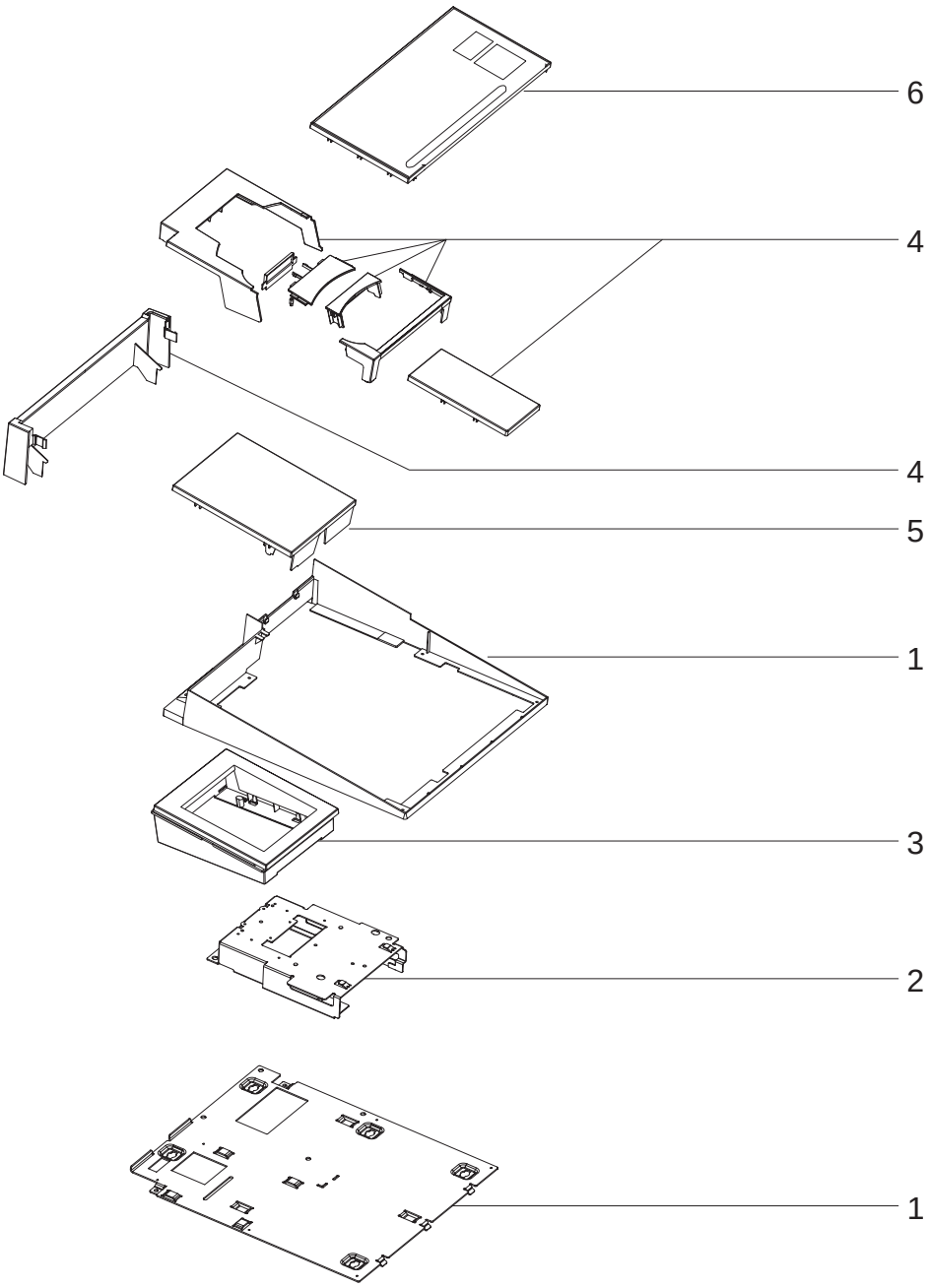


Asm–Index	Part Number	Units	Description
1–1	54Y2413		LCD assembly, Premium
–1	54Y2414		LCD assembly, Entry
–2	54Y2409		Tablet assembly, Premium
–2	54Y2410		Tablet assembly, Entry
–3	54Y2411		Front bezel assembly, Premium
–3	54Y2412		Front bezel assembly, Entry
–4	54Y2415		Operator card kit
–5	54Y2416		Touch cable door
–	54Y2419		Tablet cable cover
–	54Y2420		Tablet VESA plate
–6	54Y2422		Hinge cover
–7	54Y2418		Hinge
–8	54Y2424		Front cover with speaker
–	54Y2425		Front cover, no peaker
–9	54Y2426		Top cover
–10	54Y2421		Main cover kit
–11	54Y2443		PC card door
–12	54Y2446		Audio port cover
–13	54Y2427		Speaker (Premium models only)
–14	54Y2423		Rear cover
–15	54Y2417		System board tray
–16	54Y2433		Processor heat sink, Premium
–17	54Y2432		Processor fan/fan duct, Premium
–18	54Y2441		System board assembly, Entry (The system board comes with motherboard tray and top cover.)
–18	54Y2442		System board assembly, Premium (The system board comes with motherboard tray and top cover.)
–19	44V2041		Modular flash drive
–20	54Y2440		Tablet cable, 15 in.
–	54Y2438		HDD assembly (HDD, bracket, 4 screws)
–21	54Y2437		HDD
–22	54Y2436		HDD bracket
–	54Y2439		HDD cable kit
–	54Y2434		E1500 Processor
–23	54Y2430		Tailgate assembly, Premium
–23	54Y2431		Tailgate assembly, Entry
–24	54Y2428		Cable tie bar
–25	54Y2429		Power supply latch arm
–26	54Y2266		Power supply (The power supply comes with latch arm and cable tie bar.
–	54Y2444		Power supply EMC shield
–27	54Y2435		Base
–	45P6222		Battery
–	54Y2445		Screw kit **This FRU contains:**
–			Frame to base screws
–			PS latch studs
–			Upper shield studs
–			Motherboard screws
–			6.5 mount screw
–			4820 mount screw
–			Payment terminal thumbscrew
–			Hard drive screws
–			Motherboard tray screws, M3x3
–			LCD screw, M3x4

Assembly 1: (continued)

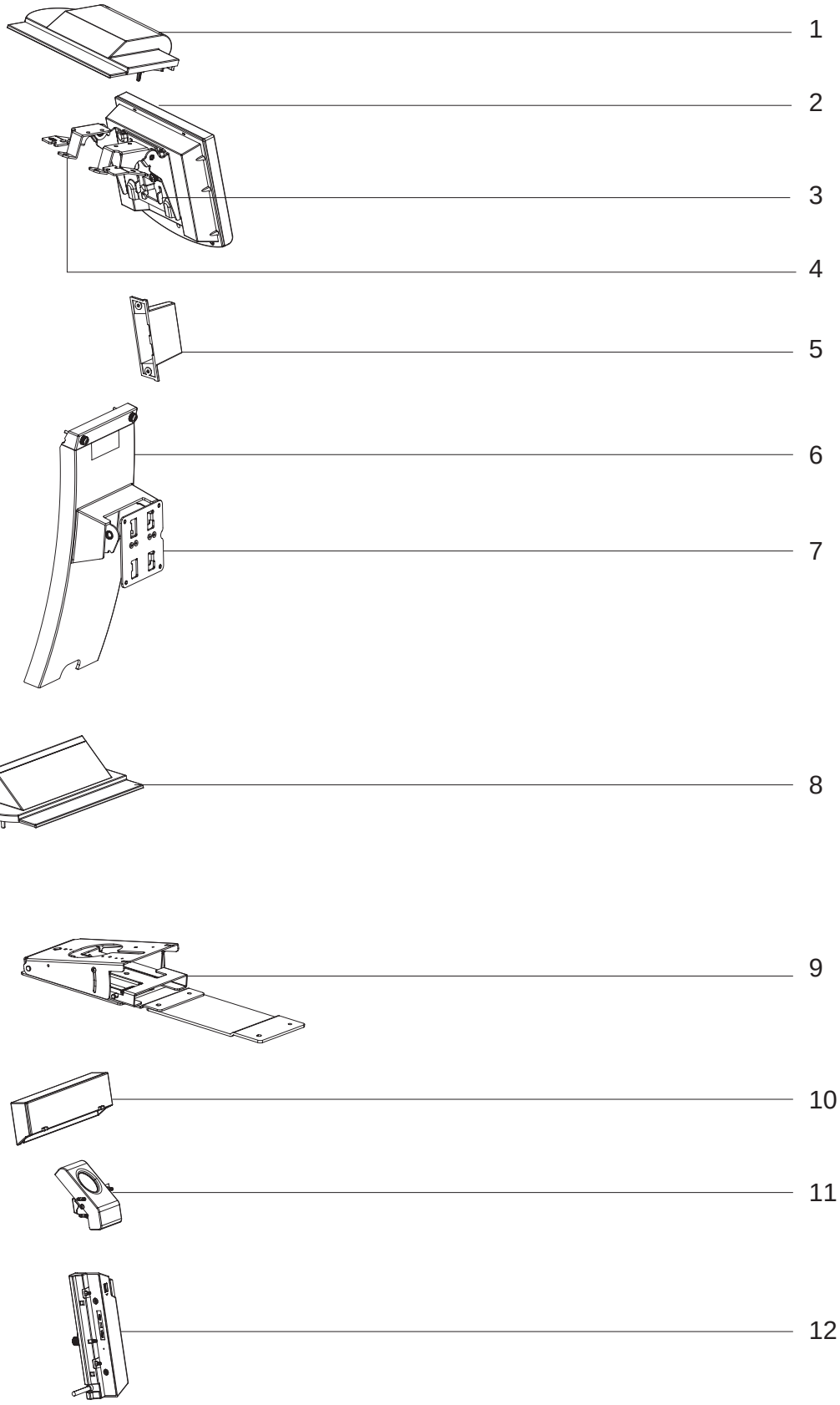
Asm–Index	Part Number	Units	Description
–			Tablet rear cover screw, M3x6, black nickel
–			4820 frame screw, M3x4
–			Base plate screw, M4x4
–			Payment terminal screw, M3x10
–			Payment terminal screw, M4x8
–			Antenna dongle screw, M3x25, black nickel
–			Hinge bracket thumbscrew
–			Tablet VESA bracket screw, M3x6
–			MSR thumbscrew
–			Support clip for modular flash drive
–			rubber feet
–	54Y2447		Memory, 512 MB (Entry)
–	54Y2449		Memory, 1 GB (Entry/Premium)
–	54Y2450		Memory, 2GB (Premium)
–	41D9746		USB memory key

Assembly 2: Countertop and cash drawer keyboard integration tray and filler panels



Asm–Index	Part Number	Units	Description
2–1	41D0214		Plate/Fence assembly wide cash drawer or countertop
–2	54Y2466		Plate assembly, terminal mounting
–3	47P9273		Printer footprint adapter
–4	54Y2467		Filler panels, wide
–5	54Y2469		Filler panels, printer
–6	14R0157		Filler panels, wide keyboard
–	41D0216		Tray hardware kit **This FRU contains:**
–			Insulating washers
–			Rubber feet
–			Screws, M3x5
–			Screws, M6x8
–			Screws, M6x12
–			Screws, M5x10
–	54Y2468		Integration tray migration kit **This FRU contains:**
–			Plate assembly, terminal mounting
–			Filler panel, front
–			Filler panel, back
–			Filler panel, 4820 stand
–			Filler panel, tray center
–			Screws, 4x

Assembly 3: Optional peripherals



Asm–Index	Part Number	Units	Description
3–1	54Y2649		6.5 Tower top cover
–2	54Y2459		6.5 Display
–3	69Y6301		6.5 Vesa plate
–4	54Y2460		6.5 Display mount
–	54Y2461		6.5 Analog video cable
–	54Y2462		6.5 Power cable
–5	54Y2457		Extended express card cover
–6	54Y2464		4820 Integrated mount cover kit (only includes plastic covers)
–7	54Y2463		4820 Integrated mount (complete kit including plastic covers)
–8	54Y2452		VFD display, integrated
–8	54Y2453		VFD housing, integrated
–9	54Y2465		Payment terminal mount
–10	54Y2458		USB Antenna cover kit
–11	54Y2578		Fingerprint reader
–12	54Y2455		MSR, 3-track
–12	54Y2456		MSR, JUCC
–	41D0161		Display, distributed 2x20
–	41D0163		Display, APA
–	46N1598		Mounting screws for 4820
–			

Assembly 4: Miscellaneous parts

Asm–Index	Part Number	Units	Description
4–	44V2011	1	Distributed display cable for distributed 2X20 and APA displays, long
–	54Y2454	1	Distributed display cable for distributed 2X20 and APA displays, short
–	40N5613	1	Power cable, 4610–T6/7, 0.7
–	40N5612	1	Power cable, 4610–T6/7, 2.0
–	20P0337	1	Thumbscrew
–	20P0334	1	Mounting post assembly
–	20P0360	1	Mounting post extension assembly
–	20P0338	1	Yoke, 1 sided
–	10J0851	1	Lens kit distributed
–	45T9436		CAT 6 Ethernet cable (Premium Models)
–	41A3531		CAT 5 Ethernet cable (Entry Models)
–	44V2014		RS232 9–pin to 15–pin adapter cable

Appendix B. Power cords

Table 16. Power cords

FRU P/N	Usage
39M5066	Argentina, Paraguay, Uruguay
39M5079	Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Canada, Cayman Islands, Costa Rica, Columbia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines (HV use), Saudi Arabia, Thailand, Turks and Caicos Islands, United States, Venezuela
39M5100	Australia, Fiji, Kiribati, Nauru, New Zealand, Papua New Guinea
39M5121	Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Rep, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (Peoples Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Replublic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), Zaire
39M5128	Denmark
39M5142	Bangladesh, Lesotho, Macao, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, Uganda
39M5149	Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, Cyprus, Dominica, Gambia, Ghana, Grenada, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Qatar, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad & Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe, Uganda
39M5156	Liechtenstein, Switzerland
39M5163	Chile, Italy, Libyan Arab Jamahiriya
39M5197	Japan
39M5204	China (SAR)
39M5217	Korea (Democratic Peoples Republic of), Korea (Republic of)
39M5224	India
39M5231	Brazil
39M5245	Taiwan
39M5170	Israel
39M5077	Columbia, United States (required in Chicago), 1.8 meter non-locking
39M5135	Japan, 4.3 meter locking
39M5107	United States, 4.3 meter locking
39M5162	Chile, 2.8 meter non-locking
39M5065	Argentina, 2.8 meter non-locking
39M5099	Australia, 2.8 meter non-locking
39M5078	Columbia, 2.8 meter non-locking
39M5230	Brazil, 2.8 meter non-locking

Note: Unless otherwise indicated, all power cords are 4.3 meter (14.1 feet) non-locking.

Appendix C. System specifications and planning information

This appendix provides information on power subsystems, and environmental requirements.

Physical specifications and dimensions

The SurePOS 500 Series physical specifications are described in Table 17.

Table 17. Height, weight and depth of the SurePOS 500 Models 526, 566, and E2S

4852	Weight	Height: Tablet at 15 degrees	Height maximum	Depth: Tablet at 15 degrees	Depth: Tablet at 60 degrees	Width
15-in. tablet	12.3 kg (27 lbs)	376 mm	386.5 mm	311.2 mm	392 mm	359.1 mm

Table 18. Weights of integrated, distributed displays and MSR

Component	Weight
Integrated 2x20 display	0.2 kg (0.38 lbs)
Distributed 2x20 display	0.5 kg (1.2 lbs)
Distributed APA display	0.7 kg (1.6 lbs)
MSR (three-track or JUCC)	0.16 kg (0.41 lbs)

Dimensions with trays

Note: The tablet is shown at 15 degrees. All measurements are in mm.

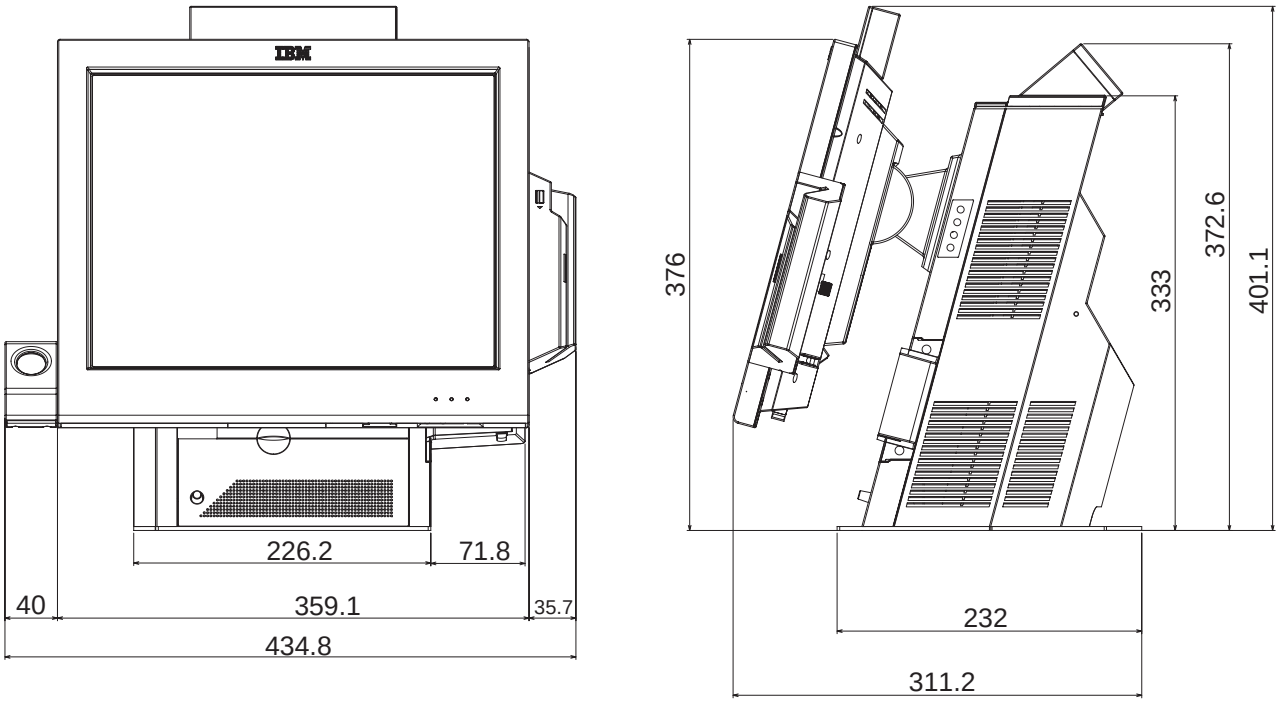


Figure 80. Dimensions of SurePOS Models 526, 566, and E2S.. The tablet is shown at 15 degrees.

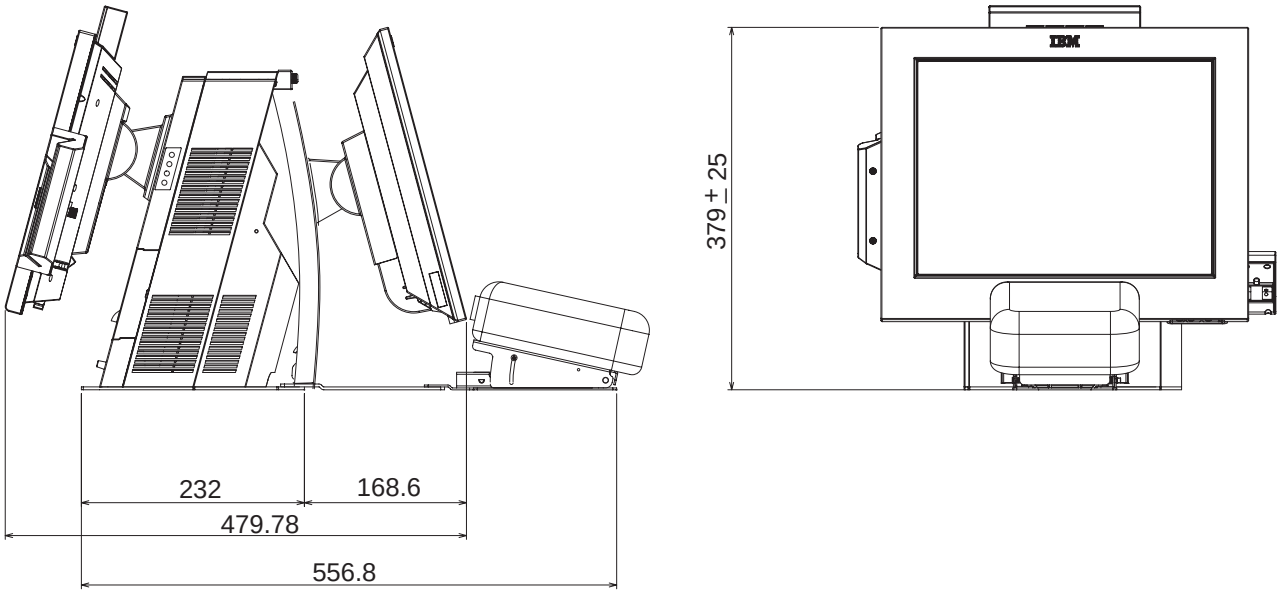


Figure 81. SurePOS 500 Models 526, 566, and E2S with 4820 Solution and payment terminal mount with extension installed

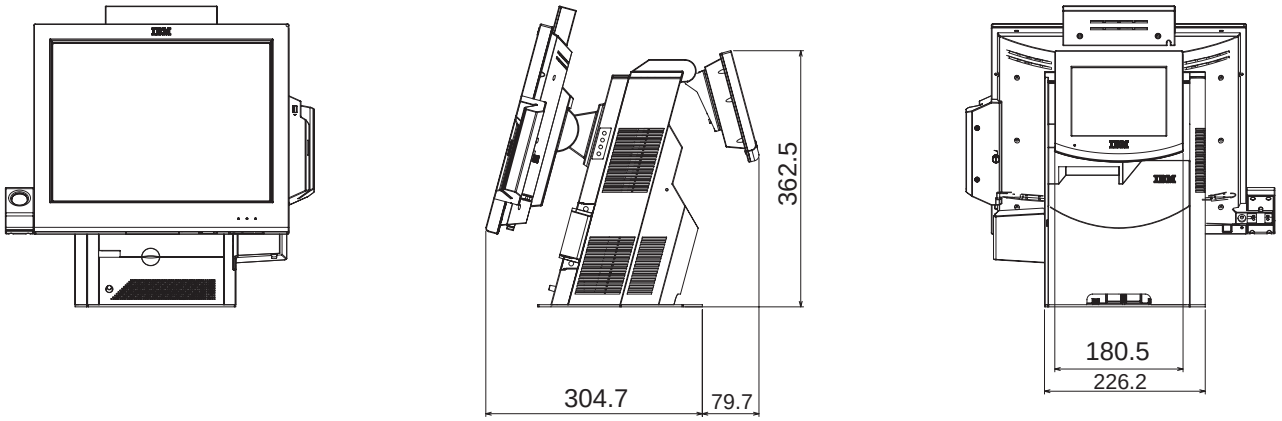


Figure 82. SurePOS 500 Models 526, 566, and E2S with 4820 SurePoint Solution with rear 6.5 display

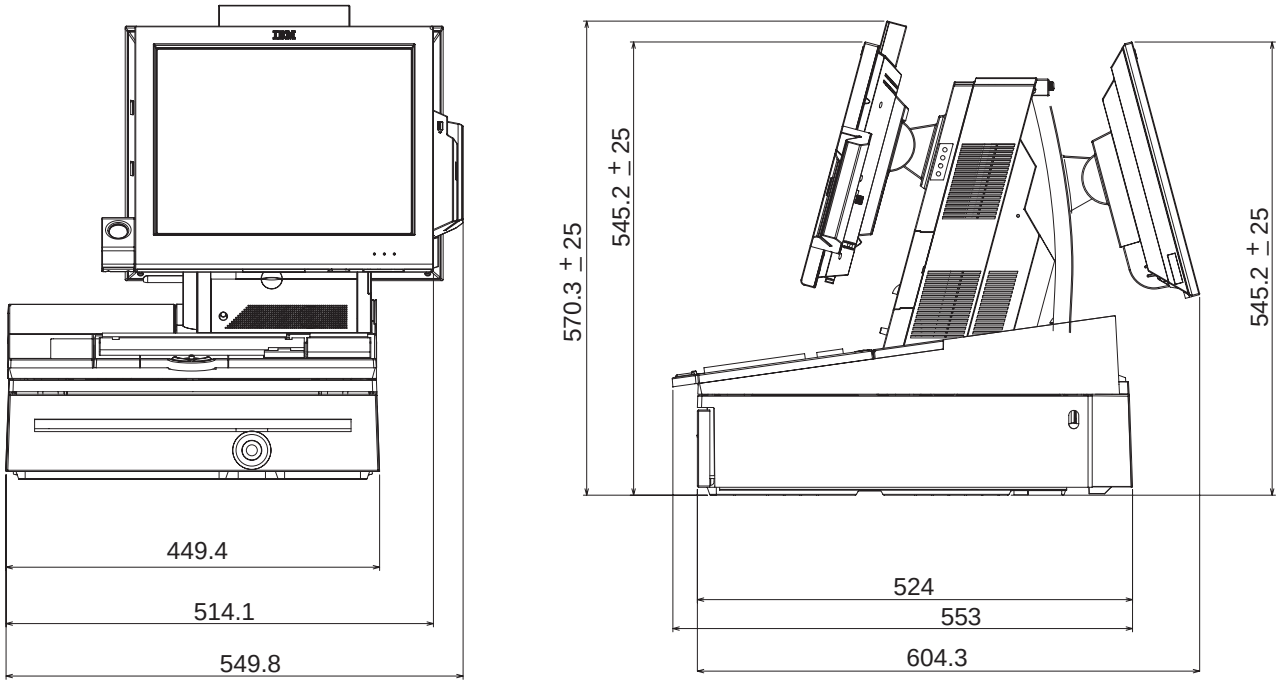


Figure 83. SurePOS 500 Models 526, 566, and E2S with 4820 SurePoint Solution with integration tray. See Table 18 on page 131 for A and B dimensions.

Display tablet sign point dimensions

M3 x 8 screws can be used.

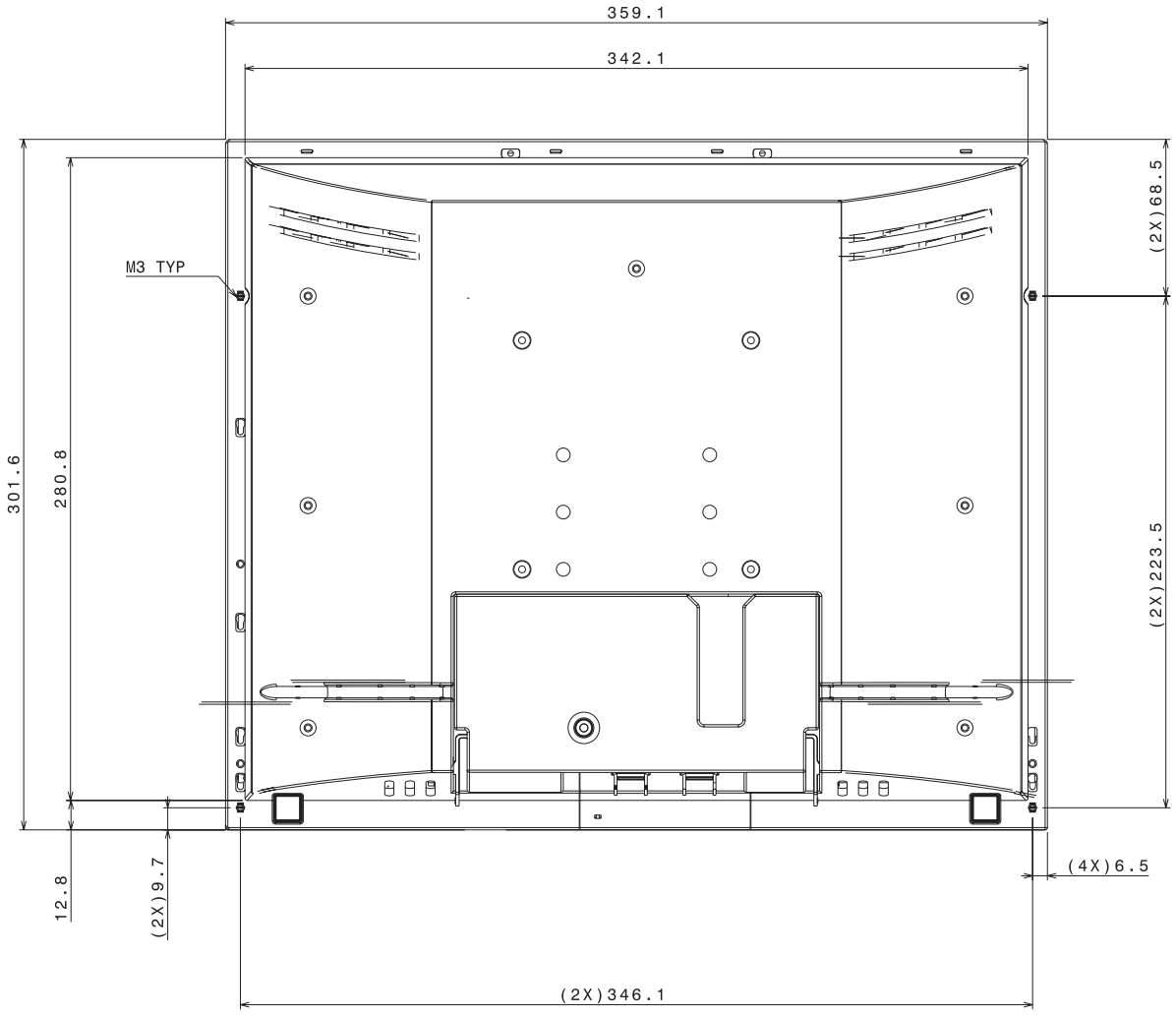


Figure 84. Display tablet sign point dimensions

6.5 display sign point dimensions

M3 x 10 screws can be used.

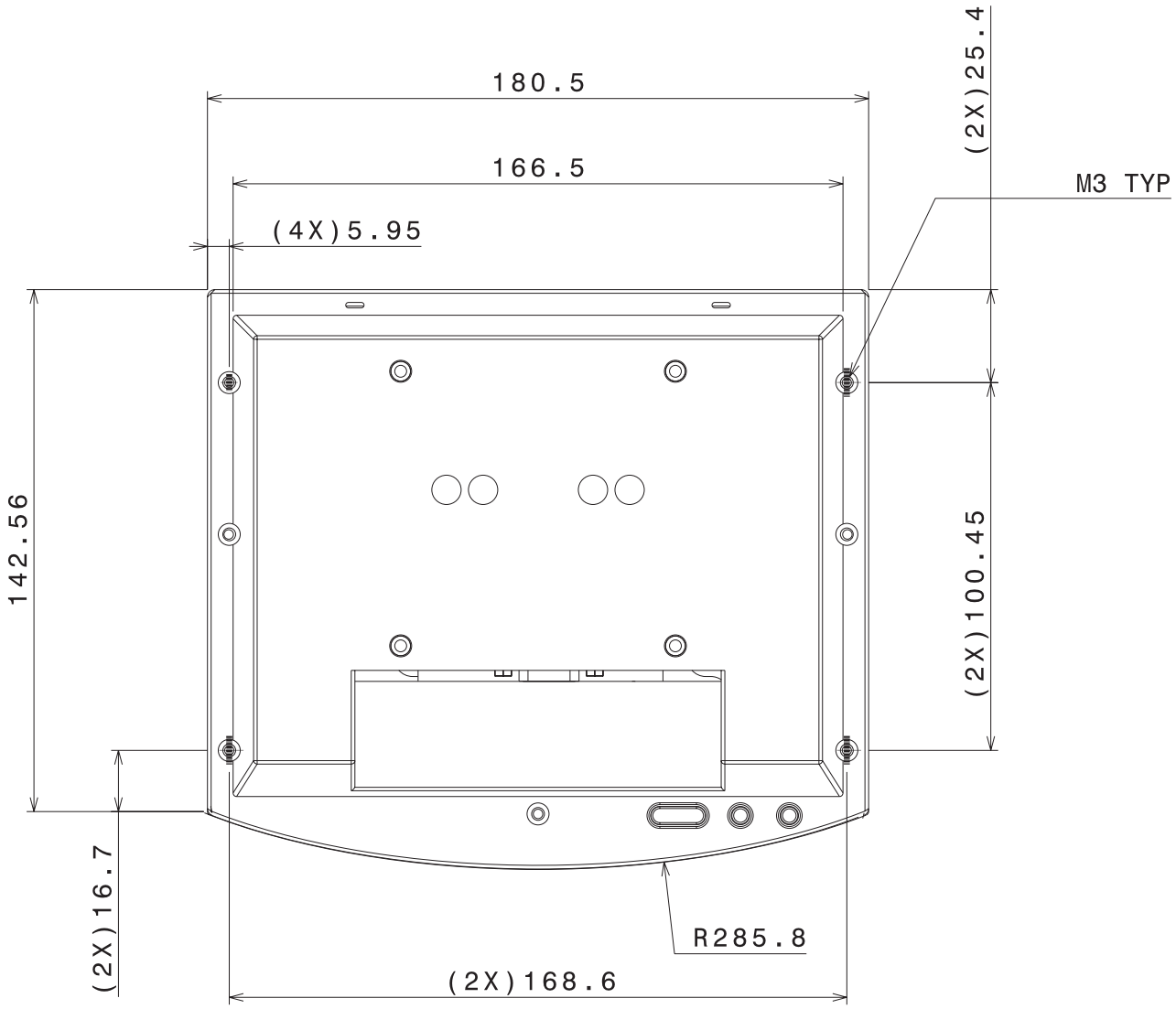


Figure 85. 6.5 display sign point dimensions

Power requirements and consumption

This section describes the power requirements and power consumption of the SurePOS 500 Series.

Power

Table 19. Input voltage, frequency

Input	Frequency
100 – 127 V AC	50 or 60 Hz
200 – 240 V AC	50 or 60 Hz

Table 20. SurePOS 500 Models 526, 566, and E2S power supply

Nominal output voltage	Tolerance	Rated Current
+5.0 V AUX	±5%	2.0 A
+5.0 V MAIN	+5/-4%	8.0 A
+12.0 V	±5%	12.0 A
+3.3 V	±5%	6.0 A
-12.0 V	±10%	0.3 A
+25.3 V	±4%	3.0 A

Table 21. Power consumption

State:	Usage:	
	Model 566	Models 526 and E2S
Off	2 W	2 W
Standby	30 W	20 W
Suspend to RAM (S3), no POS I/O	2 W	2 W
On (idle, no POS I/O)	45 W	35 W
On (idle, I/O: cash drawer, MSR, 2/20, printer)	50 W	40 W
On (max)	100 W	45 W
Input	100 - 127, 200 - 240 V AC (nominal), 50 or 60 Hz (+/- 3 Hz)	
Voltage/Frequency	Sinusoidal, trapezoidal, or square wave inputs	
Maximum kVA	0.3	
AC Input	IEC 320 C14, unshielded right angle type	
Leakage Current	3.5 ma maximum	

Port power ratings

- Only one cash drawer may be activated at any instance in time.
- Hot plugging of powered USB devices, especially printers, is not supported. Some powered USB devices create surge currents that may cause the system power supply to initiate over-current shut down.

  Note: All ports provide protection against power surges.

Table 22. Port current ratings

Port/name	Port voltage ratings	Maximum current
Distributed VFD/serial	5 V	0.95 A
	12 V	0.65 A
USB (x6)	5 V	0.5 A
USB plus power	5 V	0.5 A
	12 V	1.5 A
	24 V	3.0 A continuous
		5.0 A surge
Keyboard and mouse	5 V	0.6 A
3A, 3B/cash drawer	24 V	1 A for 200 msec

Connector-pin assignments

The following sections list the connector-pin assignments for the external and internal connectors.

External connectors

The following sections show the connector-pin assignments for external connectors.

Speaker connector

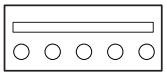


Table 23. Speaker connector-pin assignments

Pin	Connect
1	+12 V DC
2	Ground
3	Line Left
4	Line Right
5	Ground

MSR connector

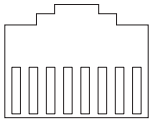


Table 24. MSR connector-pin assignments

Pin	Connector
1	+5 V dc
2	Serial data out
3	Serial data in

Table 24. MSR connector-pin assignments (continued)

Pin	Connector
4	Ground
5	Keyboard enable
6	Keyboard data
7	Keyboard clock
8	Ground

USB port connectors

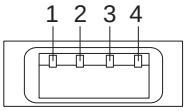


Table 25. USB port connector-pin assignments

Unpowered USB	
Pin	**Connector**
1	5 V bus
2	−Data
3	+Data
4	Ground

Note: Tablet USB ports are USB 2.0 compliant; side and back USB ports are USB 2.0 compliant.

Table 26. USB port connector-pin assignments

Powered USB	
Pin	**Connector**
Shell	Shield
1	5 V Vbus
2	−Data
3	+Data
4	Ground
5	Ground
6	Vplus (12 V or 24 V)
7	Vplus (12 V or 24 V)
8	Ground

Keyboard connector

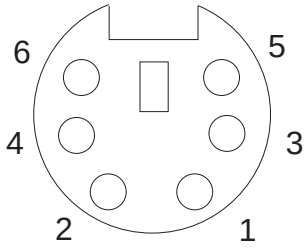


Table 27. Keyboard connector-pin assignments

Pin	Signal	I/O
1	Keyboard data	I/O
3	Ground	
4	+5 V main	I/O
5	Keyboard clock	

Mouse connector

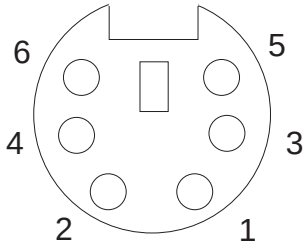


Table 28. Mouse connector-pin assignments

Pin	Signal	I/O
2	Mouse data	I/O
3	Ground	
4	+5 V Main	I/O
6	Mouse clock	

Microphone connector

The microphone connector is on the tower, at the lower left, below the side connector panel.

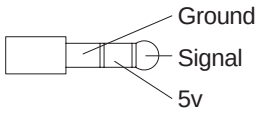


Table 29. Microphone connector-pin assignments

Pin	Signal
Tip	Input
Ring	+5 V
Base	Ground

Headphone connector

The headphone connector is on the tower, at the lower left, below the side connector panel, with the microphone connector.

Table 30. Headphone connector-pin assignments

Pin	Signal
Tip	Left channel audio
Ring	Right channel audio
Base	Ground

Serial connectors

9-pin serial connector (3): The 9-pin serial connector is a male connector.

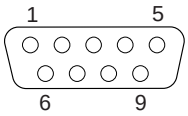


Table 31. Assignment for 9-pin serial connector

Pin	Signal	I/O	Pin	Signal	I/O
1	Carrier detect	I	6	Data set ready	I
2	Receive data	I	7	Request to send	O
3	Transmit data	O	8	Clear to send	I
4	Data terminal ready	O	9	Ring indicator	I
5	Signal ground				

Ethernet connector

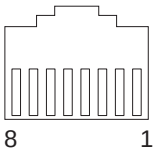


Table 32. Ethernet connector-pin assignments

Pin	Signal	I/O
1	TxD+	O
2	TxD−	O
3	RxD+	I
4	Ground	
5	Ground	
6	RxD−	I
7	Ground	
8	Ground	

External video connector

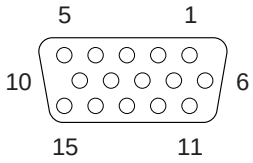


Table 33. Assignment of external-video connector pins

Pin	Connector	Pin	Connector
1	Red	9	No connection
2	Green	10	Ground
3	Blue	11	No connection
4	No connection	12	Monitor ID1
5	Ground	13	Horizontal sync
6	Red ground	14	Vertical sync
7	Green ground	15	Monitor ID3
8	Blue ground		

Cash drawer connector (2)

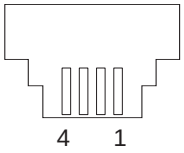


Table 34. Assignment of cash drawer connector pins

Pin	Connector
1	Ground
2	Sensor
3	Open
4	+24 V

Integrated customer display connector

To access this connector, refer to “Vacuum fluorescent display (VFD)” on page 72.

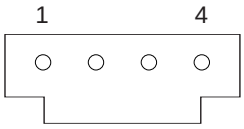


Table 35. Assignment of integrated customer-display connector pins

Pin	Connector
1	+5 V Main
2	Transmit data
3	VFD present
4	Ground

Temperature, humidity, and altitude limits

Table 36. Temperature, humidity, altitude limits

Condition	Temperature limits (dry bulb)	Relative Humidity	Maximum wet bulb temperature
Operating	5° to 40° C.	8% to 80%	27° C.
Power Off	0° to 52° C.	5% to 95%	27° C.
Storage	0° to 60° C.	5% to 100%	29° C.

This product is designed to operate up to 3050 m (10,000 ft.).

Appendix D. Safety information

Danger:
Before you begin to install this product, read the safety information in *IBM Safety Information — Read This First*, GA27-4004. This booklet describes safe procedures for cabling and plugging in electrical equipment.

Gevaar:
Voordat u begint met de installatie van dit produkt, moet u eerst de veiligheidsinstructies lezen in de brochure *Veiligheidsinstructies—Lees dit eerst*, GA27-4004. Hierin wordt beschreven hoe u electrische apparatuur op een veilige manier moet bekabelen en aansluiten.

Perigo:
Antes de começar a instalar este produto, leia as informações de segurança contidas em *Informações Sobre Seguranaça—Leia Isto Primeiro,* GA27-4004. Esse folheto descreve procedimentos de segurança para a instalação de cabos e conexões em equipamentos elétricos.

Fare!
Før du installerer dette produkt, skal du læse sikkerhedsforskrifterne i *Sikkerhedsforskrifter—Lœs dette først* GA27-4004. Vejledningen beskriver den fremgangsmåde, du skal bruge ved tilslutning af kabler og udstyr.

Gevaar

Voordat u begint met het installeren van dit produkt, dient u eerst de veiligheidsrichtlijnen te lezen die zijn vermeld in de publikatie *IBM Safety Information — Read This First*, GA27-4004. In dit boekje vindt u veilige procedures voor het aansluiten van elektrische appratuur.

VAARA

Ennen kuin aloitat tämän tuotteen asennuksen, lue julkaisussa *Turvaohjeet—Luetämä ensin*, GA27-4004, olevat turvaohjeet. Tässä kirjasessa on ohjeet siitä, miten sähkölaitteet kaapeloidaan ja kytketään turvallisesti.

Danger

Avant d'installer le présent produit, consultez le livret *Informations pour la sécurité–Lisez-moi d'abord*, GA27-4004, qui décrit les procédures à respecter pour effectuer les opérations de câblage et brancher les équipements électriques en toute sécurité.

Vorsicht

Bevor mit der Installation des Produktes begonnen wird, die Sicherheitshinweise in *Sicherheitsinformationen—Bitte zuerst lesen,* IBM Form GA27-4004. Diese Veröffentlichung beschreibt die Sicherheitsvorkehrungen für das Verkabeln und Anschlie*ß*en elektrischer Geräte.

Vigyázat

Mielôtt megkezdi a berendezés üzembe helyezését, olvassa el a *IBM Safety Information — Read This First*, GA27-4004 könyvecskében leírt biztonsági információkat. Ez a könyv leírja, milyen biztonsági intézkedéseket kell megtenni az elektromos berendezés huzalozásakor illetve csatlakoztatásakor.

Pericolo

prima di iniziare l'installazione di questo prodotto, leggere le informazioni relative alla sicurezza riportate nell'opuscolo *Informazioni di sicurezza—Prime informazioni da leggere* in cui sono descritte le procedure per il cablaggio ed il collegamento di apparecchiature elettriche.

Fare

Før du begynner å installere dette produktet, må du lese sikkerhetsinformasjonen i *Sikkerhetsinformasjon—Les dette først,* GA27-4004 som beskriver sikkerhetsrutinene for kabling og tilkobling av elektrisk utstyr.

Perigo

Antes de iniciar a instalação deste produto, leia as informações de segurança *Informações de Segurança—Leia Primeiro,* GA27-4004. Este documento descreve como efectuar, de um modo seguro, as ligações eléctricas dos equipamentos.

Peligro

Antes de empezar a instalar este producto, lea la información de seguridad en *Información de Seguridad—Lea Esto Primero,* GA27-4004. Este documento describe los procedimientos de sequridad para cablear y enchufar equipos eléctricos.

Varning—livsfara

Innan du börjar installera den här produkten bör du läsa säkerhetsinformationen i dikumentet *Säkerhetsföreskrifter—Läs detta först,* GA27-4004. Där beskrivs hur du på ett säkert sätt ansluter elektrisk utrustning.

危險：安裝本產品之前， 請先閱讀
"IBM Safety Information--Read
This First" GA27-4004 手冊中所提
供的安全注意事項。 這本手冊將會說明
使用電器設備的纜線及電源的安全程序。

Opasnost: Prije nego sto počnete sa instalacijom produkta,
pročitajte naputak o pravilima o sigurnom rukovanju u
Upozorenje: Pravila o sigurnom rukovanju - Prvo pročitaj ovo,
GA27-4004. Ovaj privitak opisuje sigurnosne postupke za
priključrivanje kabela i priključivanje na električno napajanje.

Upozornění: než zahájíte instalaci tohoto produktu, přečtěte si
nejprve bezpečnostní informace v pokynech „ Bezpečnostní
informace“ č. GA27-4004. Tato brožurka popisuje bezpečnostní
opatření pro kabeláž a zapojení elektrického zařízení.

Κίνδυνος: Πριν ξεκινήσετε την εγκατάσταση αυτού του προϊόντος,
διαβάστε τις πληροφορίες ασφάλειας στο φυλλάδιο *IBM Safety
Information-Read this first,* GA27-4004. Στο φυλλάδιο αυτό
περιγράφονται οι ασφαλείς διαδικασίες για την καλωδίωση των
ηλεκτρικών συσκευών και τη σύνδεσή τους στην πρίζα.

危険： 導入作業を開始する前に、安全に関する
小冊子 GA27-4004 の「最初にお読みください」
(Read This First)の項をお読みください。
この小冊子は、電気機器の安全な配線と接続の
手順について説明しています。

위험: 이 제품을 설치하기 전에 반드시
"주의: 안전 정보-시작하기 전에"
(GA27-4004) 에 있는 안전 정보를
읽으십시오.

סכנה: לפני שמתחילים בהתקנת מוצר זה, יש לקרוא את הוראות הבטיחות בחוברת
Caution: Safety Information - Read This First, GA27-4004
חוברת זו מתארת את הוראות הבטיחות לחיבור הכבלים ולחיבור לחשמל של ציוד חשמלי.

خطـــر: قبـــل عمـــلية بـــدء تركيـــب هذا المنتـــج، قم بقراءة معلومـــات
الحمـــاية الموجودة في التحذيـــر: معلومـــات الحمـــاية – Read This First،
GA27-4004 . يقـــوم هذا الكتيـــب بوصـــف اجـــراءات الآمـــان
لتوصـــيل الأدوات الكـــهربائية بالكـــابلات والمقبـــس الكـــهربائـــي.

ОПАСНОСТ
Пред да почнете да го инсталирате овој продукт, прочитајте ја информацијата за безбедност:
"Предупредување: Информација за безбедност: Прочитајте го прво ова", GA27-4004.
Оваа брошура опишува безбедносни процедури за каблирање и вклучување на електрична опрема.

Uwaga:
Przed rozpoczęciem instalacji produktu należy zapoznać się z instrukcją:
"IBM Safety Information - Read This First", GA27-4004.
Zawiera ona warunki bezpieczeństwa przy podłączaniu do sieci elektrycznej i eksploatacji.

ОСТОРОЖНО: Прежде чем инсталлировать этот продукт, прочтите Инструкцию по технике безопасности в документе "Внимание: Инструкция по технике безопасности -- Прочесть в первую очередь", GA27-4004. В этой брошюре описаны безопасные способы каблирования и подключения электрического оборудования.

Nebezpečenstvo: Pred inštaláciou výrobku si prečítajte bezpečnosté predpisy v
Výstraha: Bezpeč osté predpisy - Prečítaj ako prvé, GA27-4004. V tejto brožúrke sú opísané bezpečnosté postupy pre pripojenie elektrických zariadení.

Pozor: Preden zaènete z instalacijo tega produkta preberite poglavje: 'Opozorilo: Informacije o varnem rokovanju-preberi pred uporabo," GA27-4004. To poglavje opisuje pravilne postopke za kabliranje,

危險：

開始安裝此產品之前，請先閱讀安全資訊。

注意：

請先閱讀 - 安全資訊 GA27-4004

此冊子說明插接電器設備之電纜線的安全程序。

危险：
在开始安装本产品之前，请阅读
IBM Safety Information - Read This First，
GA27-4004 中的安全信息。
此手册描述了如何安全地连接和插拔电气设备。

Appendix E. Notices

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Electronic emission notices

Federal Communications Commission (FCC) statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Community contact:

IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 785 1283
E-mail: tjahn@de.ibm.com

Industry Canada Class A Emission Compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité aux normes d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Germany

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richlinie 89/336).

Dieses Gerät ist berechtigt in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die

IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082–1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

″Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maβnahmen durchzuführen und dafür aufzukommen.″

EN 50082–1 Hinweis:

″Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082–2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern.″

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

Australia and New Zealand

Attention: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Chinese Class A warning statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

中华人民共和国“A 类”警告声明

声 明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Japanese power line harmonics compliance statement

高調波ガイドライン適合品

高調波ガイドライン適合品

Japanese Voluntary Control Council for Interference (VCCI) statement

Attention: This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Technology Equipment (VCCI). In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Korean communications statement

Please note that this device has been approved for business purposes with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for a non-business purpose one.

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이 기기는 업무용으로 전자파적합등록을 받은 기기이오니 판매자 또는 이용자는 이점을 주의하시기 바라며, 만약 구입하였을 때에는 구입한 곳에서 가정용으로 교환하시기 바랍니다.

Taiwanese Class A warning statement

警告使用者:
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Taiwan contact information

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

IBM Taiwan Product Service Contact Info:
IBM Taiwan Corporation
3F, No 7, Song Ren Road, Taipei Taiwan
Telephone: 0800-016-888

Cable ferrite requirement

All cable ferrites are required to suppress radiated EMI emissions and must not be removed.

Electrostatic Discharge (ESD)

Attention: ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

Product Recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.

Español:
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Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège. L'etiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques

(DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

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In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Disposal of IT products should be in accordance with local ordinances and regulations.

Battery return program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

For Taiwan:

Please recycle batteries.

For the European Union:

Notice: This mark applies only to countries within the European Union (EU)

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

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In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances. For proper collection and treatment, contact your local IBM representative.

This notice is provided in accordance with Royal Decree 106/2008 of Spain: The retail price of batteries, accumulators and power cells includes the cost of the environmental management of their waste.

For California:

Perchlorate material – special handling may apply

Refer to http://www.dtsc.ca.gov/hazardouswaste/perchlorate.

The foregoing notice is provided in accordance with *California Code of Regulations Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials*. This product/part includes a lithium manganese dioxide battery which contains a perchlorate substance.

Flat panel displays

The fluorescent lamp in the liquid crystal display contains mercury. Dispose of it as required by local ordinances and regulations.

Monitors and workstations

Connecticut - Please see the web site of the Department of Environmental Protection at http://www.ct.gov/dep for information about recycling covered electronic devices in the State of Connecticut, or telephone the Connecticut Department of Environmental Protection at 1-860-424-3000.

Oregon - For information regarding recycling covered electronic devices in the state of Oregon, go to the Oregon Department of Environmental Quality site at http://www.deq.state.or.us/lq/electronics.htm.

Washington - For information about recycling covered electronic devices in the State of Washington, go to the Department of Ecology Web site at https://fortress.wa.gov/ecy/recycle/ or telephone the Washington Department of Ecology at 1-800Recycle.

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A

active. (1) Able to communicate on the network. A token-ring network adapter is active if it is able to transmit and receive on the network (2) Operational. (3) Pertaining to a node or device that is connected or is available for connection to another node or device. (4) Currently transmitting or receiving.

adapter. (1) In the point-of-sale terminal, a circuit card that, with its associated software, enables the terminal to use a function or feature. (2) In a LAN, within a communicating device, a circuit card that, with its associated software and/or microcode, enables the device to communicate over the network.

address. (1) In data communication, the IEEE-assigned unique code or the unique locally administered code assigned to each device or workstation connected to a network. (2) A character or group of characters that identifies a register, a particular part of storage, or some other data source or destination. (A) (3) To refer to a device or an item of data by its address. (I) (A) (4) The location in the storage of a computer where data is stored.

addressing. (1) The assignment of addresses to the instructions of a program. (2) In data communication, the way in which a station selects the station to which it is to send data.

alphanumeric. Pertaining to data consisting of letters, digits, and usually other characters, such as punctuation marks. (T) (A)

analog. (1) Pertaining to data consisting of continuously variable physical quantities. (A) (2) Contrast with *digital*.

application. (1) A collection of one or more programs that work together to accomplish goals for a business. (2) A set of executable files and data files required to perform a desired function, which can consist of multiple programs running on different workstations.

architecture. A logical structure that encompasses operating principles including services, functions, and protocols. See *network architecture*.

attach. (1) To connect a device physically. (2) To make a device a part of a network logically. Compare with *connect*.

attaching device. Any device that is physically connected to a network and can communicate over the network.

B

bit. Either of the digits 0 or 1 when used in the binary numeration system. Synonymous with binary digit. (T)

bus. (1) In a processor, a physical facility on which data is transferred to all destinations, but from which only addressed destinations may read in accordance with appropriate conventions. (2) A network configuration in which nodes are interconnected through a bidirectional transmission medium. (3) One or more conductors used for transmitting signals or power. (A)

C

cash drawer. An optional I/O device attached to a point-of-sale terminal. The cash drawer contains a till. The cash drawer will open upon receiving a command. See *till*.

CPU. The central processing unit of a computer.

circuit. (1) A logic device. (2) One or more conductors through which an electric current can flow.

cluster. (1) A station that consists of a control unit (a cluster controller) and the terminals attached to it. (2) A group of APPN nodes that have the same network ID and the same topology database. A cluster is a subset of a NETID subnetwork. (3) In high-availability cluster multiprocessing (HACMP), a set of iindependent systems (called nodes) that are organized into a

network for the purpose of sharing resources and communicating with each other.

collision. (1) An unwanted condition that results from concurrent transmissions on a channel. (T) (2) When a frame from a transmitting adapter encounters any other signal in its path (frame, noise, or another type of signal), the adapter stops transmitting and a collision is registered.

command. (1) A request for performance of an operation or execution of a program. (2) A character string from a source external to a system that represents a request for system action.

component. (1) Any part of a network other than an attaching device, such as an IBM 8228 Multistation Access Unit. (2) Hardware or software that is part of a functional unit.

configuration. (1) The devices and programs that make up a system, subsystem, or network. (A) See also *system configuration*. (2) In the IBM StorePlace Distributed Data Services for OS/2, program options that are initially set at installation, and that can be changed later. Changing these options requires an IPL. These changes must be performed by a programmer or store operations personnel. These options are used to tune the product's use of the operating system and machine resources.

connect. In a LAN, to physically join a cable from a station to an access unit or network connection point. Contrast with *attach*.

controller. A unit that controls input/output operations for one or more devices.

cursor. A movable point of light (or a short line) that indicates where the next character is to be entered on the display screen.

D

data. (1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by human or automatic means. (I) (A) (2) Any representations such as characters or analog quantities to which meaning is or might be assigned. (A)

data file. A collection of related data records organized in a specific manner; for example, a payroll file (one record for each employee, showing such information as rate of pay and deductions) or an inventory file (one record for each inventory item, showing such information as cost, selling price, and number in stock.) See also *data set, file*.

data processing system. A system, including computer systems and associated personnel, that performs input, processing, storage, output, and control functions to accomplish a sequence of operations on data. (A) (I)

data set. Logically related records treated as a single unit. See also *file*.

DBCS. See *double-byte character set*.

device. (1) A mechanical, electrical, or electronic contrivance with a specific purpose. (2) An input/output unit such as a terminal, display, or printer. See also *attaching device*.

diagnostic diskette. A diskette containing diagnostic modules or tests used by computer users and service personnel to diagnose hardware problems.

diagnostics. Modules or tests used by computer users and service personnel to diagnose hardware problems.

digital. (1) Pertaining to data in the form of digits. (A) Contrast with *analog*. (2) Pertaining to data consisting of numerical values or discrete units.

DIP switch. A two-position switch on a circuit board that is preset to control certain functions. The user can change the position of a DIP switch to satisfy special requirements.

disk. A round, flat, data medium that is rotated in order to read or write data. (T) See also *diskette, hard-disk drive*.

disk operating system (DOS). A computer operating system that can perform only one task at a time.

diskette. A thin, flexible magnetic disk permanently enclosed in a protective jacket. A diskette is used to store information for processing.

diskette drive. The mechanism used to seek, read, and write data on diskettes.

display. (1) A visual presentation of data. (2) A device that presents visual information to the point-of-sale terminal operator and to the customer.

distributed. Physically separate but connected by cables.

DOS. See *disk operating system*.

double-byte character set (DBCS). A set of characters in which each character is represented by 2 bytes. Languages such as Japanese, Chinese, and Korean, which contain more symbols than can be represented by 256 code points, require double-byte character sets. Because each character requires 2 bytes, the typing, display, and printing of DBCS characters requires hardware and programs that support DBCS. Contrast with *single-byte character set*.

DRAM. Dynamic RAM. See *RAM*.

driver. A software component that controls a device.

dump. (1) To record, at a particular instant, the contents of all or part of one storage device in another storage device. Dumping is usually for the purpose of debugging. (T) (2) Data that has been dumped. (T)

DVD-ROM. Digital-video-disk read-only memory.

E

error message. A message that is issued because an error has been detected.

F

FCC. See *Federal Communications Commission.*

feature. A part of an IBM product that may be ordered separately by the customer.

Federal Communications Commission (FCC). A board of commissioners appointed by the President under the Communications Act of 1934, having the power to regulate all interstate and foreign communications by wire and radio originating in the United States.

field. On a data medium or a storage medium, a specified area used for a particular category of data; for example, a group of character positions used to enter or display wage rates on a panel. (T)

file. A named set of records stored or processed as a unit. (T) For example, an invoice may form a record and the complete set of such records may form a file. See also *data set*.

.

FSB. Another name for the system bus. The system bus is also called the frontside bus, memory bus, local bus, or host bus.

flash memory. A data-storage device that is programmable, erasable, and does not require continuous power. The chief benefit of flash memory over other programmable and erasable data storage devices is that it can be reprogrammed without being removed from the circuit board.

formatted diskette. A diskette on which track and sector control information has been written and that can be used by the computer to store data. **Note:** A diskette must be formatted before it can receive data.

frame . (1) The unit of transmission in some LANs, including the IBM Token-Ring Network and the IBM PC Network. It includes delimiters, control characters, information, and checking characters. On a token-ring network, a frame is created from a token when the token has data appended to it. On a token-bus network (IBM PC Network), all frames including the token frame contain a preamble, start delimiter, control address, optional data and checking characters, end delimiter, and are followed by a minimum silence period. (2) A housing for machine elements. (3) In synchronous data link control (SDLC), the vehicle for every command, every response, and all information that is transmitted using SDLC procedures. Each frame begins and ends with a flag.

function. (1) A specific purpose of an entity, or its characteristic action. (A) (2) In data communications, a machine action such as a carriage return or line feed. (A)

G

Ghz. The abbreviation for gigahertz. One GHz represents 1 billion cycles per second. The speed of microprocessors, called the clock speed, often is measured in gigahertz.

H

hard-disk drive. In a personal computer system unit, a disk storage device that reads and writes on rigid magnetic disks. It is faster and has a larger storage capacity than a diskette and is permanently installed. Synonymous with *fixed disk*.

HID. See *human interface devices*.

hot pluggable. Refers to a hardware component that can be installed or removed without disturbing the operation of any other resource that is not connected to, or dependent on, this component.

human interface devices (HID). Devices which allow humans to interact and communicate with a computer. Examples are a keyboard or a mouse.

hot plugging. Process of installing connections to the serial bus while the system is running and without powering down.

hot unplugging. Process of removing connections from the serial bus while the system is running and without powering down.

hypertext. (1) A method of presenting text in discrete units, or nodes, that are connected by links for navigation. (2) Text designed to be read or accessed in a nonlinear manner using nodes that are connected by links for navigation.

I

I/O. See *input/output*.

I/O device. A device in a data processing system by means of which data can be entered into the system, received from the system, or both. (I) (A)

IBM Disk Operating System (DOS) . A disk operating system based on MS-DOS that operates with all IBM-compatible personal computers.

IEEE. Institute of Electrical and Electronics Engineers.

input/output (I/O). (1) Pertaining to a device whose parts can perform an input process and an output process at the same time. (I) (2) Pertaining to a functional unit or channel involved in an input process, output process, or both, concurrently or not, and to the data involved in such a process.

integrated. Arranged together as one unit.

interference. (1) The prevention of clear reception of broadcast signals. (2) The distorted portion of a received signal.

interrupt. (1) A suspension of a process, such as execution of a computer program, caused by an external event and performed in such a way that the process can be resumed. (A) (2) To stop a process in such a way that it can be resumed. (3) A means of passing processing control from one software or microcode module or routine to another, or of requesting a particular software, microcode, or hardware function.

J

jabber. Transmission by a data station beyond the time interval allowed by the protocol. (T)

K

K. When referring to storage capacity, a symbol that represents two to the tenth power, or 1024.

keyboard. A group of numeric keys, alphabetic keys, special character keys, or function keys used for entering information into the terminal and into the system.

L

LAN. See *local area network*.

LAN adapter. The circuit card within a communicating device (such as a personal computer) that, together with its associated software, enables the device to be attached to a LAN.

LED. Light-emitting diode.

light-emitting diode (LED). A semiconductor chip that gives off visible or infared light when activated.

line. On a terminal, one or more characters entered before a return to the first printing or display position.

link. (1) The logical connection between nodes including the end-to-end link control procedures. (2) The combination of physical media, protocols, and programming that connects devices on a network. (3) In computer programming, the part of a program, in some cases a single instruction or an address, that passes control and parameters between separate portions of the computer program. (4) To interconnect items of data or portions of one or more computer programs. (5) In SNA, the combination of the link connection and link stations joining network nodes. See also *link connection*. **Note:** A link connection is the physical medium of transmission; for example, a telephone wire or a microwave beam. A link includes the physical medium of transmission, the protocol, and associated devices and programming; it is both logical and physical.

link connection. (1) All physical components and protocol machines that lie between the communicating link stations of a link. The link connection may include a switched or leased physical data circuit, a LAN, or an X.25 virtual circuit. (2) In SNA, the physical equipment providing two-way communication and error correction and detection between one link station and one or more other link stations. (3) In the IBM Store System, the logical link providing two-way communication of data from one network node to one or more other network nodes.

load. In computer programming, to enter data into memory or working registers.

local area network (LAN). A computer network located on a user's premises within a limited geographical area. **Note:** Communication within a LAN is not subject to external regulations; however, communication across the LAN boundary may be subject to some form of regulation.

logon. The procedure for starting up a point-of-sale terminal or store controller for normal sales operations by sequentially entering the correct security number and transaction number. Synonymous with *sign-on*.

M

magnetic ink character reader (MICR). An input unit that reads characters by magnetic ink character recognition. (A)

magnetic ink character recognition. (1) MICR. Character recognition of magnetic ink characters. (T) (2) The identification of characters through the use of magnetic ink.

MB. See *megabyte*.

Mbps. One million bits per second.

megabyte (MB) . A unit of measure for data. 1 megabyte = 1 048 576 bytes.

memory. Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent execution or processing.

memory key. A USB removable storage device.

message. (1) An arbitrary amount of information whose beginning and end are defined or implied. (2) A group of characters and control bit sequences transferred as an entity. (3) In telecommunication, a combination of characters and symbols transmitted from one point to another. (4) A logical partition of the user device's data stream to and from the adapter. See also *error message*, *operator message*.

MICR. See magnetic ink character reader and magnetic ink character recognition.

module. A program unit that is discrete and identifiable with respect to compiling, combining with other units, and load; for example, the input to, or output from, an assembler, compiler, linkage editor, or executive routine.

N

network. (1) A configuration of data processing devices and software connected for information interchange. (2) An arrangement of nodes and connecting branches. Connections are made between data stations.

network architecture. The logical structure and operating principles of a computer network. **Note:** The operating principles of a network include those of services, functions, and protocols.

noise. (1) A disturbance that affects a signal and that can distort the information carried by the signal. (2) Random variations of one or more characteristics of any entity, such as voltage, current, or data. (3) Loosely, any disturbance tending to interfere with normal operation of a device or system.

nonvolatile random access memory (NVRAM) . Random access memory that retains its contents after electrical power is shut off. Contrast with *volatile memory*.

NVRAM. See nonvolatile random access memory.

O

operating system. Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementations are possible. (T)

Operating System/2® (OS/2®). A set of programs that control the operation of high-speed large-memory IBM Personal Computers providing multitasking. Contrast with *Disk Operating System (DOS)*.

operator. A person who operates a machine.

operator message. A message from the operating system or a program telling the operator to perform a specific function or informing the operator of a specific condition within the system, such as an error condition.

option. (1) A specification in a statement, a selection from a menu, or a setting of a switch, that can be used to influence the execution of a program. (2) A hardware or software function that can be selected or enabled as part of a configuration process. (3) A piece of hardware (such as a network adapter) that can be installed in a device to modify or enhance device function.

OS. Operating system.

OS/2. Operating System/2.

P

page. The information displayed at the same time on the screen of a display device.

panel. (1) A thin flat sheet, usually (a) of pressed metal and carrying controls and indicators, (b) of glass, or (c) of plastic. (2) A formatted display of information that appears on a display screen.

parallel port. A port that transmits the bits of a byte in parallel along the lines of the bus, one byte at a time, to an I/O device. On a personal computer, it is used to connect a device that uses a parallel interface, such as a dot matrix printer, to the computer. Contrast with *serial port*.

PC. See *personal computer*.

personal computer (PC). A desk-top, free-standing, or portable microcomputer that usually consists of a system unit, a display, a keyboard, one or more diskette drives, internal fixed-disk storage, and an optional printer. PCs are designed primarily to give independent computing power to a single user and are inexpensively priced for purchase by individuals or small businesses. Examples include the various models of the IBM Personal Computers.

plug. (1) A connector for attaching wires from a device to a cable, such as a store loop. A plug is inserted into a receptacle or plug. (2) To insert a connector into a receptacle or socket.

Plug and Play (PnP). Pertaining to the capability of a hardware or software component to be installed on a system with minimal effort and to be available for use immediately thereafter.

PnP. See *Plug and Play*.

point-of-sale (POS). A method of providing information to support sales and of collecting the resulting sales information from retail devices located in stores.

port. (1) An access point for data entry or exit. (2) A connector on a device to which cables for other devices such as display stations and printers are attached. Synonymous with *socket*.

POS. See *point-of-sale*.

POST . Power-on self-test.

power-on self-test (POST) . A series of diagnostic tests that are run automatically each time the computer's power is switched on.

problem determination. The process of determining the source of a problem; for example, a program component, machine failure, telecommunication facilities, user or contractor-installed programs or equipment, environmental failure such as a power loss, or user error.

procedure. (1) A set of related control statements that cause one or more programs to be performed. (2) A set of instructions that gives a service representative a step-by-step procedure for tracing a symptom to the cause of failure.

processor. In a computer, a functional unit that interprets and executes instructions. (A) (I)

protocol. (1) A set of semantic and syntactic rules that determine the behavior of functional units in achieving communication. (I) (2) A specification for the format and relative timing of information exchanged between communicating parties.

R

RAM. See *random access memory*.

random access memory (RAM). A computer's or adapter's volatile memory, which can be accessed nonsequentially.

read. To acquire or to interpret data from a storage device, from a data medium, or from another source. (I) (A)

real-time. (1) Pertaining to the actual time during which a physical process occurs. (2) Pertaining to data collected concurrently with physical events, so that the results of the collection operation may be used to influence the sequence of events.

receive. To obtain and store information transmitted from a device.

record. A collection of related items of data, treated as a unit; for example, in stock control, each invoice could constitute one record. A complete set of such records may form a file.

repeater. A device that amplifies or regenerates data signals in order to extend the range of transmission between devices in a network.

retail-hardened. Indicates that the system is designed and tested to withstand the heavy usage typically encountered in a retail environment. The system integrates technologies that minimize hardware and software failures so as to achieve a high rate of availability that is required of POS systems.

S

SBCS. See *single-byte character set*.

scanner. A device that examines the bar code on merchandise tickets, credit cards, and employee badges and generates analog or digital signals corresponding to the bar code.

serial port. On personal computers, a port used to attach devices such as display devices, letter-quality printers, modems, plotters, and pointing devices such as light pens and mice; it transmits data one bit at a time. Contrast with *parallel port*.

signal. A variation of a physical attribute, used to convey data. (A)

single-byte character set (SBCS). Single-byte character set. A character set in which each character is represented by a one-byte code. Contrast with *double-byte character set*.

socket. (1) An opening that holds something. (2) Synonym for *port*.

source. The origin of any data involved in a data transfer.

subsystem. A secondary or subordinate system, usually capable of operating independently of, or asynchronously with, a controlling system. (T)

switch. (1) A device for making and breaking electrical connections, for making a selection, or for requesting a function or operation. (2) On an adapter, a mechanism used to select a value for, enable, or disable a configurable option or feature.

system. (1) In data processing, a collection of people, machines, and methods organized to accomplish a set of specific functions. (I) (A) See also *data processing system*, *operating system*, and *system unit*. (2) In the IBM StorePlace Distributed Data Services for OS/2, a group of nodes for which files are managed.

system board. In a system unit, the main circuit board that supports a variety of basic system devices, such as a keyboard or a mouse, and provides other basic system functions.

system bus. The unit that connects the CPU to the main memory on the system board.

system configuration. A process that specifies the devices and programs that form a particular data processing system.

system unit. (1) A part of a computer that contains the processing unit and may contain devices such as disk and diskette drives. (2) In an IBM Personal Computer, the unit that contains the processor circuitry, read-only memory (ROM), random access memory (RAM), and the I/O channel. It may have one or more disk or diskette drives. (3) In an IBM Store System terminal, the part of the terminal that contains the processing unit, ROM, RAM, disk and diskette drives, and the I/O channel.

T

terminal. In data communication, a device, usually equipped with a keyboard and a display, that is capable of sending and receiving information.

till. A tray in the cash drawer of the point-of-sale terminal, used to keep the different denominations of bills and coins separated and easily accessible.

transmit. To send information from one place for reception elsewhere. (A)

twisted pair. A transmission medium that consists of two insulated electrical conductors twisted together. (A)

typematic. The ability of a key on a keyboard to repeatedly type a character as long as it is held down.

U

Universal Serial Bus (USB). A serial interface standard for telephony and multimedia connections to personal computers.

Universal Serial Bus (USB), powered. A powered-USB connector provides additional power from the host system. A powered-USB receptacle consists of two connectors stacked vertically inside the common housing. The upper connector contains four contacts that are used for powering the attached device.

Universal Serial Bus (USB), key. A small, portable flash memory card that plugs into a computer's USB port and functions as a portable hard drive. USB flash drives are small enough to be carried in a pocket and can plug into any computer with a USB drive. USB flash drives have less storage capacity than an external hard drive, but are smaller and more durable because they do not contain any internal moving parts.

unshielded twisted pair (UTP). One or more twisted pairs of copper wire in the unshielded voice-grade cable commonly used to connect a telephone to its wall jack.

user. (1) A category of identification defined for file access protection. (2) A person using a program or system.

USB. See *Universal Serial Bus*.

V

version . A separately licensed program that usually has significant new code or new function.

vital product data (VPD). Information about the computer, such as machine type and model or serial number, stored in the BIOS.

volatile memory. Memory that loses its contents when power is turned off.

VPD. See *vital product data*.

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