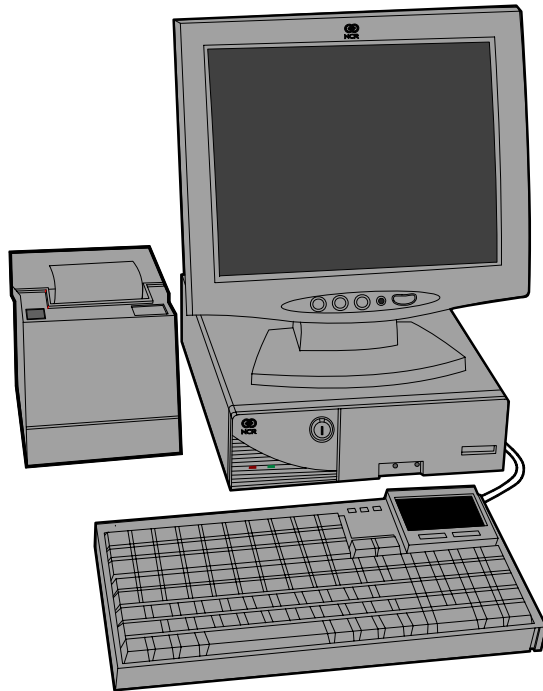


NCR RealPOS™ 30 (7446)

Release 2.1

User Guide



B005-0000-1551

Issue E

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To maintain the quality of our publications, we need your comments on the accuracy, clarity, organization, and value of this book.

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Preface

Audience

This book is written for hardware installer/service personnel, system integrators, and field engineers.

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References

- *NCR RealPOS 30 (7446) Site Preparation Guide*
(B005-0000-1552)
- *NCR RealPOS 30 (7446) Hardware Service Manual*
(B005-0000-1553)
- *NCR RealPOS 30 (7446) Parts Identification Manual*
(B005-0000-1554)
- *NCR 5932 USB Keyboard User's Guide*
(B005-0000-1395)
- *NCR 5942 12.1-Inch LCD Monitor User's Guide*
(B005-0000-1394)
- *NCR 5972 2 x 20 Customer Display User's Guide*
(B005-0000-1372)
- *NCR 5982 5-Inch LCD Operator Display User's Guide*
(BD20-1443-A)
- *NCR 7167 Two-Station POS Printer Owner's Guide*
(B005-0000-1406)
- *NCR 7162 Printer Setup & User's Guide*
(BD20-1453-A)
- *NCR 7197 Receipt Printer Owner's Guide*
(B005-0000-1409)
- *NCR 5945 Electronic Payment Terminal User's Guide*
(B005-0000-1104)
- *NCR 5992 Signature Capture User's Guide*
(B005-0000-1108)

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Appendix B: Memory Maps

Revision Record

Issue	Date	Remarks
A	Mar 2004	First issue
B	Feb 2006	Added Dual Display section
C	Mar 2006	Release 1.1; RoHS models
D	July 2006	Release 2.0
E	July 2007	Release 2.1; Charcoal Grey model

Safety and Regulatory Information

The NCR RealPOS 7443 conforms to all applicable legal requirements. To view the compliance statements see the *NCR RealPOS Terminals Safety and Regulatory Statements* (B005-0000-1589).

Chapter 1: Product Overview

Introduction

The NCR RealPOS 30 (also known as NCR 7446) is a compact POS solution that combines the reliability and security of a retail-hardened POS terminal with the performance and flexibility of industry-standard PC technology. With an open architecture and powerful Intel® processor, the NCR RealPOS 30 supports the latest POS applications for Windows® or Linux® to help you service your customers quickly and efficiently. And, it all fits in a small footprint that helps conserve valuable space at the Checkstand.

The versatile NCR RealPOS 30 can be configured as a diskless thin-client or a full-function disk-based POS system. To complete your POS solution, choose from NCR's extensive line of peripherals, including printers, displays, keyboards and scanners. As your requirements grow, a full-height PCI slot provides added flexibility to support new functionality such as wireless networking. The NCR RealPOS 30 enables you to protect your investment in legacy serial devices or choose from the growing list of USB peripherals. The powered peripheral ports and 24V printer interface simplify cable management and reduce potential points of failure.

What's New in Release 2.0

In this release, NCR introduces a new P4-class Series 3000 RealPOS 30 model with the following new features:

- A new motherboard supporting a faster 2.0GHz Intel Celeron processor, 256MB DDR memory and embedded Intel 845GV chipset.
- 24V powered USB port, replacing the dedicated 24V printer power port on previous Release 1.0/1.1 models. Users can now connect an NCR USB printer with a single powered USB cable already released for other NCR terminals, such as the RealPOS 80c
- A single 12V powered USB port, replacing one of the 12V RS-232 ports on previous models. This means more options when configuring terminal-powered peripherals on the RealPOS 30 terminal, and eliminates the need for a power brick when configuring an NCR 15" touch or 12" flat panel display.
- Optional internal CD-ROM upgrade kit, replacing the floppy disk drive standard on previous models.

What's New in Release 2.1

- Charcoal Grey model

Product IDs

The following table highlights the standard features and options available with the RealPOS 30 base Models:

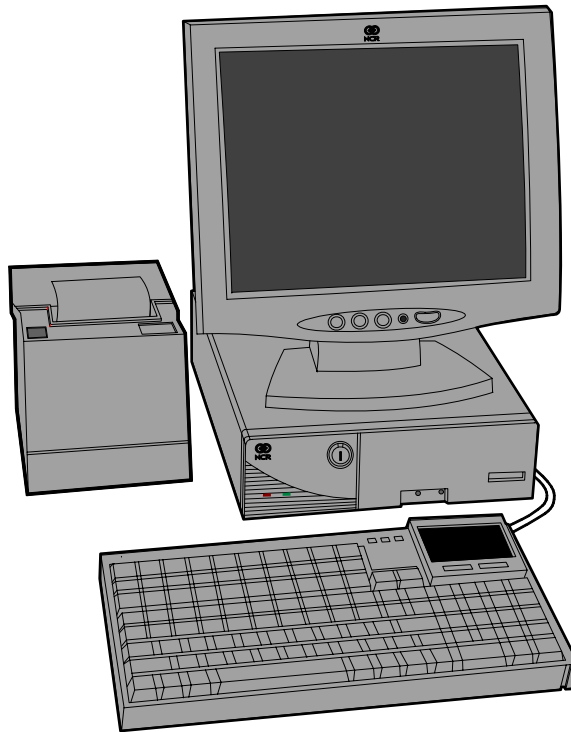
Major Model	CPU
7446-2110	Intel 1.2GHz Celeron, 256MB, 40GB HDD, FDD, G11
7446-3030	Intel 2.0 GHz Celeron, 256MB, 40GB HDD, G11
7446-3031	Intel 2.0 GHz Celeron, 256MB, 80GB HDD, CG1

Configuration

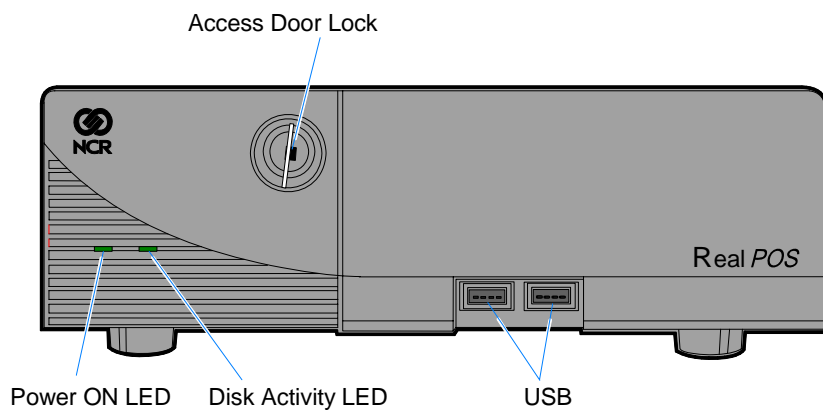
Modular Configuration

The RealPOS 30 is the smallest terminal cabinet in the RealPOS family. Integration options are limited to the 7446-K301 Rear Cable Cover, which offers support for an optional pole-mounted display.

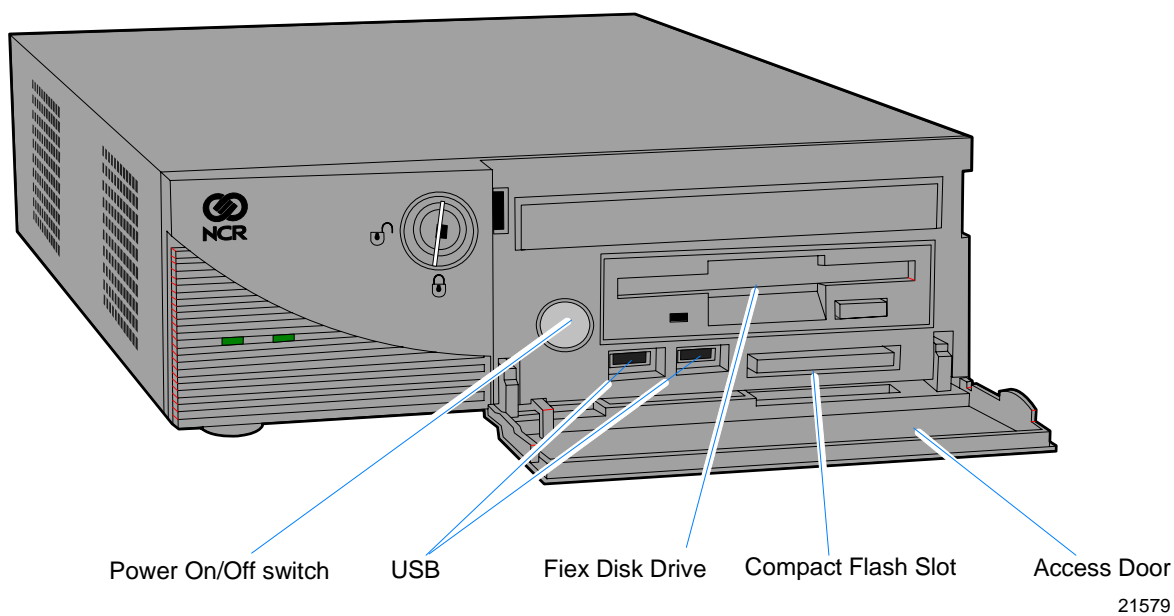
Note: The RealPOS 30 does not support unified configurations. The devices cannot be stacked on a single peripheral tray. Since the keyboard location is in front, this prevents the terminal from integrating on a cash drawer.



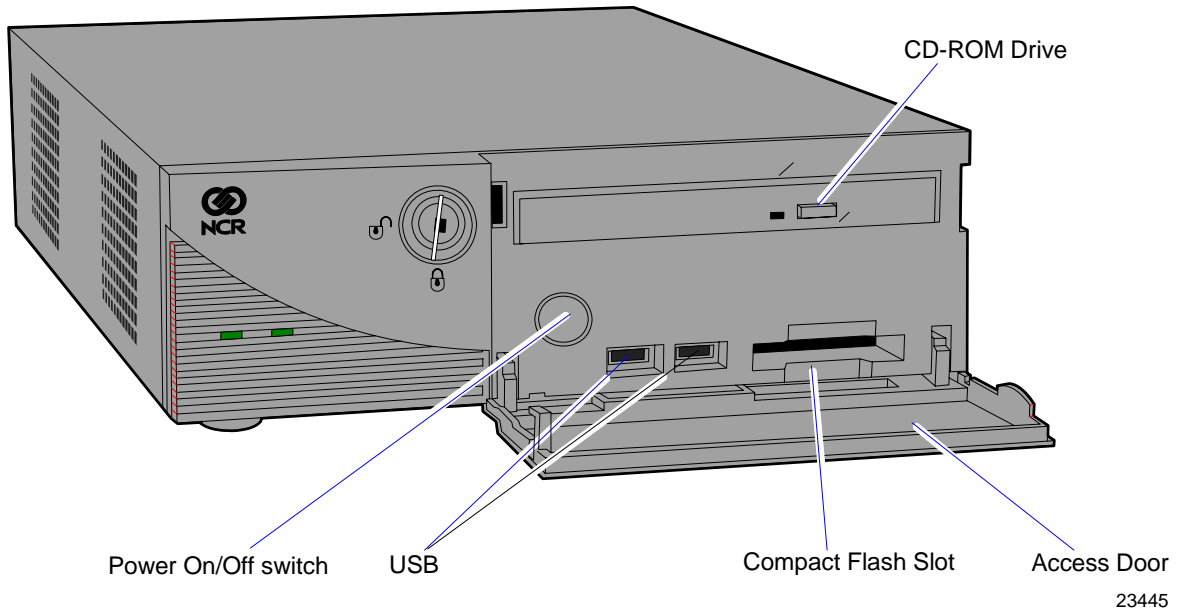
Operator Controls



7446-2110

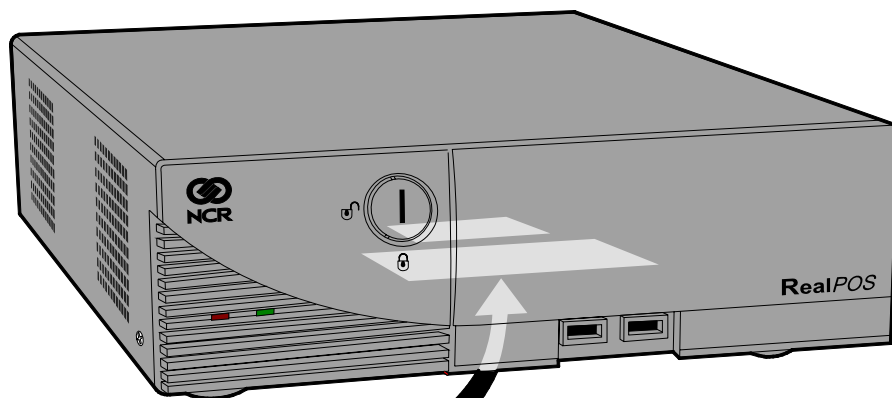


7446-3030/3131

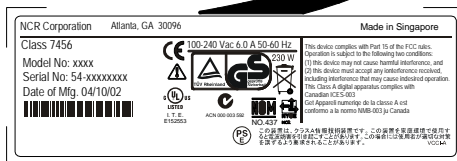


Serial Number/Model Number Label

The serial number and model number are included on a label, which is located at the bottom of the unit. A Certificate of Authenticity label is also included if the terminal was shipped with a pre-installed Operating System.



Note: Place Label On Bottom Of Unit



21582

Note: Another serial number label also appears inside the media door (door on front bezel protecting access to the Flex Disk Drive and power switch).

Features

7446-2110 Processor Board

The processor board has the following features:

- 1.2 GHz Intel Celeron processor with 100 MHz front side bus
- Two 168-Pin DIMM memory sockets with up to 1 GB of PC133 SDRAM
- One Combo PCI Riser Slot for Optional Expansion Card
- Two External RS-232 ports
- Four UHCI USB 1.1 Ports (two on Back Panel, two on Front Panel)
- Ethernet 10/100baseT LAN
- One Compact Flash Type I Socket on Secondary IDE Channel (Front Panel)
- One 40-pin Primary IDE Connector (Ultra ATA 33/66/100 Bus Master)
- One 44-pin Secondary IDE Connector (Ultra ATA 33 Bus Master)
- One 34/26-pin FDD Connector for Standard/Slim type FDD
- One 40-pin Connector for POS IO Board which has COM3/4, cash drawer kick out, and 24 V printer power ports
- 15-pin D-shell connector for CRT or analog LCD
- 25-pin D-shell Parallel connector
- 1.44 MB Flex Disk interface
- Audio out
- PS/2 Keyboard Port
- PS/2 Mouse Port
- Integrated Graphics controller Multiplexed with AGP Controller
- Two Fan connectors for CPU/System with FAN Control

7446-3030/3031 Processor Board

The processor board has the following features:

- 2.0 GHz Intel Celeron processor with 400 MHz front side bus
- Two 184-Pin DIMM memory sockets with up to 2 GB of DR266 SDRAM
- One Combo PCI Riser Slot for Optional Expansion Card
- Three External RS-232 ports
- Four UHCI USB 2.0 Ports (two on Back Panel, two on Front Panel)
- Ethernet 10/100baseT LAN
- One Compact Flash Type I Socket on Secondary IDE Channel (Front Panel)
- One 40-pin Primary IDE Connector (Ultra ATA 33/66/100 Bus Master)
- One 44-pin Secondary IDE Connector (Ultra ATA 33 Bus Master)
- One 40-pin Connector for POS IO Board which has COM3, Cash Drawer Kick Out, one 12 V Powered USB port, and one 24 V Powered USB port
- 15-pin D-shell connector for CRT or analog LCD
- 25-pin D-shell Parallel connector
- Audio out
- PS/2 Keyboard Port
- PS/2 Mouse Port
- Integrated Graphics controller Multiplexed with AGP Controller
- Two Fan connectors for CPU/System with FAN Control

Combo Riser Card

- One Combo PCI Riser slot for optional expansion
- 33 MHz, 5V, 32 bit
- Maximum length for PCI cards is 150mm (5.9 in.)
- PCI-2.2 compliant

Storage Media

- 3.5-Inch Flex Disk Drive (7446-1010/2110)
- CD-ROM Disk Drive (7446-3030/3031 option)
- 3.5-Inch Hard Disk Drive
- Compact Flash (through IDE interface)

I/O POS Board

7446-2110

The functions and capabilities include:

- Two D-Sub 9-pin for two 16550 compatible UARTs (COM3/COM4) with power selection jumpers
- One RJ11 Cash drawer port
- One +24V Port for a POS Printer
- On board +12V to +24V DC/DC converter for cash drawer power selection
- 40-pin Connector for connection to the Main Board
- 4-pin power connector

7446-3030/3131

The functions and capabilities include:

- One D-Sub 9-pin for one 16550 compatible UARTs (COM3) with power selection jumper
- One RJ11 Cash drawer port
- One +12 V USB Port for a POS Peripheral
- One +24 V USB Port for a POS Printer
- On board +12V to +24V DC/DC converter for cash drawer power selection
- 40-pin Connector for connection to the Main Board
- 4-pin power connector

Power Supply

- 180W Output power
- Active Power Factor Correction (PFC) circuit
- Auto-ranging input features
- 100-127VAC or 200-240 VAC, 50-60Hz

Operating Systems

- DOS 6.22
- Windows XPe
- Windows XP Pro
- Windows Embedded for Point-of-Sale (WePOS)
- Novell Linux for Point-of-Sale (NLPOS 9)

Power Management

Power management is implemented on the 7446 using the ACPI 1.1 Specification 1.1. In order to accomplish this, the processor board is equipped with ACPI BIOS.

The BIOS supports the ACPI 1.1 specification. This permits the terminal to go to a low power state during some level of inactivity. With ACPI, the operating system has some control over the power management by going into *suspend*, *standby*, or *hibernate* (depending on the Operating System). The **S0**, **S1**, **S4**, and **S5** states are implemented. For the detail of the ACPI, refer to *ACPI Specification 2.0b*. Not all Entry and Exit points are available at all times. Availability is based on ACPI states.

Notes:

- When the LAN cable is connected a *WakeOnLan* notification is sent to the operating systems, causing the terminal to come out of a low power state such as hibernation under Windows 2000/Windows XP. This is similar to the *WakeOnLan* feature.
- *Wake on Alarm* is not supported from the "off" state. This is because the ACPI power management in the BIOS does not allow the *Timer/Alarm* to wake the system. *Wake on LAN* is supported. Similar functionality can be implemented from the server by sending a LAN wakeup message.
- *Wake on Alarm* from Window NT is not supported.
- USB devices must be enabled in Windows 2000/Windows XP for *Wake from Standby* to function. This is set in at:
Start → Control Panel → System → Hardware Tab → Device Manager → [USB device] → Properties.
There is a check box to enable the function under the USB tab.

Definitions of the states involved

Mechanical Off: System is not working. No AC power is connected to the system. Operational parameters are not saved. System resets and initializes when transitioning to the Full On State.

Entry: a) Remove power from unit.

Exit: Connect power to unit. (move to *Soft Off* or *Full On* or *APM Enabled*)

Soft Off: AC Power is connected to the system. Only the 5V standby and 3.3V standby voltages are present within the machine.

Entry: a) Connect power to unit. (Assuming “Status after power fail” in BIOS Setup is configured for “Off” after power cycle or it is configured for “Previous Status” and the previous status was off when AC power was removed.

b) Turn off unit via power button. Power button can be configured for either instant off or for off after being pressed for longer than four seconds.

c) Unit turned off via software control

Exit: a) Press power button

b) Wake On LAN (*)

c) Wake ON Ring (*)

d) Wake On Alarm (*)

e) Remove AC

Note: Function has no effect with any of the following conditions:

a) First time AC is connected

b) Power button delay is set to 4 seconds into Soft Off state

c) BIOS is not set to enable these functions

Full On: System is working and not power managed (APM Disabled)

Entry: a) Press power button.

- b) Wake On LAN
- c) Wake On Ring
- d) Wake On Alarm

Exit: a) Turn off unit via power button. Power button can be configured for either instant off or for off after being pressed for longer than four seconds.

- b) Unit turned off via software control
- c) Remove AC

APM Enabled: System is working and not power managed

Entry: a) Press power button

- b) Wake On LAN
- c) Wake On Ring
- d) Wake On Alarm
- e) Wake on PS/2 keyboard or PS/2 mouse activity
- f) Wake on USB activity

Exit: a) Turn off unit via power button. Power button can be configured for either instant off or for off after being pressed for longer than four seconds.

- b) Unit turned off via software control
- c) Disable APM
- c) Remove AC

APM Standby

- System is in a low power state with some power savings
- Most devices are in a low power mode.
- The CPU clock is slowed or stopped.
- Operational parameters are retained.
- System returns quickly to the APM Enabled State.
- The Resume Timer event must return the system to the APM Enabled state.
- User activity may be required to return the system to the APM Enabled State.
- The operating system is notified after the system transitions to the APM Enabled State.
- Prior operation resumes after returning to the APM Enabled state.
- Interrupts must still be processed normally. This may require waking up the CPU temporarily if it was stopped.
- The CPU may be stopped again when the APM Driver calls the CPU Idle function.

Some (not all) specific device states:

- Hard Drive: Standby (motor not spinning, interface buffer active)
- Display: CRT – Suspend (No image on screen, LCD – Off)
- Video Controller: Standby
- Chipset: Standby

Entry: a) Programmable timeout

b) Under software control

Exit: a) Wake On LAN

c) Wake ON Ring

d) Wake On Alarm

e) Wake on PS/2 keyboard or PS/2 mouse activity

f) Wake on USB activity

g) Remove AC

APM Suspend: System is in a low power state with maximum power savings. Most power managed devices are not powered. The CPU clock is stopped. The CPU core is in its minimum powered state. Operational parameters are saved to be restored later when resuming. System takes a relatively long time to return to the APM Enabled state. The Resume Timer event must be on of the wakeup events. The operating system is notified after the system transitions to the APM Enabled state. Prior operation resumes after returning the APM Enabled state.

Some (not all) specific device states:

- Hard Drive: Sleep (motor not spinning, interface buffer inactive)
- Display: CRT – Off, LCD – Off
- Video Controller: Suspend
- Chipset: Suspend

Entry: a) Programmable timeout

b) Under software control

Exit: a) Wake On LAN

b) Wake On Ring

c) Wake On Alarm

d) Wake on keyboard, mouse, or touch activity

e) Wake on USB activity

f) Remove AC

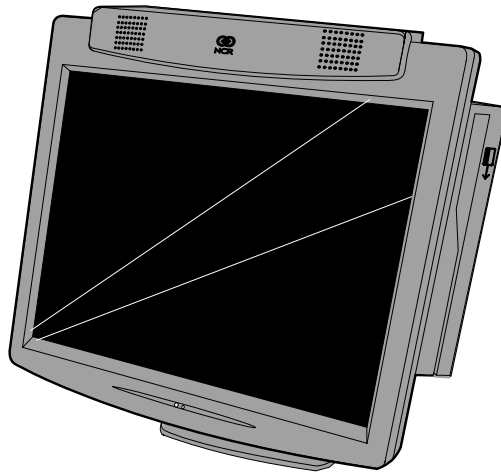
The APM BIOS provides some degree of power management functionality without any support from the operating system or application software.

An APM driver is better suited to make power management decisions for unique peripherals than the BIOS, and can override most BIOS requests to go into standby, suspend, and so on. APM device drivers provided by NCR with the RealPOS 30 are outlined in the Retail TAPS Programming Help File (BD90-0261-B).

Terminal power on/power off is controlled through a logic level power switch on the processor board. It can be disabled through software.

Operator Displays

5964 15-Inch Touch Screen



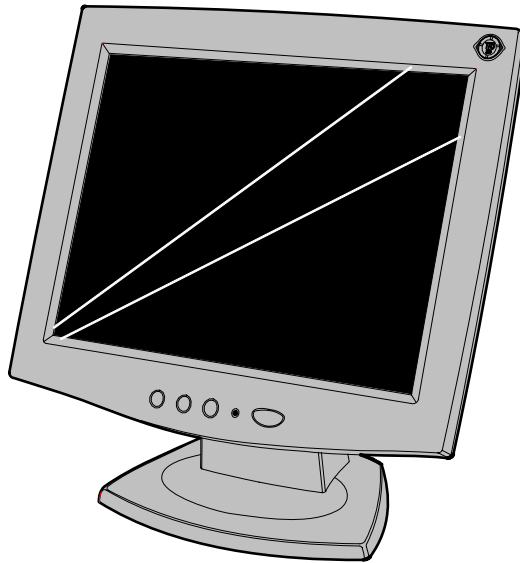
22041

The NCR 5964-8xxx is a 15-inch XGA (1024x768) Liquid Crystal Display with either a resistive or capacitive Touch Screen for operator input.

Features

- 15" LCD XGA (1024x768) native resolution, 350 nit typical brightness (also supports VGA, SVGA, SXGA)
- Dual Bulb, adjustable brightness
- Capacitive or 5-wire resistive touch options, USB interface.
- Video - VGA, standard 15 pin female.
- Integrated stereo speakers-volume controlled via the OSD.
- One standard USB port in addition to the powered USB port.
- Optional MSR- field installable, USB interface.
- Energy Star, ACPI and VESA DPM compliance
- Choice of integrated or remote mounts

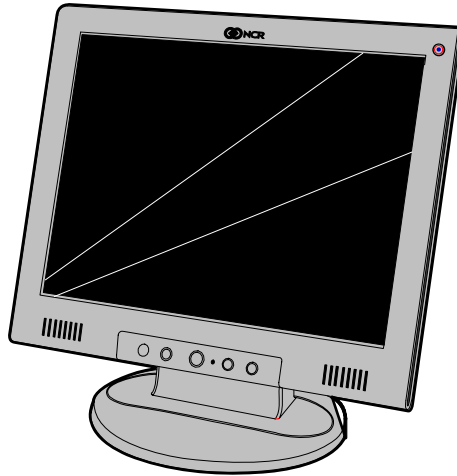
5942 12.1-Inch Color LCD



19809

The 5942 12.1-Inch LCD is designed for customers who desire a color display and prefer the small footprint and ergonomic packaging of LCD technology versus traditional CRT's. Depending on the customer's requirements, this LCD display can be used either as an operator display or a customer information display (CID). The 5942 Display features a 12.1-Inch Active Matrix Color LCD with support for SVGA and XGA resolution.

5942 15-Inch Color LCD

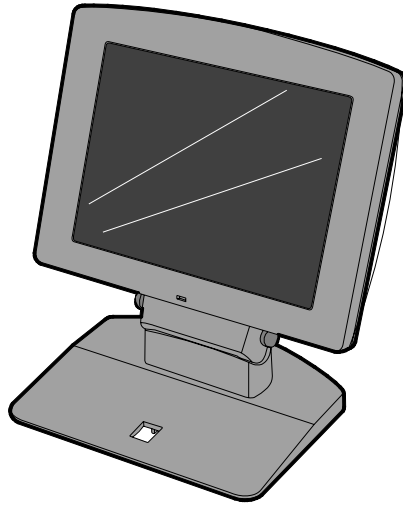


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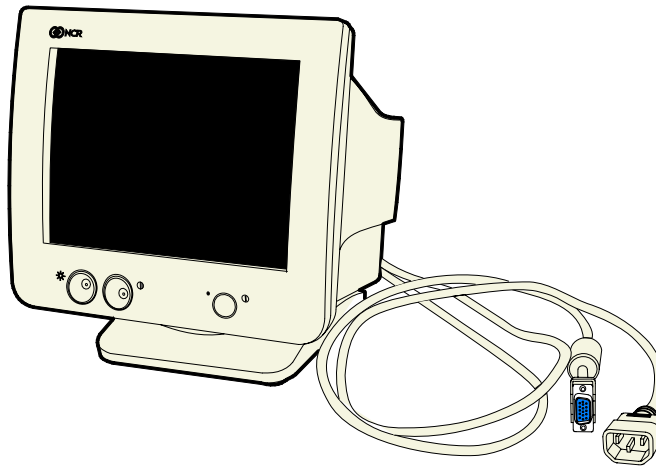
The 5942 15-Inch LCD features a high brightness dual-backlight active matrix LCD with analog interface which plugs directly into the standard VGA (CRT) port on the RealPOS 80c terminal. It includes a 1.5 meter VGA cable and built-in power supply with standard IEC connector. Mount and power cable must be ordered separately.

NCR 5982 6.5-Inch LCD Display

The 5982 LCD Display is a terminal-powered monochrome 6.5-Inch VGA LCD.



5960-1001 9-Inch Monochrome CRT



21903

Note: The display's data cable connects to the analog VGA port at the back of the terminal. However, place a separate order for the power cord to connect the CRT directly to an external AC outlet. There is no AC convenience outlet at the back of the RealPOS 30 terminal.

Features

- Non-glare, phosphor screen with SVGA (600x800) resolution
- Table top mount with tilt and swivel
- 4m Data (Video) Extension Cable
- 3m Power Cables

Keyboards

5932 Keyboards

The NCR 5932 Keyboards are intended for harsh retail environments and contain an internal membrane to protect against objects such as paper clips, staple wires, pins, and so forth, from falling between the keys and damaging the electronics. This technology improves overall reliability not typically found in standard PC keyboards or many retail keyboards.

The RealPOS 30 supports four models of the NCR 5932 Keyboard:

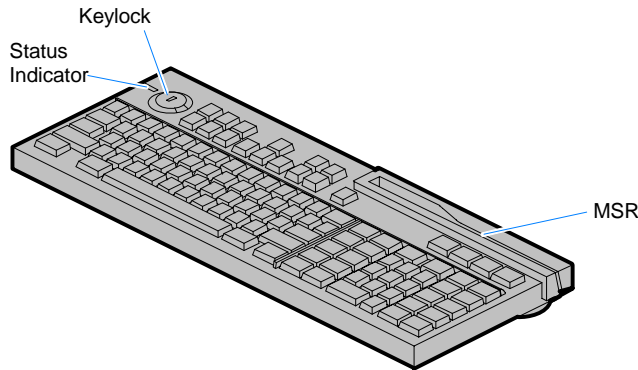
- NCR PS/2 Alphanumeric Big Ticket POS Keyboard (5932-1xxx)
- NCR 64-Key PS/2 POS Keyboard (5932-2xxx)
- NCR USB Alphanumeric Big Ticket Keyboard (5932-5xxx)
- NCR 5932-6xxx 104-Key Programmable POS Keyboard
- NCR 78-Key Programmable POS PS/2 Keyboard (5932-7xxx)

Keyboard Power

The RealPOS 80 supplies power to the PS/2 keyboard even when in the OFF state. This is for configurations that require the terminal to turn on when a key is pressed. Most NCR PS/2 keyboards have a Power ON LED which stays illuminated, indicating power is present in the keyboard. Pressing a key may also cause tones to be sounded, but unless the terminal is configured to power up when a key is press, nothing happens.

NCR PS/2 Alphanumeric Big Ticket POS Keyboard (5932-1xxx)

This *NCR PS/2 Alphanumeric Big Ticket POS Keyboard* contains a full alphanumeric keyboard, a POS numeric keypad, and POS Function keys. The function keys permit customer specific key assignments. It also includes a 68-Inch keyboard cable.



19745a

Features

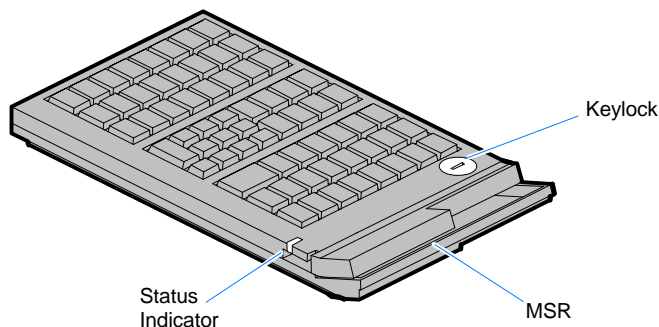
- 3-Track ISO Magnetic Stripe Reader (MSR)
- 68-Inch PS/2 Keyboard Cable
- International English Character Set

Wedge support for the following:

- Keylock
- Speaker
- Scanner
- MSR

NCR 64-Key PS/2 POS Keyboard (5932-2xxx)

The *NCR 64-Key POS Keyboard*, designed for checkout environments where alpha entry is not required, includes 55 assignable function keys and a numeric keypad with 11 keys.



19746

Features

- Keylock
- Speaker
- Scanner
- System Status Indicator LED
- 68-Inch PS/2 Keyboard Cable

Note: Configure a NCR 5932-2xxx if you need an MSR feature.

The Wedge controller handles the operations of the user-programmable speaker, Magnetic Stripe Reader (MSR), keylock, and scanner connector. Please refer to the *Wedge Software User's Guide* (BD20-1368-A) for detailed information about interfacing and configuring these devices.

Keylock

The Big Ticket and 64-key keyboards have a four-position keylock switch. The table following explains the keylock positions.

Abbreviation	Position	Description
Ex	Exception	Used by the customer or service representative to perform low-level programming such as terminal diagnostics, configuring the terminal, or loading the terminal.
L	Locked	Used to lock keyboard input to prohibit use of normal functions.
R	Register	Used when performing normal retail mode functions.
S	Supervisor	Used by supervisor to provide highest level of terminal control in cases such as refunds and running totals.

Speaker

A programmable speaker generates key clicks and error tones.

Buzzer

The buzzer is an internal on board Buzzer.

System Status Indicator LED

The system status indicator is a two-color LED. The green color indicates the keyboard has power. Red indicates an error condition. When the system is off, the LED does not light up.

When the 64-key keyboard is in the special *PC setup* mode, the LED flashes red/green.

The status and condition indicated by the LED are as follows:

Status	Condition
Green	Power on
Red	Wedge controller reporting an error condition
Flashing red/green	Keypad of 64-key keyboard in <i>PC Setup</i> mode
Off	System off (see <i>Keyboard Power</i> section)

Note: For more information about the Wedge controller, refer to *Wedge Software User's Guide* (BST0-1368-B).

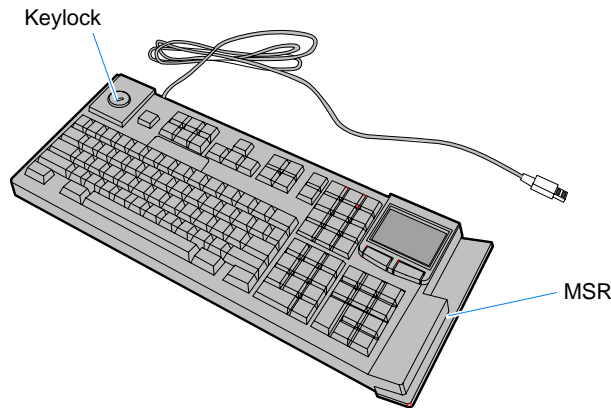
MSR (Magnetic Stripe Reader)

The MSR is an optional feature that provides support for reading magnetically coded data cards. The keyboards support two different types of MSR:

- ISO Tracks 1, 2, and 3
- JIS-II and ISO Track 2 (Big Ticket and full-featured 64-key keyboards only)

Note: MSR signals are routed to the Wedge controller and passed into the system keyboard data stream. For more information about the Wedge controller, refer to *Wedge Software User's Guide* (BD20-1368-A)

NCR 5932-5xxx USB Alphanumeric Big Ticket Keyboard



19586

The *NCR USB Alphanumeric Big Ticket Keyboard* is a multifunction keyboard that is two keyboards built into one.

The keyboard consists of two major sections:

- 38-key POS keyboard
- Industry-standard alphanumeric PC keyboard

The keyboard contains the key matrix and other POS-specific functions such as keylock, speaker, system status indicator, and magnetic stripe reader (MSR). This 5932 keyboard also has a USB port to connect a Scanner or other USB device.

Features

The NCR 5932 USB Keyboard supports the following features:

- Integrated Touch Pad, Keylock, Speaker, 3-Track Magnetic Stripe Reader (MSR)
- Keyboard Status LEDs
- USB cable
- Additional external USB ports
- No language characteristics

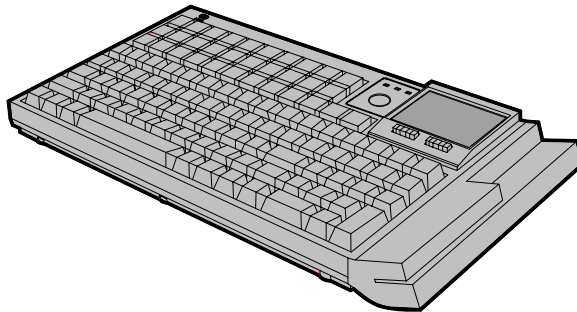
Note: Refer to *NCR 5932 USB Keyboard User's Guide* (B005-0000-1395) for further detailed information.

NCR 5932-6xxx 104-Key Programmable POS Keyboard

The *NCR 5932 104-Key Programmable POS Keyboard* is a PS/2 multifunctional keyboard that is two keyboards built into one.

The keyboard consists of two major sections:

- 32-key Point-Of-Sale Keyboard
- PC type Alphanumeric Keyboard



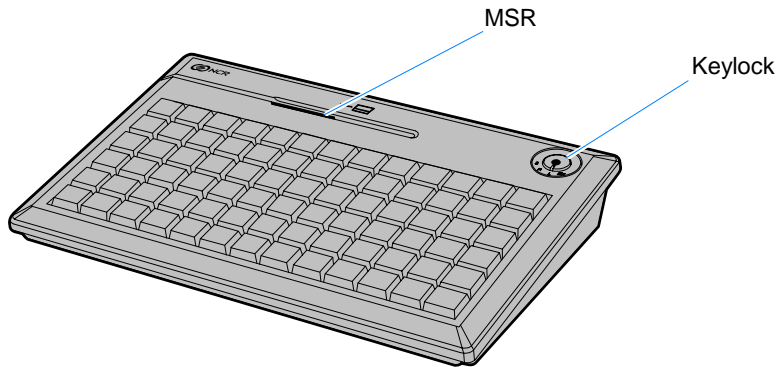
21662

The keyboard includes the following features:

- Keylock
- Tone Indicator
- Keyboard Status Indicator
- Magnetic Stripe Card Reader (MSR)
- Glide Pad

NCR 5932-7xxx PS/2 78-Key POS Keyboard

The *PS/2 78-Key POS Keyboard* is designed for checkout environments where alpha entry is not required. This keyboard is shipped with (55) re-legendable POS function keys and a numeric keypad with (11) keys. The keyboard interfaces to the RealPOS 30 via a PS/2 interface.



22048

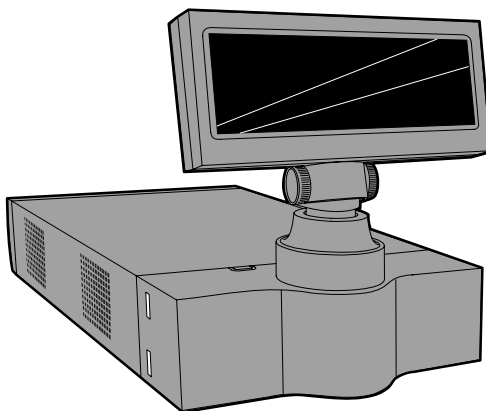
The keyboard includes the following features:

- Keylock
- Tone Indicator
- Magnetic Stripe Card Reader (MSR)
- Extended Keyboard Port

Customer Displays

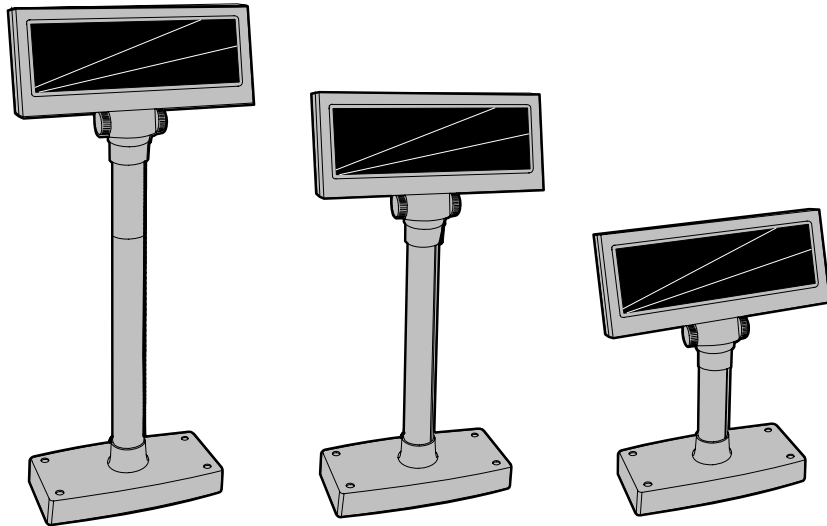
7446-K453 VFD

The 7446-K453 can be integrated on the RealPOS 30 when combined with the 7446-K301 Rear Cable Cover Kit.



21679a

Optionally, the 7446-K453 can be combined with the 7446-K454 Remote Base Kit to become a free-standing remote display. The remote base kit includes two posts, which provide a variety of height options ranging from 20 – 51 cm (7.8 – 20 in.).

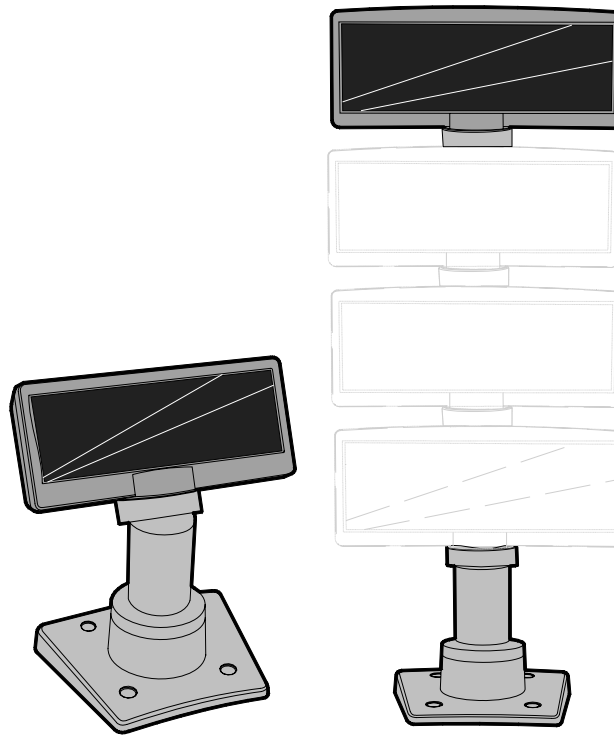


21677a

Features

- 5 x 7 pixel characters
 - international (single-byte) characters sets
 - Euro
- OPOS drivers available for supported Windows O/S
- Adapter, mounts to rear base with 2 screws (only screws required)
- 11.5cm short extension post
- 25cm long extension post
- 50 cm RS-232 cable (integrated)
- Sturdy plastic base with 4 screw mounts for attaching base to countertop (Remote)
- 2m RS-232 cable (Remote)
- Terminal Powered

NCR 5975 2x20 VFD Customer Display



22933

The NCR 5975 Customer Display is designed to be an optional display device for the NCR retail terminals. It can also serve as a display for any industry-standard PC. It is a Vacuum Fluorescent Display (VFD).

- 5975-1000 2x20 VFD (G11)
- 5975-1001 2X20 VFD (CG1)

There are four post options, available in 4 inch increments.

Features

- Display
 - 2X20 Character Vacuum Fluorescent Display (VFD)
 - 7X9 pixel characters
 - Character height
 - Minimum - 9mm
 - Maximum - 11mm
- PCB
 - Microcontroller
 - EIA 232 Interface support
 - USB 2.0 Interface support
- Cabinet
 - UV Stable Material
 - Available in NCR Light Gray (G-11) and NCR Charcoal Gray (CG1)
- Connectors
 - 9 pin D sub
 - Powered USB
- Cables
 - Powered EIA-232
 - Powered USB Cable
 - Unpowered EIA-232 Cable with Y-Connection for Power Brick
 - Unpowered USB Cable with Y-Connection for Power Brick
 - 1m and 4m Lengths

- Power Supply
 - Universal Power Supply (12V, 12W output)
 - 8 pin Molex Connector
- EIA-232 or USB 2.0 I/F support
 - The components for both interfaces are populated on a single printed circuit board. Both interfaces are active, though only one interface can be physically connected at a time. The display communicates via the interface connected to it.
- Mounting Options
 - Table Mount, 4-in. Post
 - Table Mount, 8-in. Post
 - Table Mount, 12-in. Post
 - Table Mount, 16-in. Post
 - Integrated Mount for NCR 7456, 7457, 7458

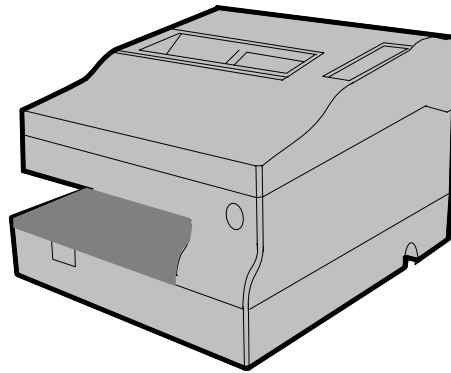
Character Sets

- Support for 19 character sets
- 3 Character sets in base unit
 - Code Page 858 (International)
 - Katakana
 - Code Page 866 (Cyrillic)
- 32 KB Flash Memory for support of up to 16 additional character sets

Printers

7162 Printer

The NCR 7162 is a dot matrix printer that provides up to 40 columns receipt and journal, and up to 88 columns of slip print. The printer's features include paper low sensors, slip-out detectors, automatic paper cutting, and two cash drawer kick out connectors. It has an RS-232 data interface. It receives power from the 24V connector on the terminal I/O Board or from an external power supply.. It also has a connector for cash drawers.

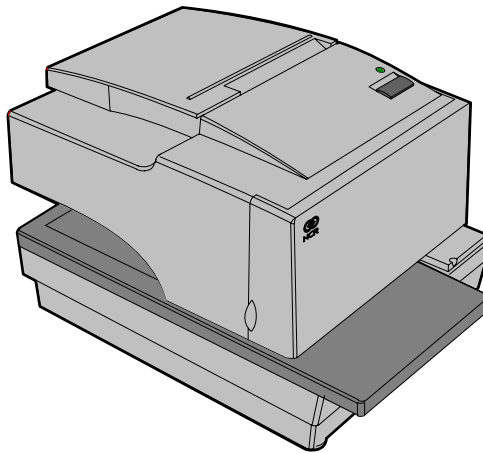


15220c

Note: Printer data cable is not included with the printer.

7167 Printer

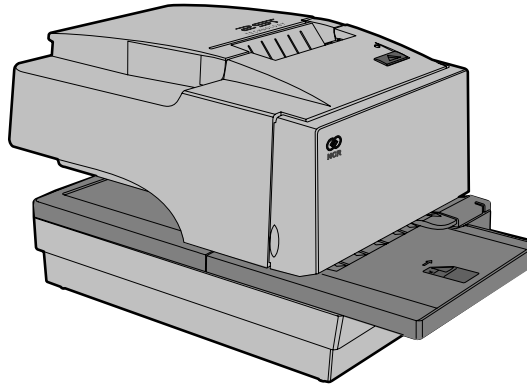
The NCR 7167 Printer is a fast, quiet, relatively small and very reliable multi-function printer. It prints receipts, validates and prints checks, and prints on a variety of single or multiple part forms. There is no journal as the host terminal keeps it electronically. The printer can connect through a USB port or a serial port. It receives power from the 24V connector on the terminal I/O Board or from an external power supply.



19711

Note: Printer data cable is not included with the printer.

7168 Printer



23446

The 7168 printer is a fast, quiet, relatively small and very reliable multiple-function printer with front and back printing on the receipt paper capability. It prints receipts, validates and prints checks, and prints on a variety of single- or multiple-part forms. There is no journal as it is kept electronically by the host computer.

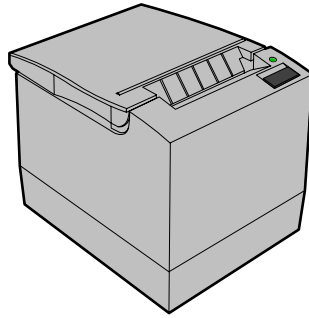
The industry-standard RS-232C communication interface allows the 7168 to be connected to any host computer that uses RS-232C or USB communication interface.

The receipt station uses thermal printing technology. Therefore, there is no ribbon cassette to change and paper loading is extremely simple. Printing on single- or multiple-part forms, validating checks, and printing checks is also easy in the accommodating slip station.

Another feature is the Magnetic Ink Character Recognition (MICR) check reader with parsing, which reads account numbers on checks for easy verification. An extended slip table is available for handling large forms and is standard with the MICR option.

7197 Printer

The NCR 7197 Printer is a fast, quiet, relatively small and very reliable multi-function printer. It prints receipts and is capable of two-color printing. The printer can connect through a USB port or a serial port. It receives power from the 24V connector on the terminal I/O Board or from an external power supply.

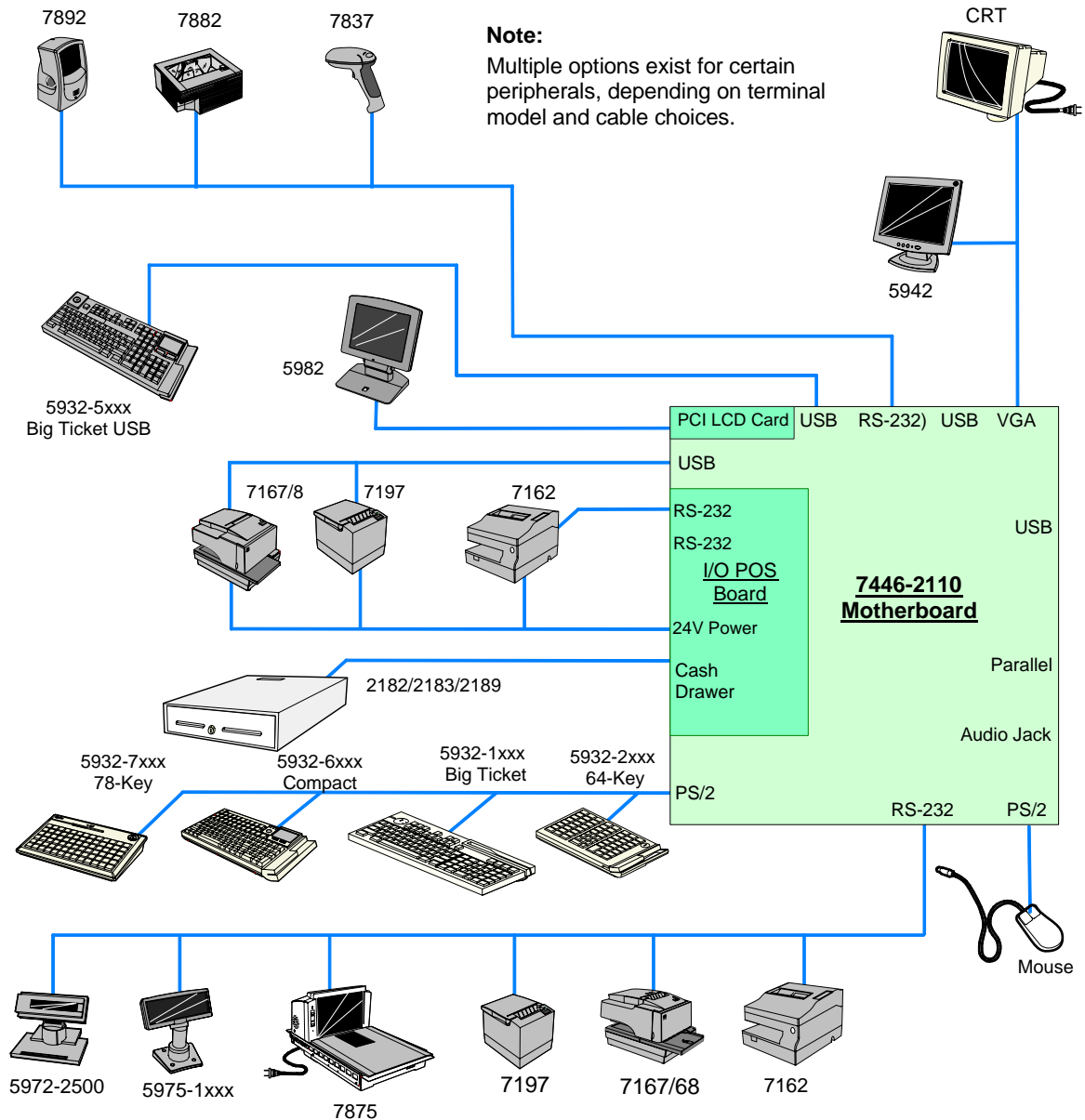


19712

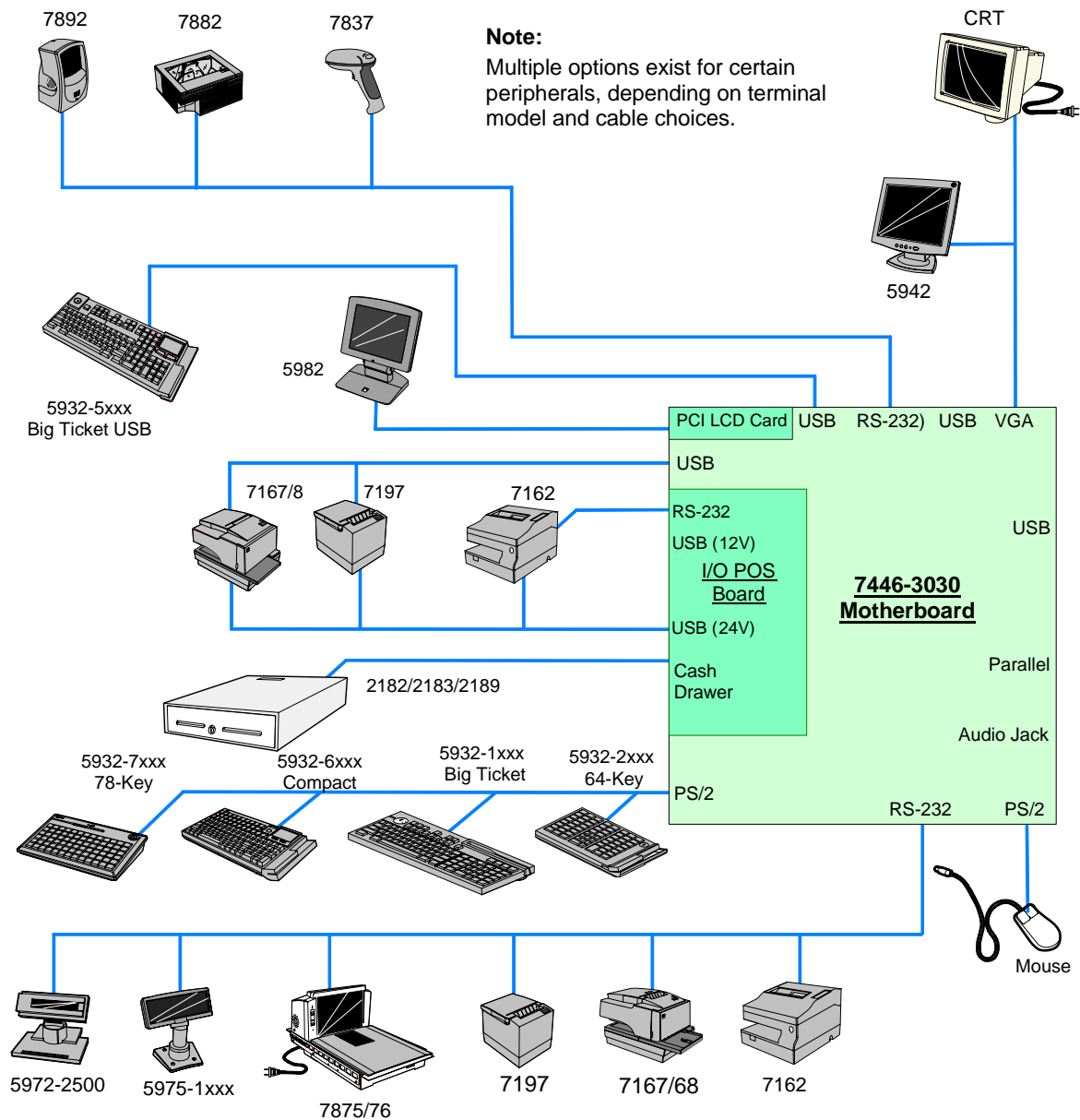
Note: Printer data cable is not included with the printer.

System Configuration Diagrams

7446-2110



7446-3030/3131



Chapter 2: Hardware Installation

This chapter explains how to install the RealPOS 30 hardware, including out-of-box installation and how to install the optional peripheral devices. The 7446 is very flexible to install. This document discusses a *typical* configuration. Your configuration may require adjustments to the procedures.

Installation Restrictions

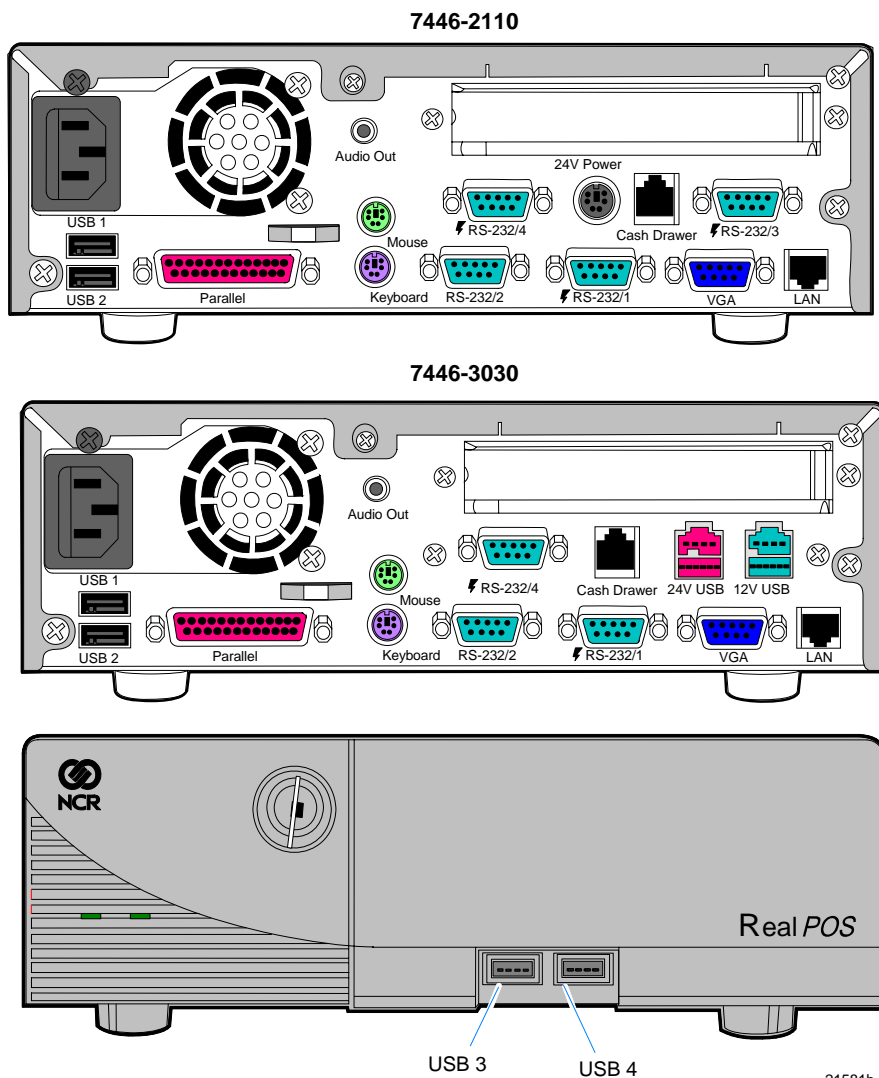
- Before installing the RealPOS 30, read and follow the guidelines in the *RealPOS 30 Site Preparation Guide* (B005-0000-1552) and the *NCR Workstation and Peripheral AC Wiring Guide* (BST0-2115-53).
- Install the RealPOS 30 near an electrical outlet that is easily accessible. Use the power cord as a power disconnect device.
- Do not permit any object to rest on the power cord. Do not locate the RealPOS 30 where the power cord can be walked on.
- Use a grounding strap or touch a grounded metal object to discharge any static electricity from your body before servicing the RealPOS 30.

Caution: This unit contains hazardous voltages and should only be serviced by qualified service personnel.

Caution: **Do not** connect or disconnect the transaction printer while the terminal is on. This can result in system or printer damage.

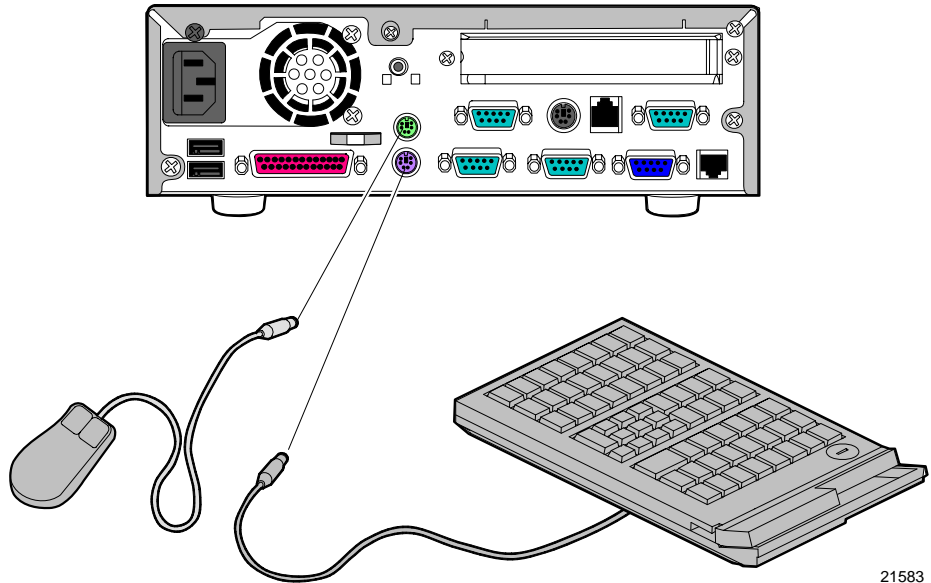
Base Terminal

1. Unpack the terminal in the desired location.
2. Connect the external cables. The following illustration identifies the Back Panel and Front Panel cable connectors (I/O POS Board is shown).



Keyboard and Mouse Connections

The keyboard and mouse directly connects to the terminal through the PS/2 connectors. A PS/2 connector is available for each.



Installing the Transaction Printer

The NCR 7162, NCR 7167 and NCR 7197 printers connects to the terminal directly or as remote devices. Other printers are available as remote devices only.

The printers can connect through a USB connector or an RS-232 connector.

Interfaces Supported

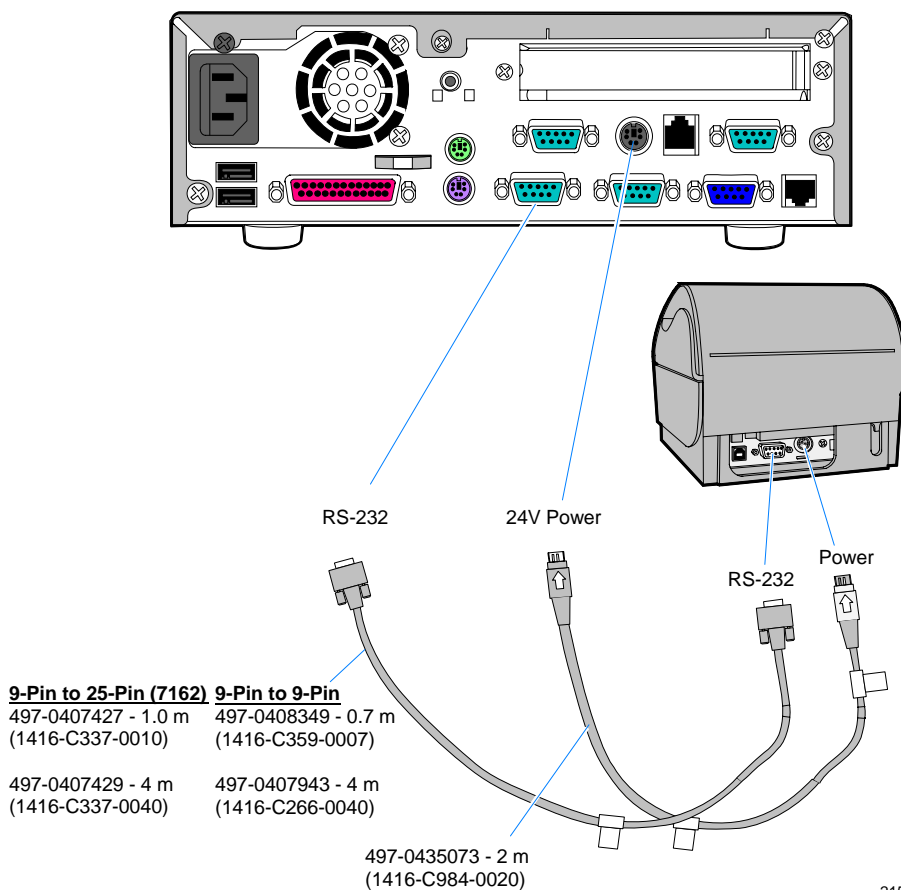
Printer	USB	RS-232
7162		√
7167	√	√
7168	√	√
7197	√	√

RS-232 Installation

There are two RS-232 configurations possible, depending on which terminal being used.

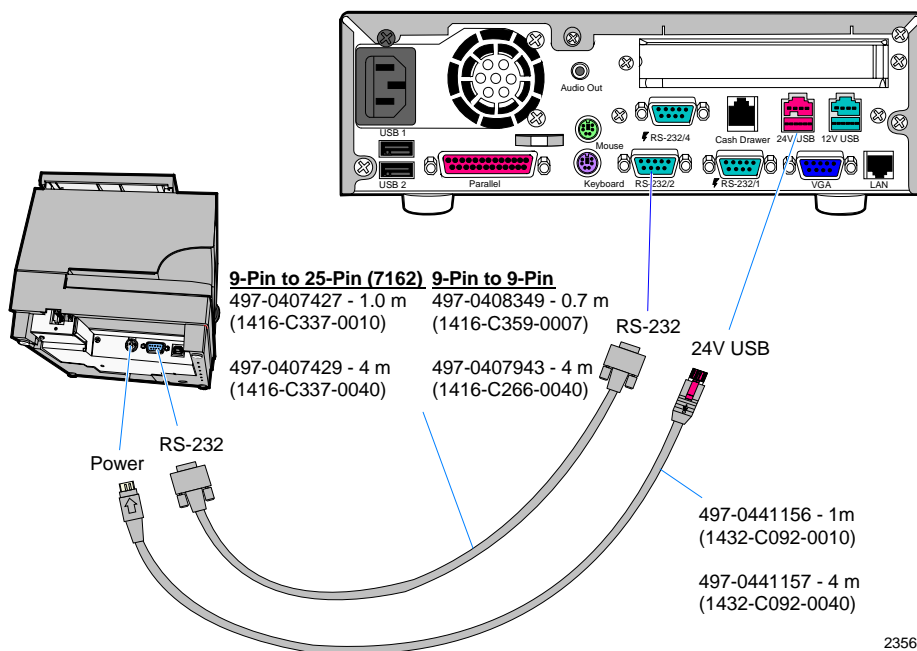
7446-2110

1. Connect the RS-232 Printer Interface Cable to the *RS-232* connector on the printer and to a non-powered *RS-232* connector on the terminal.
2. Connect the Printer Power Cable to the *Power* connector on the printer and to the *24V* connector on the terminal.



7446-3030

1. Connect the RS-232 Printer Interface Cable to the *RS-232* connector on the printer and to a non-powered *RS-232* connector on the terminal.
2. Connect the Powered USB Printer Interface Cable to the *USB Connector* and *Power Connector* on the printer and to the *24V Powered USB Connector* on the terminal.

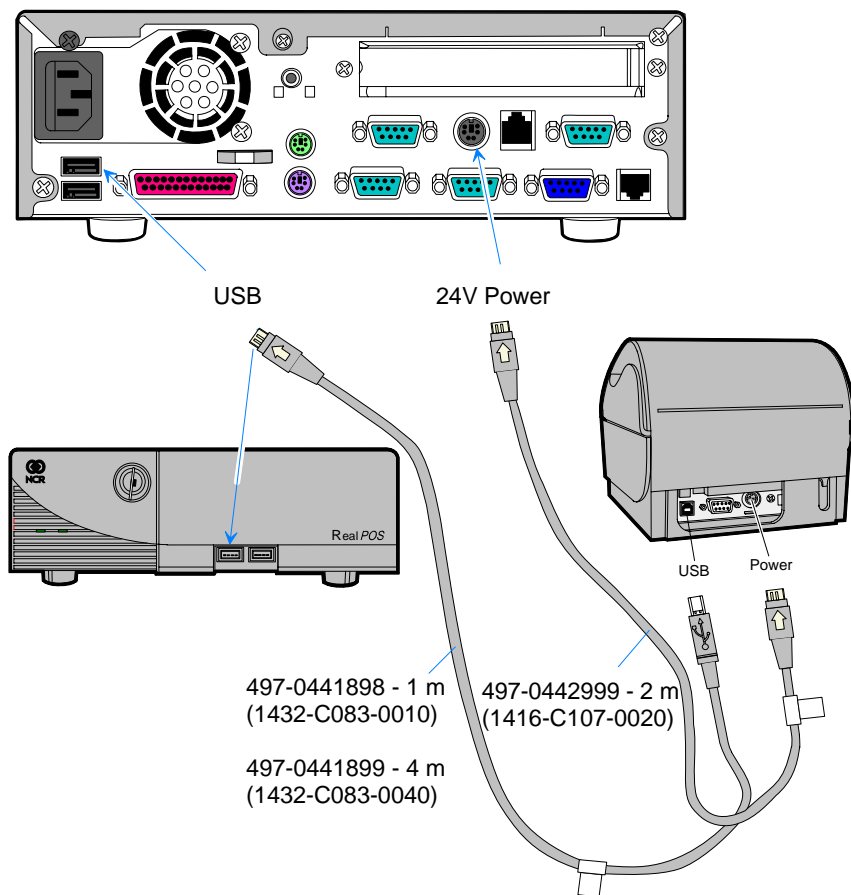


USB Installation

There are two USB configurations possible, depending on which terminal being used.

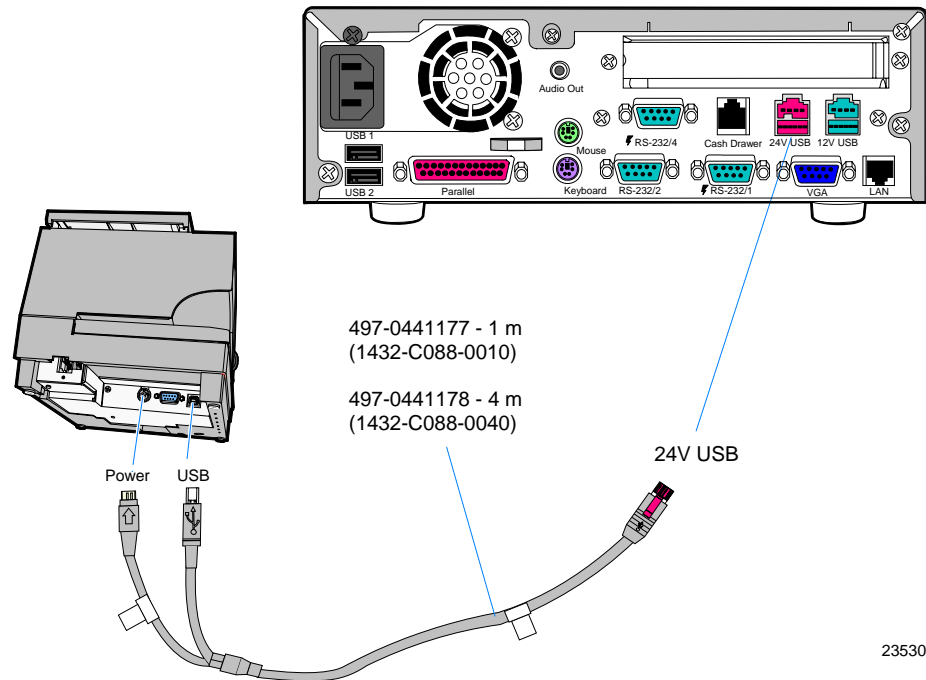
7446-2110

1. Connect the USB Data Connector Cable to the *USB* connector on the printer and to one of the *USB* connectors on the terminal.
2. Connect the Printer Power Cable to the *Power* connector on the printer and to the *24V Power* connector on the terminal.



7446-3030

Connect the Powered USB Printer Interface Cable to the *USB Connector* and *Power Connector* on the printer and to the *24 V Powered USB Connector* on the terminal.



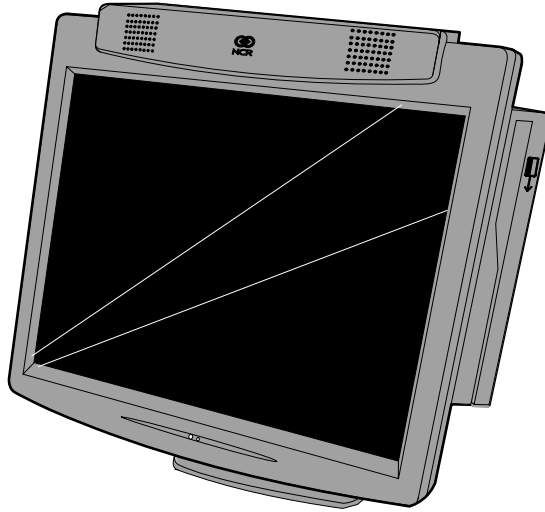
Installing the Operator Display

You may place an Operator Display directly on top of the base terminal. When there is no Customer Display the recommended location for the Operator Display is the back position, thus minimizing the overhang of the display.

The 7446 supports the following Operator Displays.

- NCR 5964 LCD Touch
- NCR 5942 LCD Monitor
- NCR 5982 6.5-Inch Mono LCD
- NCR 5960 9-Inch Monochrome CRT (Remote)

Installing a 5964 15-Inch LCD Touch Monitor



22041

Note: A PC keyboard is required to configure a 5964 15-inch Touch LCD.

7446-2110

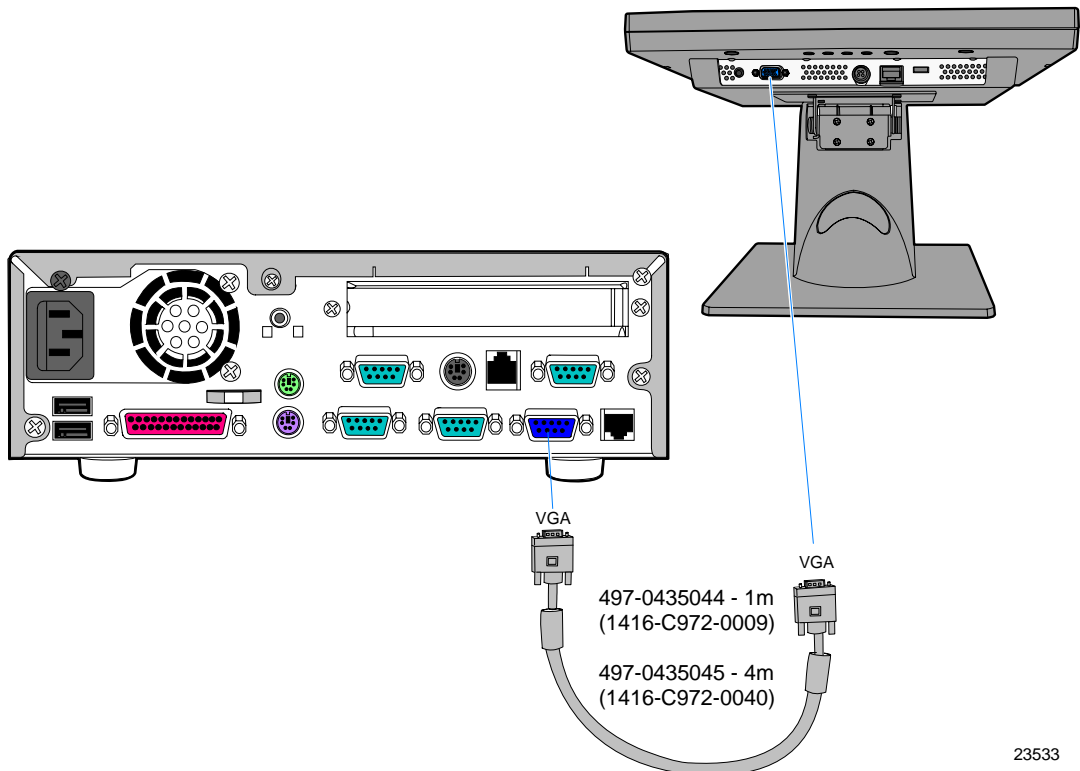
The following illustrations show the cable connections for the 5964 and the 7446-2110. There are two cables and a Power Supply required.

- VGA cable for video
- Universal Serial Bus (USB) for data
- Power Supply (Desktop Brick)

Note: The Power Supply does not include an AC Cord. It is ordered separately per country requirements.

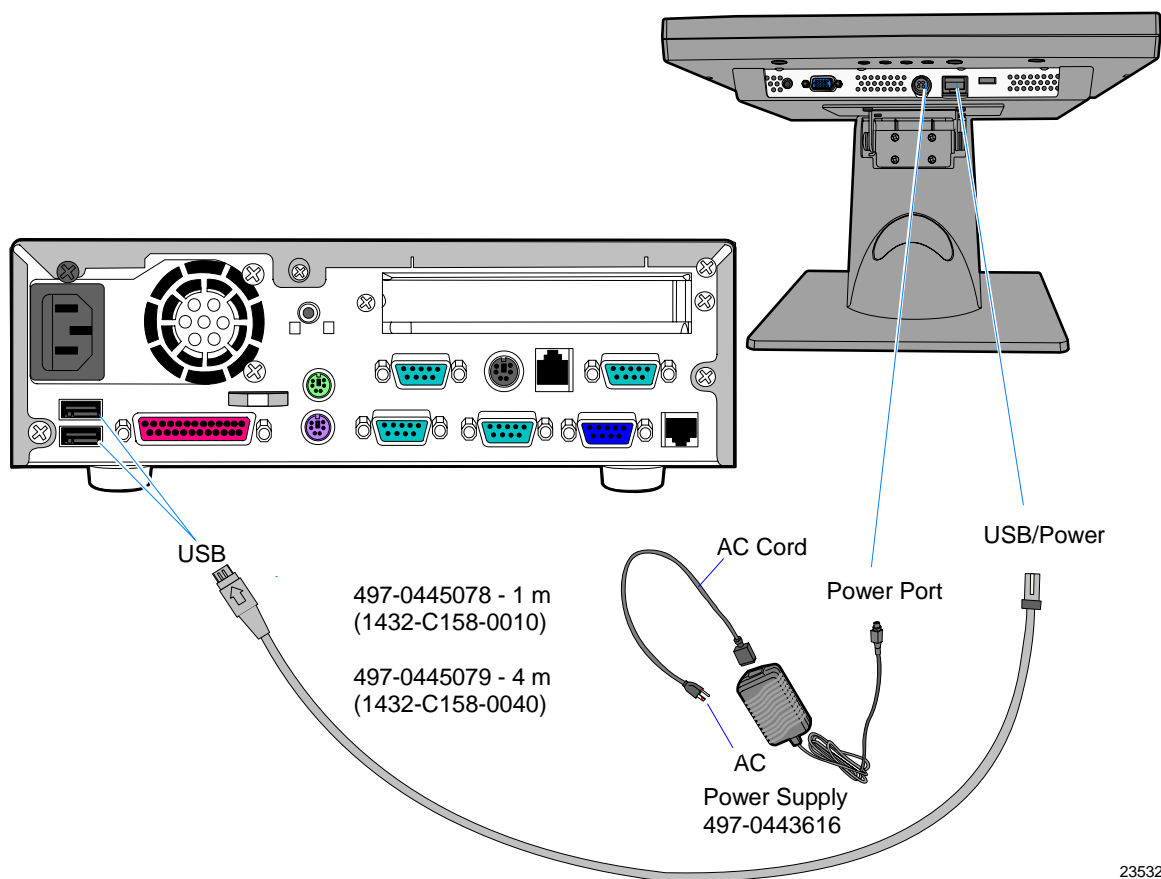
VGA Connections

1. Connect the VGA Cable to the VGA connectors on both the 5964 Touch Monitor and the RealPOS 30 terminal.



Non-Powered USB Cable Connections

2. Connect the Powered USB Cable to the 5964 and to one of the *USB* connectors on the RealPOS 30 terminal.
3. Connect the AC Power Supply to the DC Power port on the 5964.
4. Connect the AC Cord to the Power Supply.
5. Connect the power cable to an AC source.



23532

For more information refer to the *NCR 5964 15-Inch Touch LCD User's Guide* (B005-0000-1570)

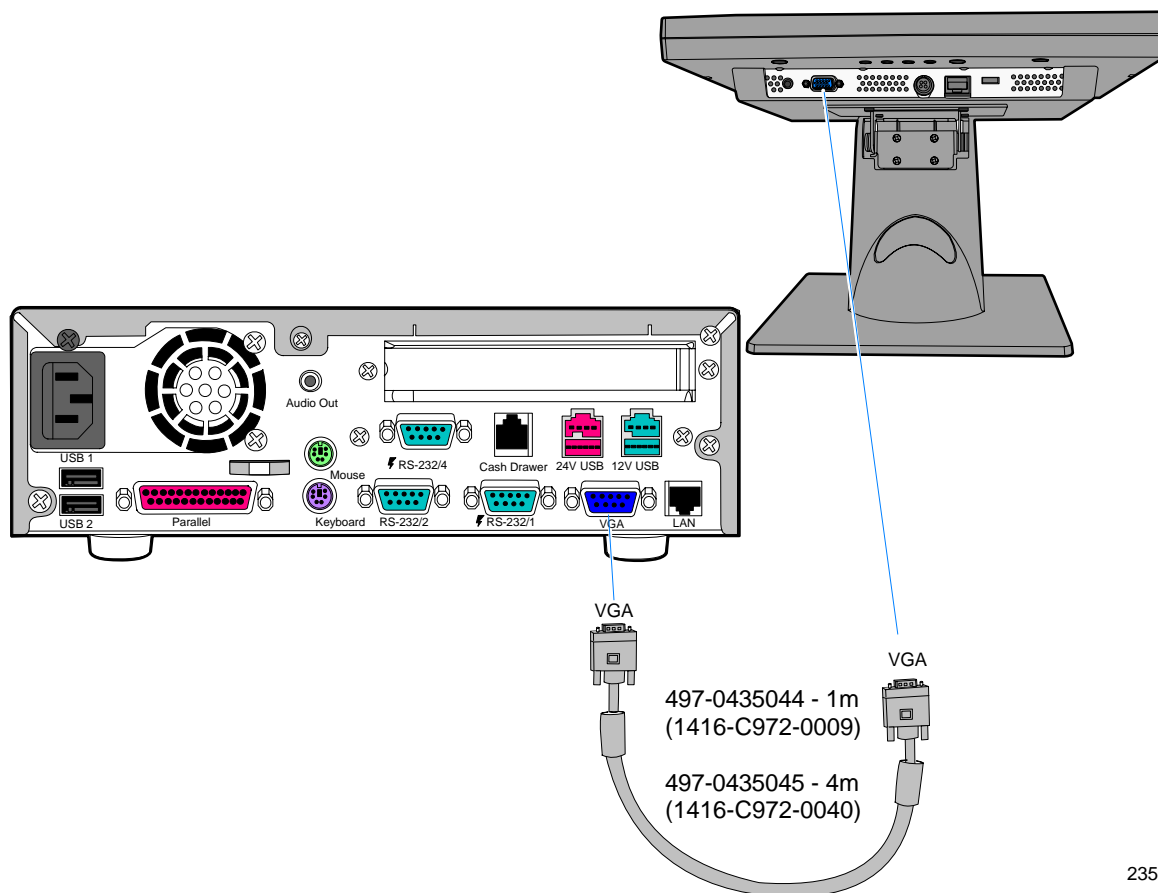
7446-3030/3131

The following illustrations show the cable connections for the 5964 and the 7446-3030. There are two cables required.

- VGA cable for video
- Powered Universal Serial Bus (USB) for data and power

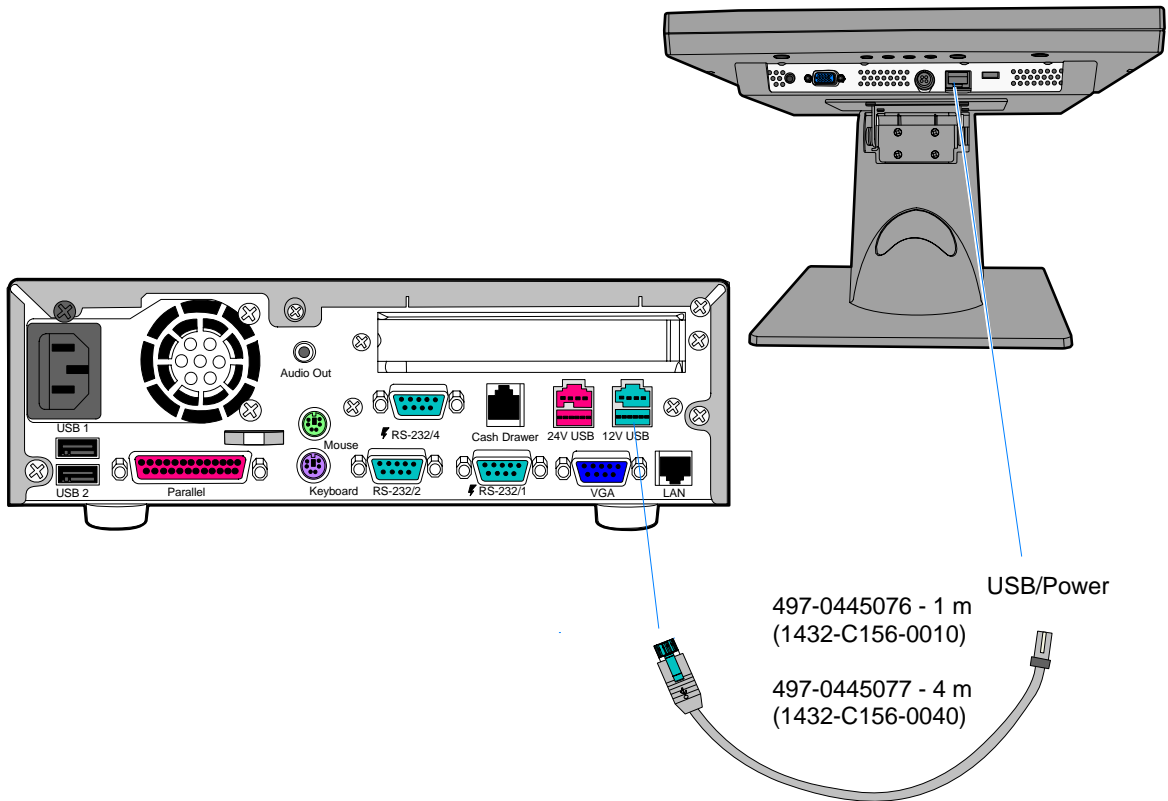
VGA Connections

1. Connect the VGA Cable to the VGA connectors on both the 5964 Touch Monitor and the RealPOS 30 terminal.



Powered USB Cable Connections

2. Connect the Powered USB Cable to the 5964 and to the *Powered 12V USB* connector on the terminal.

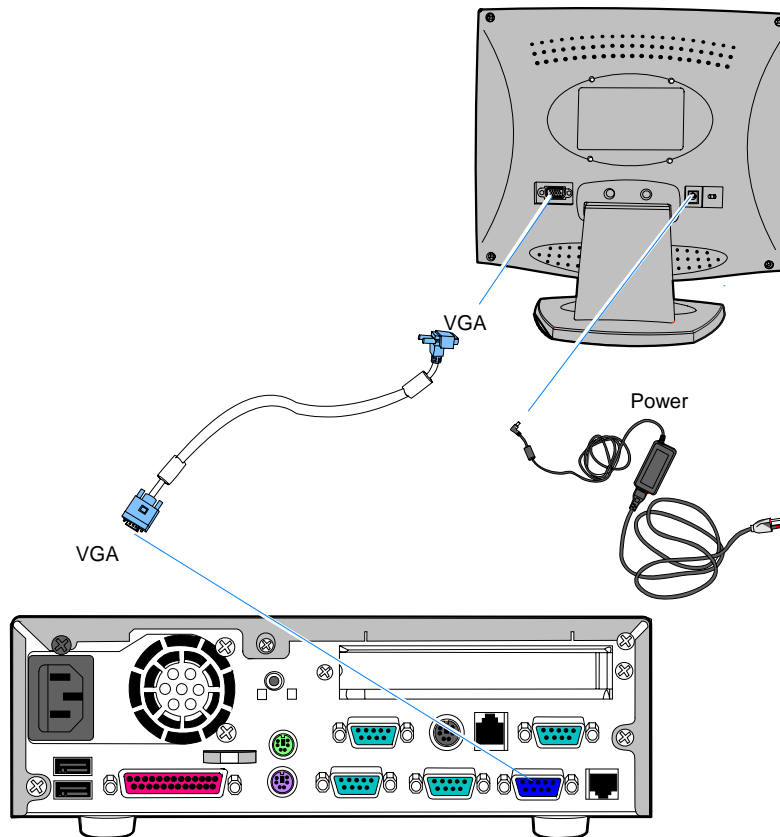


Installing a 5942 12-Inch or 15-Inch LCD Monitor

The 5942 LCD Monitors connect to the VGA connector on the terminal. Power is received from an external power supply.

Note: The 12-Inch model can be powered from the terminal using a powered USB cable (7446-3030 only).

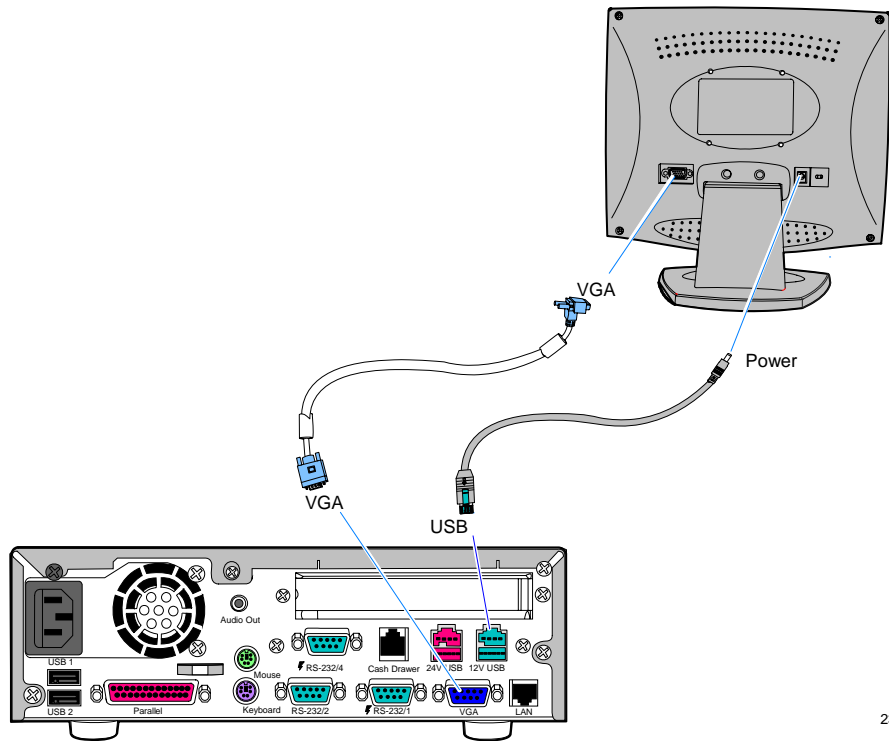
External Power Supply 12-Inch/14-Inch



21586

1. Connect the LCD Cable to the VGA connectors on the 5942 monitor and RealPOS 30 terminal.
2. Connect the power to the monitor by connecting the AC Power Supply to a standard AC outlet using an AC cable.

Terminal Powered 12-Inch (7446-3030/3131)

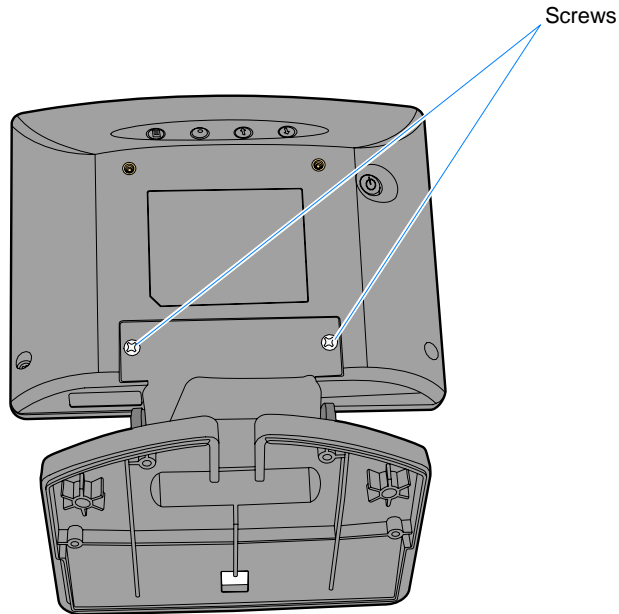


23534

1. Connect the Video Cable to the VGA connectors on the 5942 monitor and RealPOS 30 terminal.
2. Connect the Powered USB Cable to the 5964 and to the *Powered 12V USB* connector on the terminal.

Installing a Remote NCR 5982 6.5-Inch Operator Display

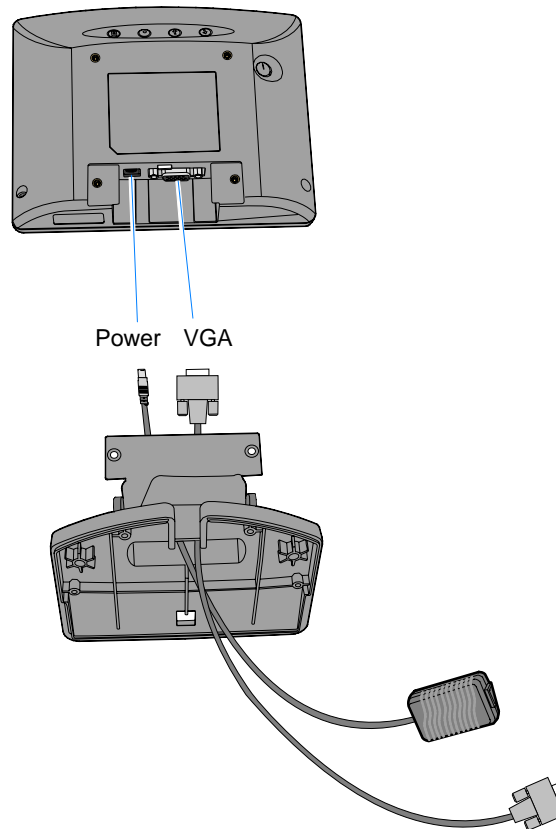
1. Remove the Base from the Display (2 screws).



23162

2. Route the VGA and Power cables up through the bottom of the Base and connect them to the Display.

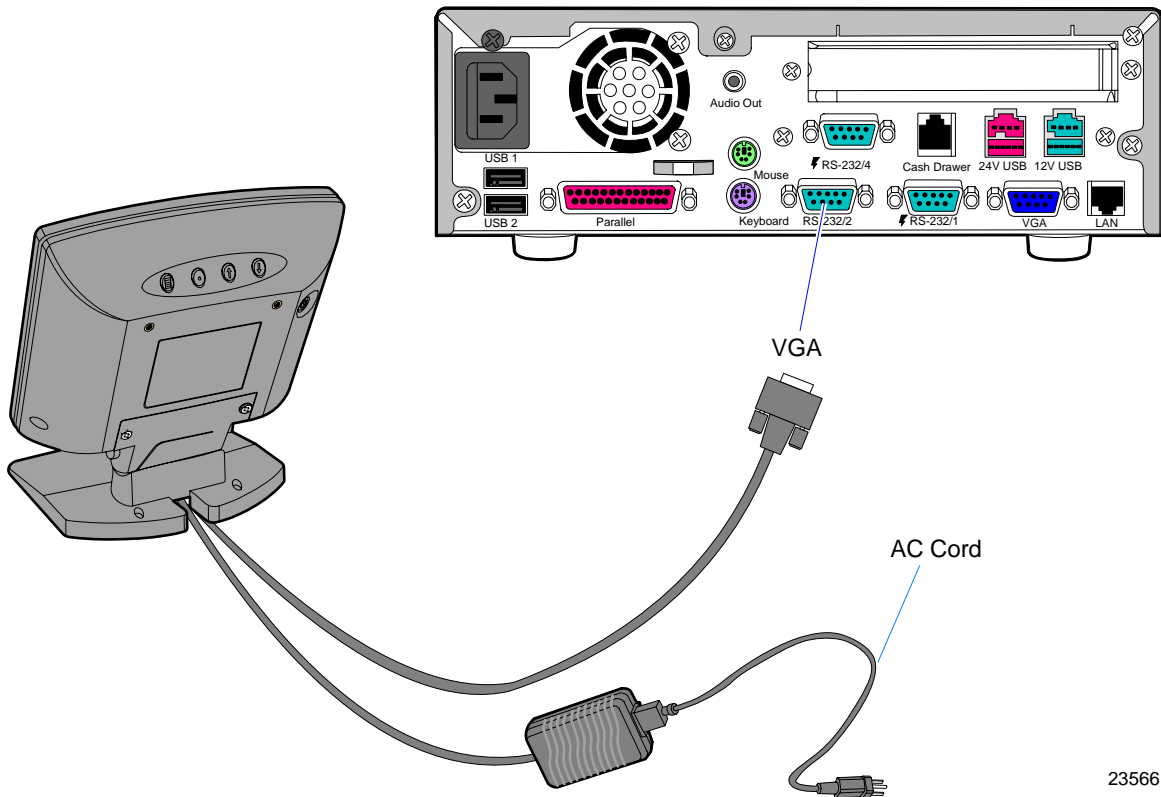
Note: The power cable can be either an External Power Supply or a Powered USB cable on the 7446-3030 model.



3. Install the Base to the Display (2 screws).
4. Route the cables out the rear of the Base.
5. Connect the Power Cable:

External Power Supply

- a. Connect the AC Cord to the Power Supply.

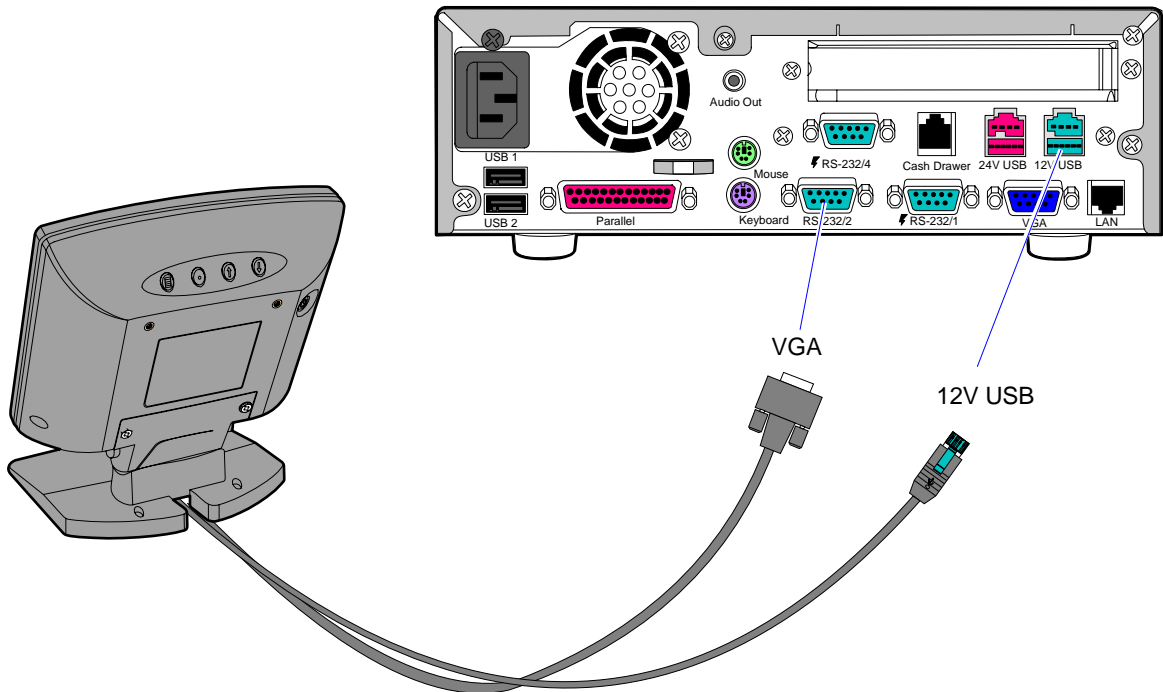


23566

- b. Connect the VGA cable to the VGA port on the host terminal.
- c. Connect the power cable to an AC source.

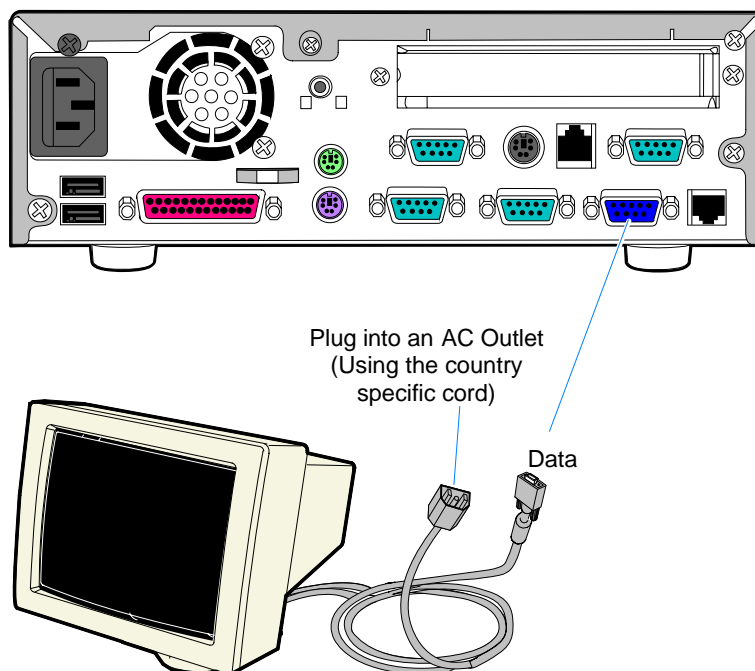
Terminal Powered (7446-30303131)

- a. Connect the Power Cable to the *Powered 12V USB* port on the host terminal.



CRT

1. Connect the CRT Data Cable to the VGA connector.
2. Connect the AC Power Cable to a standard AC outlet using an AC adapter cable (1416-C508-0040).



21590

Note: The RealPOS 30 does not offer an AC convenience outlet for CRT power. A separate country-specific power cord must be ordered separately.

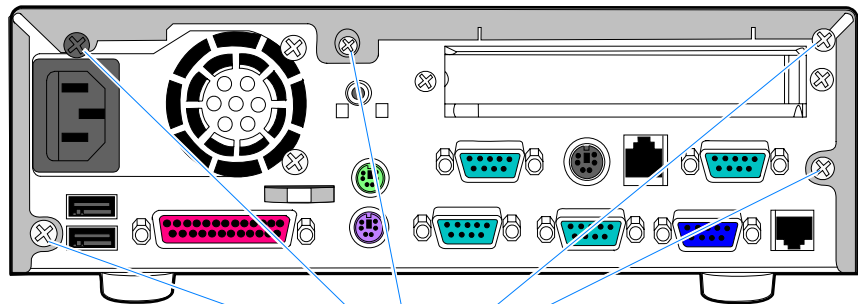
Installing an Integrated Customer Display

The Integrated Customer Display consists of two kits:

- NCR 7446-K453 Customer Display Kit
- NCR 7446-K301 Cable Cover Kit

1. Install the Cable Cover Kit.

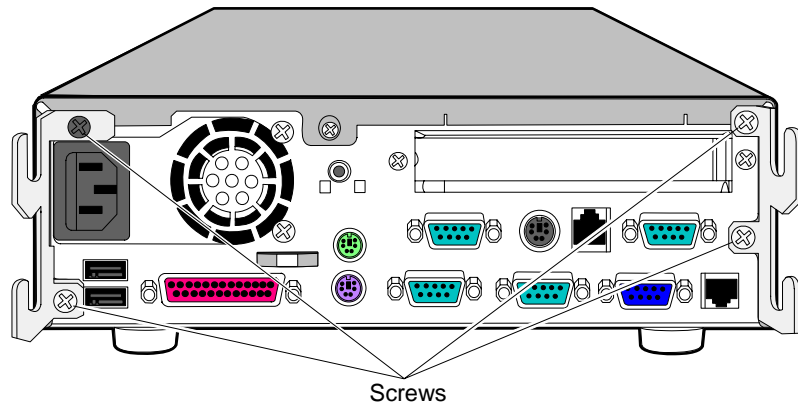
- a. Remove the screws (5) from the rear of the terminal. Discard the four silver screws and keep the black screw (upper left-hand corner).



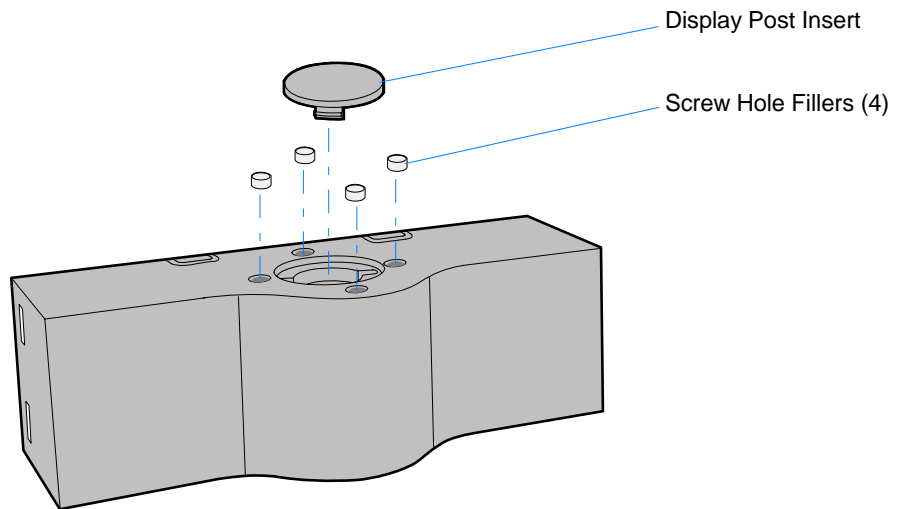
Screws

21463a

- b. Install the Cable Cover Brackets using three of the longer screws that are supplied in the kit and the black screw removed earlier.
- c. Install the remaining kit screw and plastic sleeve in the top center of the terminal.

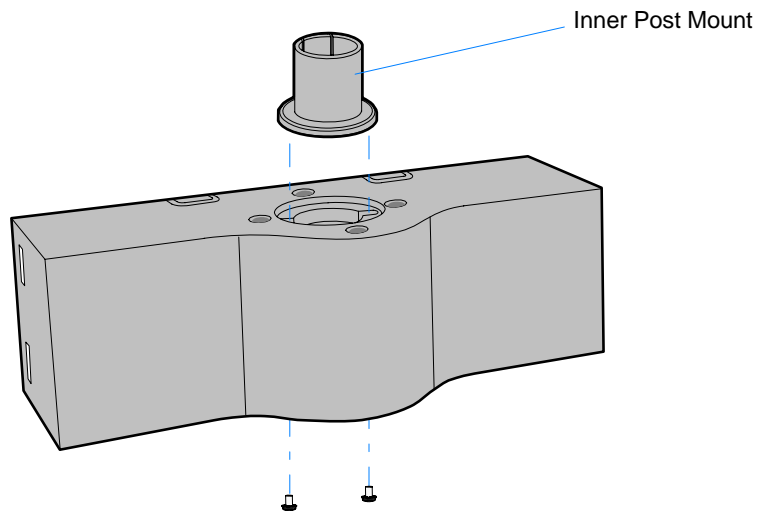


2. Remove the Display Post Insert and Screw Hole Fillers from the Cable Cover. These are easily pressed out.



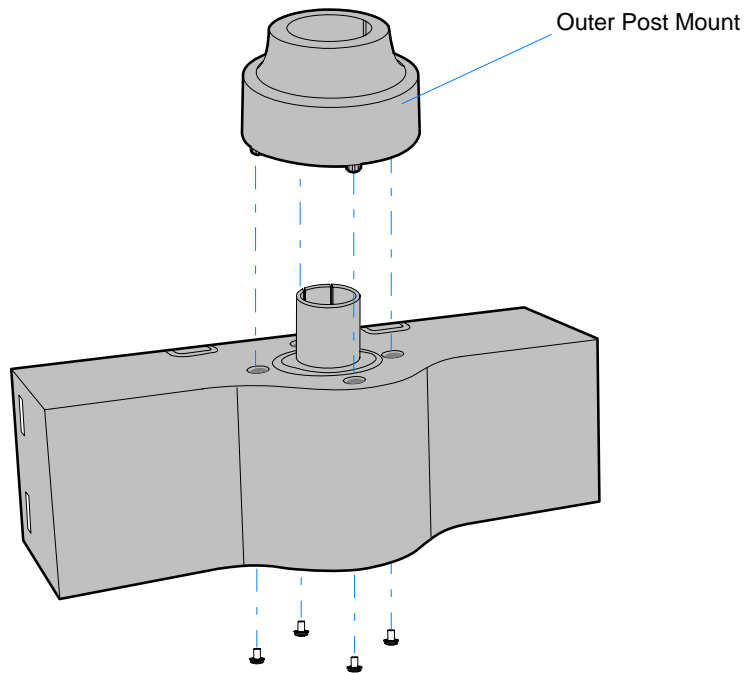
21664

3. Install the Inner Post Mount on the Cable Cover with screws (2).

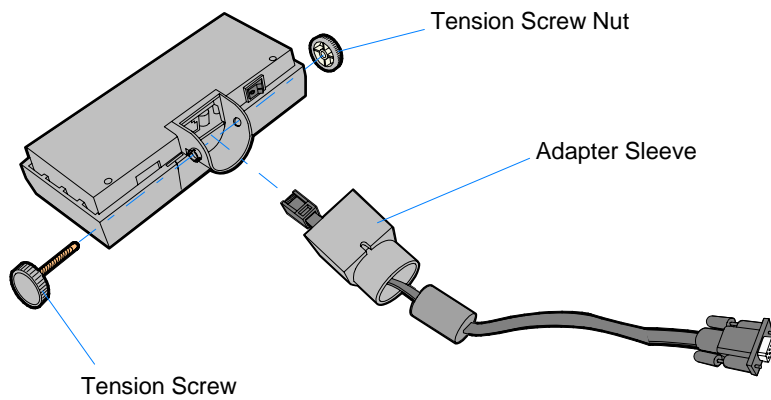


21663

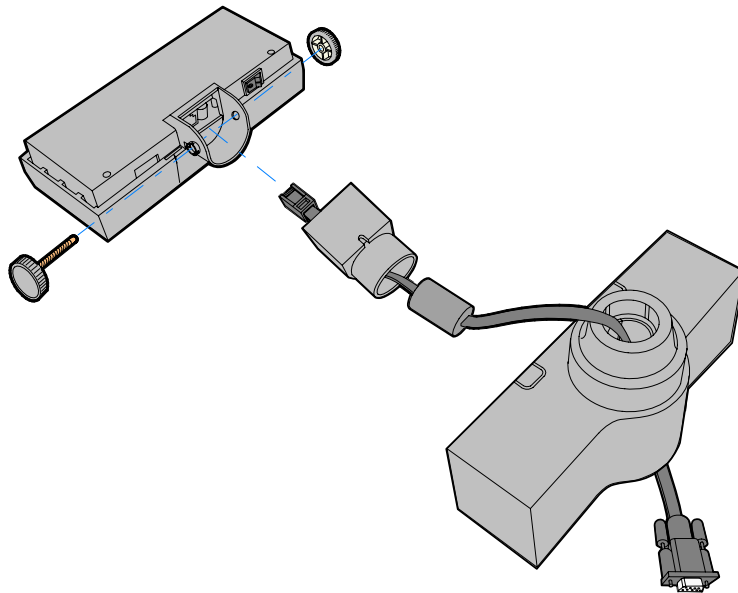
4. Install the Outer Post Mount on the Cable Cover with screws (4).



5. Unscrew the Tension Screw that secures the Adapter Sleeve to the display. Remove the sleeve and disconnect the cable.

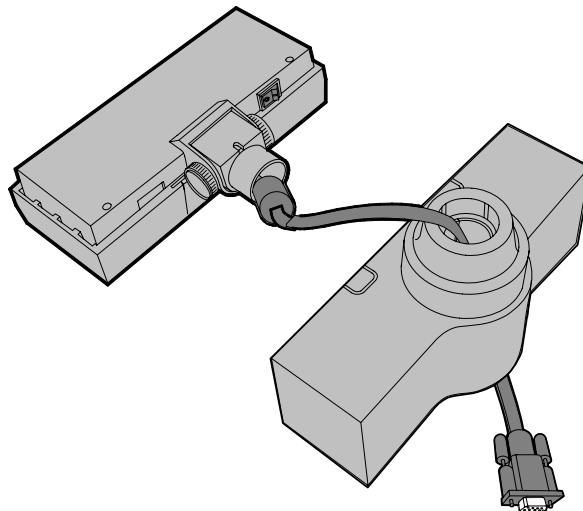


6. Route the cable through the Cable Cover and Adapter Sleeve.



21666

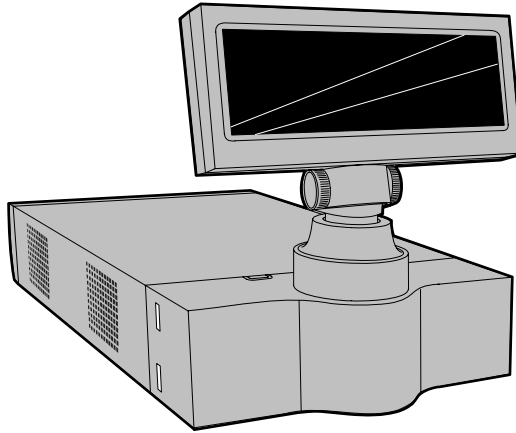
7. Connect the cable and install the Adapter Sleeve in the display, securing it with the Tension Screw.



21667

8. Connect the Display Cable to one of the RS-232 connectors on the terminal.

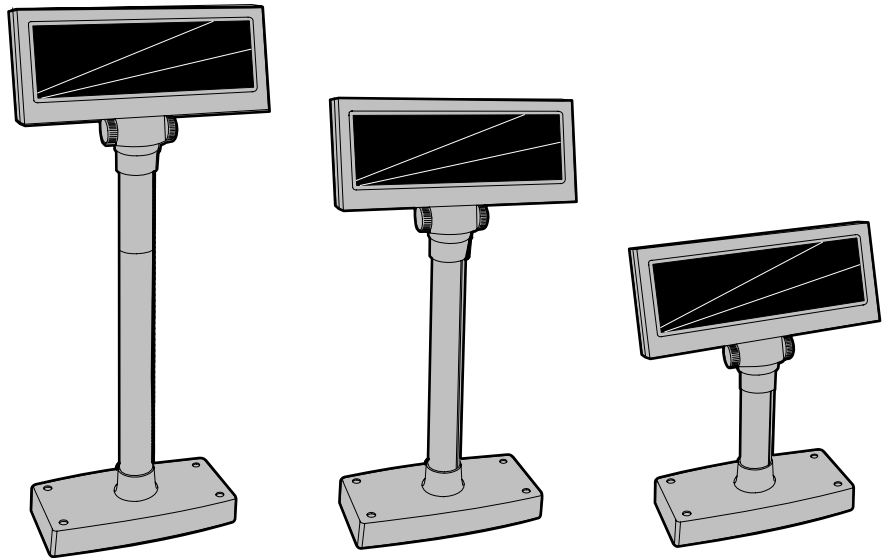
9. Insert the Display into the Cable Cover and then install the assembly onto the terminal.



21679a

Installing a Remote NCR 7446-K453 Customer Display

When the Customer Display (7446-K453) is combined with the Remote Base (7446-K454) it becomes a remote display. The post has various lengths, permitting different viewing heights for the display.

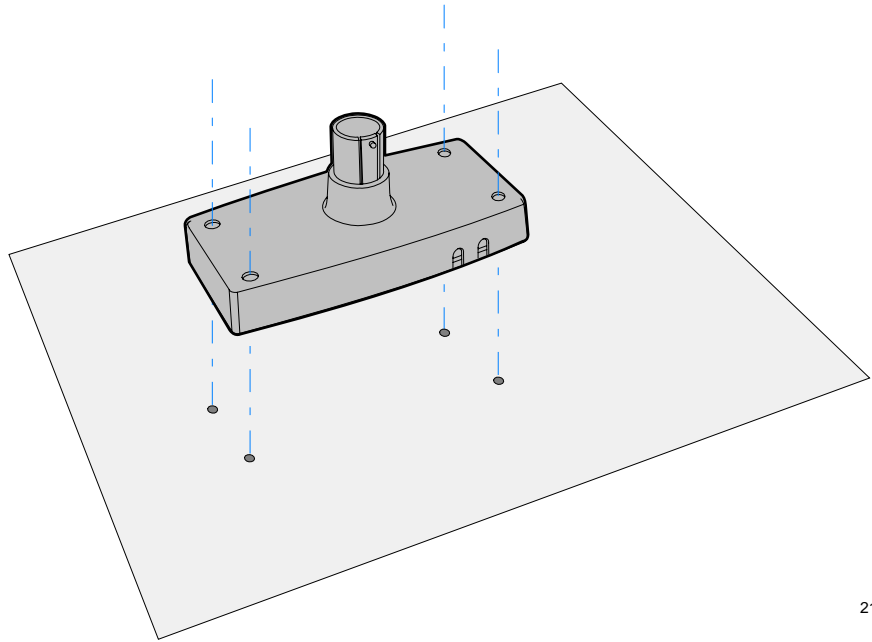


21677a

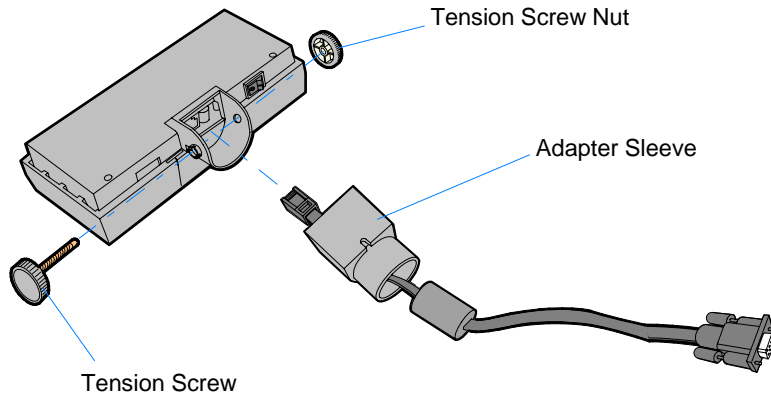
Installation Procedure

The Integrated Customer Display consists of two kits:

- NCR 7446-K453 Customer Display Kit
 - NCR 7446-K454 Customer Display Remote Base Kit
1. Using the Customer Display Base as a template mark the desired location for the four holes that will be drilled to mount the base.

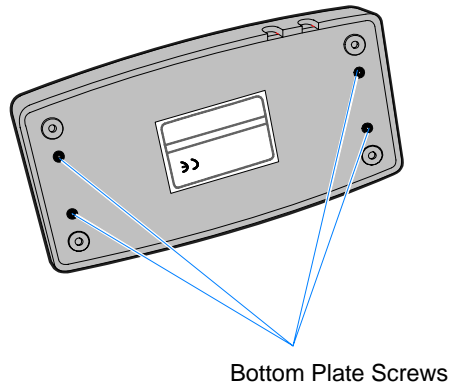


2. Remove the Cable Cover if applicable).
3. Unscrew the Tension Screw that secures the Adapter Sleeve to the display. Remove the sleeve and disconnect the cable.



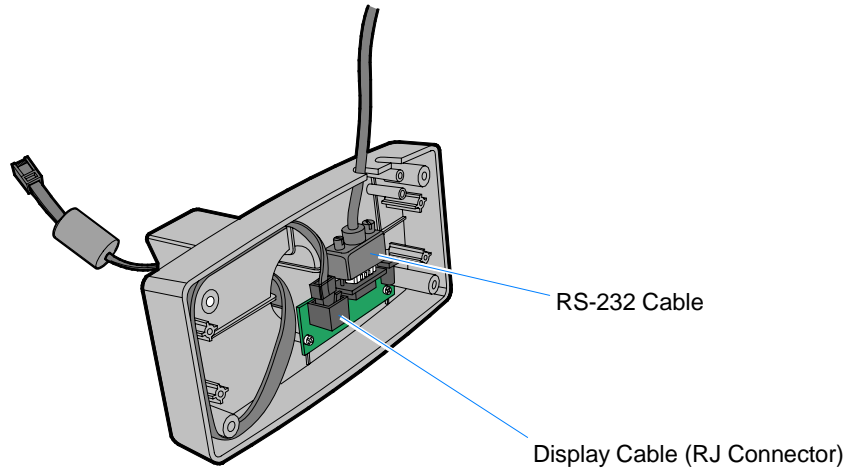
21685a

4. Remove the Base Plate from the Customer Display Base (4 screws).



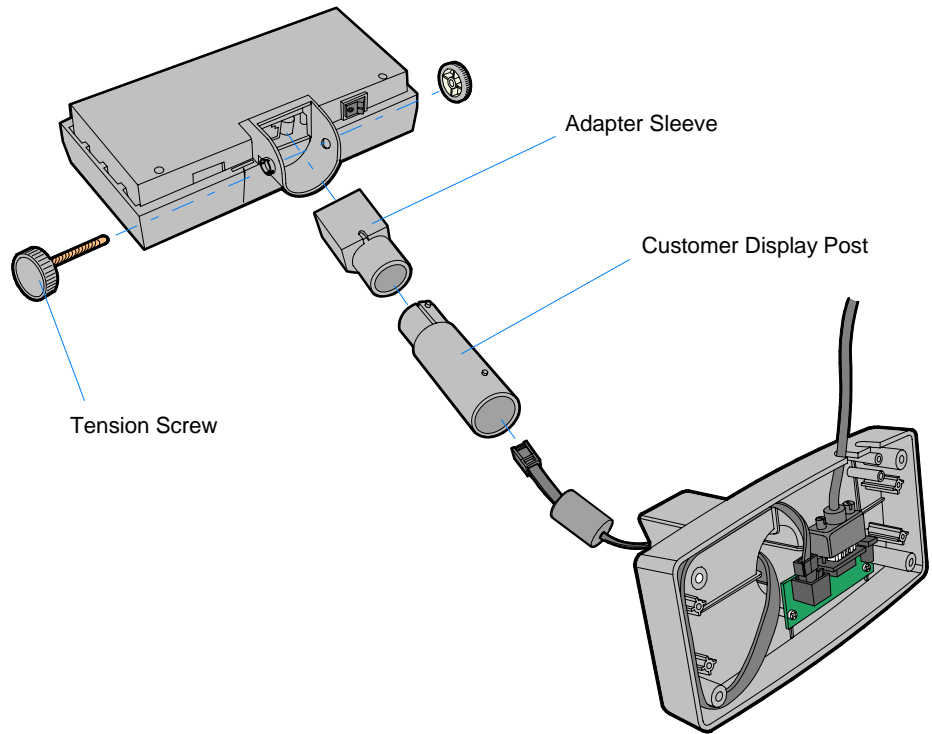
21678a

5. Route the Display Cable as shown below and connect it to the RJ connector on the Customer Display PCB.
6. Connect the RS-232 Cable as shown.

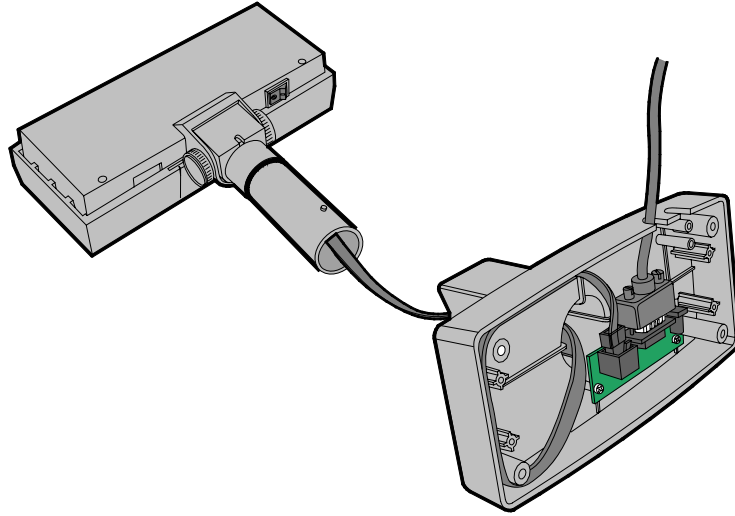


7. Route the Display Cable through the Customer Display Post and Adapter Sleeve.

Note: There are two Customer Display Posts included in the kit that can be used separately or combined to achieve the desired viewing height.



8. Connect the cable and install the Adapter Sleeve in the display, securing it with the Tension Screw.

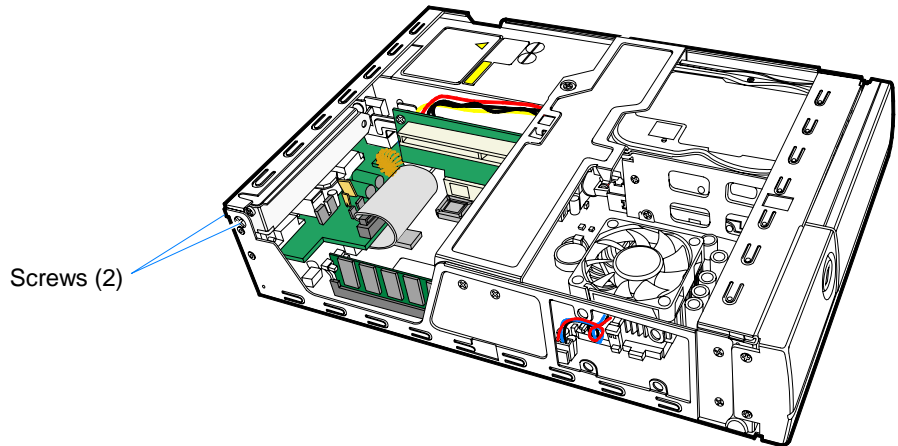


21686a

9. Replace the Base Plate on the Customer Display.
10. Connect the RS-232 Cable to one of the powered RS-232 connectors on the terminal.
Note: The default factory configuration for the RS-232 ports are: ports 1, 3, and 4 are powered; port 2 is not powered.
11. Connect the other peripheral cables.
12. Re-Install the Cable Cover on the terminal.
13. Mount the display to the table top using screws (4).

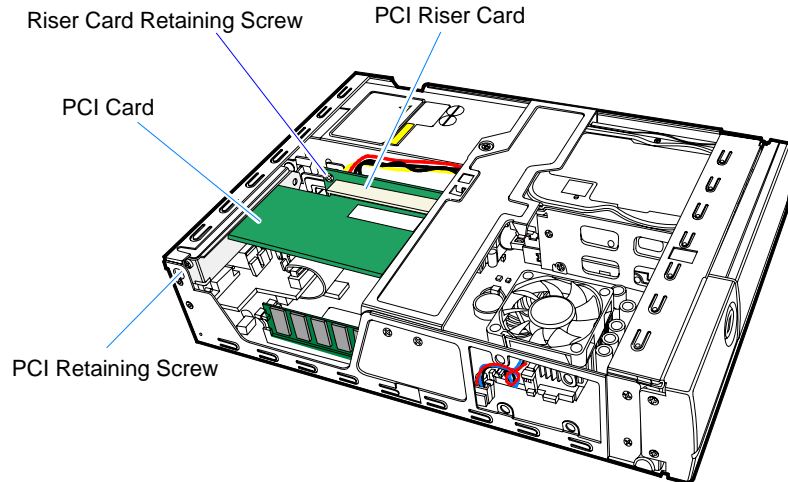
Installing a PCI Card

1. Remove the PCI Retaining Screw and the screw in the back of the terminal as shown below. The screw in the back gets in the way when you try to insert the PCI card.



2. Install the PCI Card in the PCI Riser Card slot.

Note: You may have to temporarily loosen the Riser Card Retaining Screw and reposition the Riser Card slightly in order to install the PCI Card.



21601

3. Secure the card with the PCI Retaining Screw.
4. Replace the screw in the back of the terminal.
5. Replace the Top Cover cabinet.

Installing a Cash Drawer

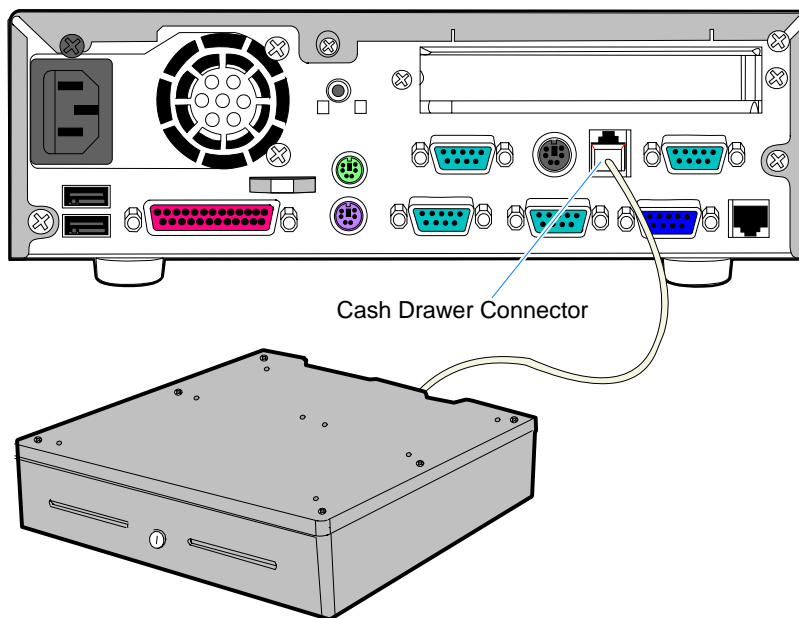
The small dimension of the RealPOS 30 permits the terminal to rest directly on most cash drawers. However, other peripherals like the keyboard or printer may or may not fit. The Cash Drawer can connect to the Cash Drawer connector or to the transaction printer.

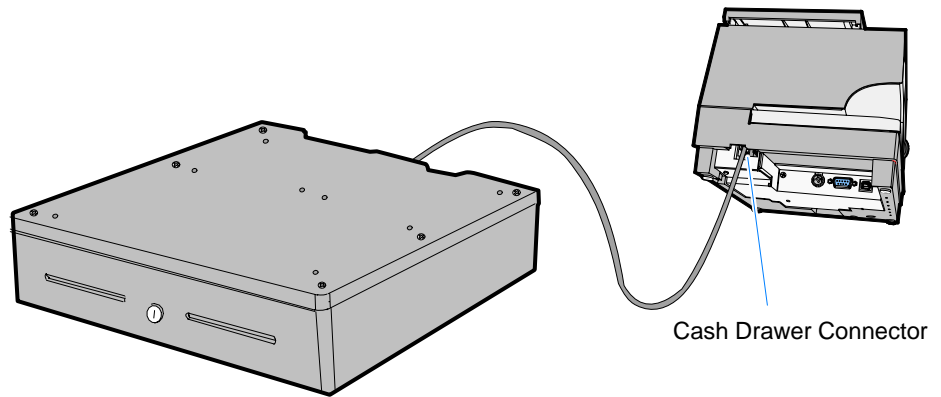
Note: The 7446 is not designed for integration with any current NCR cash drawer.

The 7446 supports the following Cash Drawers:

- 2185 Flip Top Drawer
- 2186 Compact Cash Drawer
- 2189 Full-size Cash Drawer

The Cash Drawer can be connected to the Back Panel on the 7446 or to the Cash Drawer Connector on the transaction printer.





20440

Note: The RealPOS 30 does not support a dual cash drawer configuration.

Chapter 3: Setup

Entering Setup

1. Apply power to the terminal.
2. When you see the NCR logo displayed press **[Del]**

How to Select Menu Options

The following keyboard controls are used to select the various menu options and to make changes to their values.

- Use the arrow keys to select (highlight) options and menu screens.
- Use the **[Enter]** key to select a submenu.
- Use the **[+]** and **[-]** keys to change field values.
- To view help information on the possible selections for the highlighted item, press **[F1]**.
- To save the changes, move the cursor to the *Exit Menu*, select either *Save Changes & Exit* or *Save Changes*, and press **[Enter]**.

BIOS Default Values

Standard CMOS Features

System Time	(variable)
System Date	(variable)
IDE Devices	(variable)
Video	[EGA/VGA]
Halt On	[All , But Keyboard]

Advanced Features

External Cache	[Enabled]
CPU L2 Cache ECC Checking	[Enabled]
Processor Number Feature	[Enabled]
Quick Power On Self Test	[Enabled]
First Boot Device	[Floppy]
Second Boot Device	[HDD-0]
Third Boot Device	[LAN]
Fourth Boot Device	[Disabled]
Boot Up Floppy Seek	[Disabled]
Boot Up NumLock Status	[On]
Typematic Rate Setting	[Disabled]
* Typematic Rate (Characters/Second)	6
* Typematic Delay (msec)	250
Security Option	[Setup]
HDD S.M.A.R.T Capability	[Disabled]
Report No FDD For WUB 95	[Yes]
Video BIOS Shadow	[Enabled]
C8000-CBFFF Shadow	[Disabled]
CC000-CFFFF Shadow	[Disabled]
D0000-D3FFF Shadow	[Disabled]
D4000-D7FFF Shadow	[Disabled]
D8000-DBFFF Shadow	[Disabled]
DC000-DFFFF Shadow	[Disabled]

Advanced Chipset Features

SCRAM CAS Latency Time	[Auto]
SCRAM Cycle Time Tras/Trc	[Auto]
SCRAM RAS to CAS Delay	[Auto]
SCRAM RAS Precharge Time	[Auto]
CPU Latency Timer	[Enabled]
AGP Graphics Aperture Size	[64MB]

Integrated Peripherals

Onboard LAN Boot ROM	[Enabled]
OnChip IDE Controller	
On-Chip Primary PCI IDE	[Enabled]
On-Chip Secondary PCI IDE	[Enabled]
IDE Primary Master PIO	[Auto]
IDE Primary Slave PIO	[Auto]
IDE Secondary Master PIO	[Auto]
IDE Secondary Slave PIO	[Auto]
Primary IDE Max. UDMA	[Auto]
IDE Primary Master UDMA	[Auto]
IDE Primary Slave UDMA	[Auto]
* Secondary IDE Max. UDMA	UMDA 33
IDE Secondary Master UMDA	[Auto]

IDE Secondary Slave UMDA	[Auto]
Onboard SuperIO Device	
On FDC Controller	[Enabled]
Serial Port 1	[3F8/IRQ4]
Serial Port 2	[2F8/IRQ3]
Serial Port 3	[3E8]
Serial Port 3 Use IRQ	[IRQ10]
Serial Port 4	[2E8]
Serial Port 4 Use IRQ	[IRQ11]
Parallel Port	[378/IRQ7]
Parallel Port Mode	[SPP]
* EPP Mode Select	EPP1.7
* ECP Mode Use DMA	3
Parallel Port 2	[3BC]
Parallel Port 2 Use IRQ	[IRQ5]
Parallel Port 2 Mode	[SPP]
* LPT2 ECP Mode Use DMA	1
USB Controller #1 (Rear)	[Enabled]
USB Controller #2 (Front)	[Enabled]
Init Display First	[PCI Slot]
AC97 Audio	[Auto]

Power Management Setup

Soft-Off by PWR-BTTN	[Instant Off]
PWRON After PWR-Fail	[Off]
POWER ON Function	[BUTTON ONLY]
* KB Power ON Password	Enter
* Hot Key Power ON	Ctrl-Esc
ACPI Function	[Enabled]
PCI PME/LAN Power On	[Disabled]
Power On by Ring	[Disabled]
RTC Power On	[Disabled]
* Date (of Month) Alarm	0
* Time (hh:mm:ss) Alarm	0 : 0 : 0

PnP/PCI Configurations

PNP OS Installed	[No]
Reset Configuration Data	[Disabled]
Resources Controlled By	[Auto(ESCD)]
* IRQ Resources	Press Enter
* DMA Resources	Press Enter
* Memory Resources	Press Enter
INT Pin 1 Assignment	[Auto]
INT Pin 2 Assignment	[Auto]
INT Pin 3 Assignment	[Auto]
INT Pin 4 Assignment	[Auto]
INT Pin 5 Assignment	[Auto]
INT Pin 6 Assignment	[Auto]
INT Pin 7 Assignment	[Auto]
INT Pin 8 Assignment	[Auto]

Chapter 4: Operating System Recovery

Introduction

This chapter discusses procedures on how to recover the Operating System by using the CD-ROM drive. The software is distributed on bootable CD-ROM media.

In the event your terminal does not have an internal CD-ROM drive, the 7446 supports the following external CD-ROM drives.

- Teac USB CD-ROM Drive (2336-K208)
- NCR Services: External CDR/W DVD-ROM Drive (603-9014774)

It is also possible to perform a BIOS update using a network connection. Refer to the *NCR FitClient Software User's Guide*, (B005-0000-1235) for information about that procedure.

Caution: When performing an OS recovery from a larger source image (larger disk) to a smaller destination disk, you must use a special procedure (see the *OS Recovery from a Larger Disk Image* section).

Prerequisites

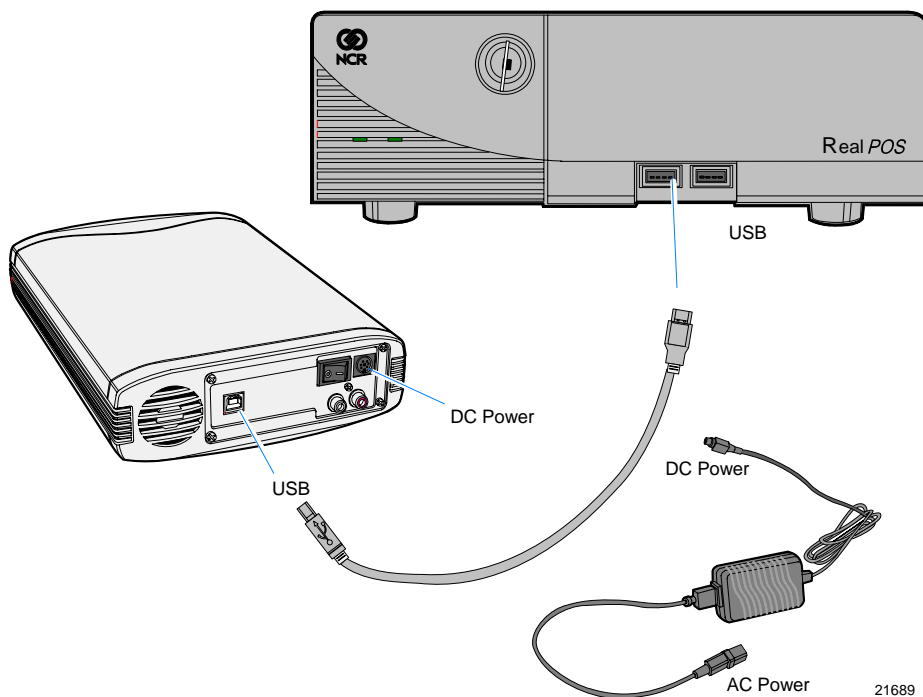
The following are required in order to perform an OS recovery from a CD.

- Bootable CD-ROM drive (internal or external)
- Keyboard

OS Recovery

Connecting an External USB CD-ROM Drive

1. Connect the external USB CD-ROM drive to a *USB* connector on the terminal.



2. Connect the Power Supply to the *DC Power* connector on the CD-ROM and to an AC outlet.
3. Apply power to the CD-ROM drive (switch on the back).

Recovery Procedures

1. Apply power to the terminal.
2. Press **[DEL]** during boot to enter Setup.
3. At the Setup Utility menu, select **Advanced BIOS Features**.
4. Set the **First Boot Device**.
 - If you are using the internal CD-ROM drive, select **CDROM**.
 - If you are using an external USB CD-ROM drive, select **USB-CDROM**.
5. Press **[Esc]** to return to the Setup Utility menu.
6. Select **Save and Exit Setup**.
7. As the system reboots, insert the *NCR Partition Image Application* CD (D370-0605-0100). You should see a message during boot, indicating that the CD-ROM has been recognized.
8. At the menu, enter **1** to select the image restore function.

```
#####  
      NCR Partition Image Application  
#####
```

Select an option

- 1 - Restore an Image from CD
- 2 - Exit to a shell with no network connection
- 3 - Exit to a shell and make a network connection

9. At the prompt, insert the CD which contains the operating system image. Press **[Enter]**.

7446-2xxx	Windows XPe	D370-0619-0100
7446-2xxx	Windows XPe w/SP2	D370-0673-0100
7446-3xxx	Windows XPe wSP2	D370-06xx-0100
7446-2xxx	Windows XP Pro	D370-0634-0100
7446-2xxx	Windows XP Pro w/SP2	D370-0634-0100
7446-3xxx	Windows XP Pro w/SP2	D370-06xx-0100
7446-2xxx	WePOS	D370-0692-0100
7446-3xxx	WePOS	D370-06xx-0100
7446-2xxx	NLPOS	D370-0697-0100
7446-3xxx	NLPOS	D370-06xx-0100
7446-2xxx	DOS	D370-0623-0100
7446-3xxx	DOS	D370-06xx-0100

10. At the prompt to continue, press **1** (Yes) and **[Enter]** to continue.
11. Press **[Enter]** to mount the CDROM, or **[*]** to cancel.

```
+-----+ Automatic mount +-----+
|
| Please press "ok" to mount
| [/dev/cdrom] on [mnt/cdrom]
|
|                                     +-----+
|                                     |  Ok  |
|                                     +-----+
|
+-----+
```

Chapter 5: 2x20 Customer Display (7446-K453)

Features

- Data is displayed on two 20-column lines.
- Large blue-green characters
- The DIP switch settings emulate the command mode, baud rate, and which international character set.
- Command emulation modes include RealPOS 20 and Epson ESC/POS.
- The display area can be controlled by Windows.
- RS-232 Interface; baud rate from 4800 to 38400 bps.
- Reverse characters can be specified using the Epson command set.

General Specifications

ITEM	Descriptions
Display method	Vacuum fluorescent display
Number of character	40 characters (20 columns x 2 lines)
Character font	5 x 7 Dot matrix
Display color	Blue green
Brightness	700 cd /m ²
Character type	96 alphanumeric 13 kinds of international character set
Character size	9.0mm x 5.25mm
Power supply	12 Vdc
Power consumption	3 - 6 W
Panel dimensions	224 (W) x 93 (H) x 50(D) mm
Support dimensions	Long support : 22 cm Short support : 9 cm
Base dimensions	190(w)x55(h)x96(d)mm
Viewing angle	-5 - 60 degrees
Rotation angle	Maximum 270 degrees
Weight	1.25 Kg
Operating temperature	5 - 45°C
Operating Humidity	30%-85%
Storage Temperature	-10 - 55°C
Storage Humidity	10%-85%

Interface

Specifications

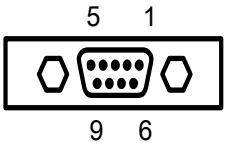
Data transmission:	Serial
Synchronization:	Asynchronous
Handshaking:	DTR / DSR
Signal level:	MARK = -3 to -15 V (logic "1") SPACE = +3 to +15 V (logic "0")
Baud rates:	4800,9600 *,19200,38400 bps
Parity:	None *, even
Bit length:	8 bits
Stop bits:	1 or more

* Default setting

Connector Pinouts

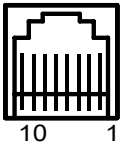
RS232C Link to PC/HOST Connector

CN2 / Connector type: D-sub 9 pin female



Pin Assignment

No	Signal	Direction	Function description
2	RXD	From PC/Host to display	Receive data
3			
4			
5	GND	-	Signal ground
6	DSR	From display to PC/Host	Display ready signal
8	DSR	From display to PC/Host	Display ready signal



Display Panel Connector

CN3 / Connector type: Phone-jack 10P/8C

Pin assignment

No	Signal	Direction	Function description
2,3	Vin	-	Power 12 Vdc
4,5	GND	-	Signal ground
6			
7	DTR	From Display to PC/Host	Display ready signal
8			
9	TXD	From Display to Printer	Printer status data signal

Dip Switch and Software Setting

Command Type Selection

SW1	SW2	SW3	Command type	Default
ON	ON	ON	NCR RealPOS 20	*
OFF	ON	ON	ESC/POS	

Baud Rate Selection

SW8	SW9	Baud rate (bps)	Default
ON	ON	4800	
OFF	ON	9600	*
ON	OFF	19200	
OFF	OFF	38400	

Parity Check Selection

SW10	Parity check	Default
ON	None-parity	*
OFF	Even-parity	

Demo Mode Selection

SW11	Show demo string	Default
ON	Enable	
OFF	Disable	*

International Character Set

SW4	SW5	SW6	SW7	Character set	Code table (80H-FFH)	Default
ON	ON	ON	ON	U.S.A.	PC-437(USA, standard Europe)	*
OFF	ON	ON	ON	FRANCE	PC-858 (multilingual + Euro Symbol)	
ON	OFF	ON	ON	GERMANY	PC-858 (multilingual + Euro Symbol)	
OFF	OFF	ON	ON	U.K.	PC-858 (multilingual + Euro Symbol)	
ON	ON	OFF	ON	DENMARK I	PC-858 (multilingual + Euro Symbol)	
OFF	ON	OFF	ON	SWEDEN	PC-858 (multilingual + Euro Symbol)	
ON	OFF	OFF	ON	ITALY	PC-858 (multilingual + Euro Symbol)	
OFF	OFF	OFF	ON	SPAIN	PC-858 (multilingual + Euro Symbol)	
ON	ON	ON	OFF	JAPAN	Katakana	
OFF	ON	ON	OFF	NORWAY	PC-858 (multilingual + Euro Symbol)	
ON	OFF	ON	OFF	DENMARK II	PC-858 (multilingual + Euro Symbol)	
OFF	OFF	ON	OFF	SLAVONIC	PC-852	
ON	ON	OFF	OFF	RUSSIA	PC-866	
OFF	ON	OFF	OFF	PORTUGUESE	PC860	

SW4	SW5	SW6	SW7	Character set	Code table (80H-FFH)	Default
ON	OFF	OFF	OFF	Not used		
OFF	OFF	OFF	OFF	Not used		

Command Control

SW12	Function	Default
ON	Depends on how SW1~SW11 are set.	*
OFF	Bypasses SW1~SW11 settings and uses the NCR RealPOS 20 settings. Baud rate: 9600 Parity: None Demo Mode: Disabled Character set: USA, Standard Europe	

Command List Table

Table –1

	NCR RealPOS 20	EPSON ESC/POS
Move cursor right	O	O
Move cursor left	O	O
Move cursor up	O	O
Move cursor down	O	O
Move cursor to right-most position	O	O
Move cursor to left-most position	O	O
Move cursor to home position	O	O
Move cursor to bottom position		O
Move cursor to specified position	O	O
Clear display screen	O	O
Clear cursor line	O	O
Brightness adjustment		O
Blink display screen	O	O
Initialize display	O	O
Select character code table		O
Select international character set		O
Select/cancel reverse character		O
Overwrite mode	O	O
Vertical scroll mode	O	O
Horizontal scroll mode	O	O

	NCR RealPOS 20	EPSON ESC/POS
Set/cancel the window range		O
Select peripheral device		O
Set starting/ending position of macro definition		O
Execute and quit macro		O
Execute self-test		O
Display time		O
Display time continuously		O
Display position		
Cursor on/off	O	O
Change to UTC enhanced mode		
Change to UTC standard mode		
Write string to upper line	O	
Write string to lower line	O	
Upper line message scroll continuously	O	
Bottom line message scroll continuously	O	
Message vertical down scroll continuously	O	
Message vertical upper scroll continuously	O	
Carriage return	O	
Line feed	O	
Back space	O	
Horizontal tab	O	
Command type select		O

Table-2

	NCR REALPOS 20	EPSON ESC/POS
Upper line message scroll once pass		
Change attention code		
Two line display		
Clear upper line and move cursor to upper left-end position		
Clear bottom line and move cursor to bottom left-end position		
Set period to upper line, last n position		
Set line blinking, upper line	O	
Clear line blinking, upper line	O	
Clear field 1 and move cursor to field 1, first position		
Clear field 2 and move cursor to field 2, first position		
Clear display range from n position to m position and move cursor to n position		
Save the current displaying data to n layer for demo display		
Turn enunciator on/off		O
Specify period		O
Specify comma		O
Specify semicolon (period + comma)		O

Commands

RealPOS 20 Standard Mode Command List

Command	Code (hex)	Function Description
ESC F A .. CR	1B 46 41 [DATA X 40] 0D	Write string to upper line
ESC F B .. CR	1B 46 42 [DATA X 40] 0D	Write string to lower line
ESC F D .. CR	1B 46 44 [DATA X 40] 0D	Upper line message scroll continuously
ESC F O .. CR	1B 46 4F [DATA X 40] 0D	Bottom line message scroll continuously
ESC P x y	1B 50 x y $1 \leq x \leq 20, y=1,2$	Move cursor to specified position
ESC _ n	1B 5F n n=00,01	Set cursor on/off
ESC DC1	1B 11	Overwrite mode
ESC DC2	1B 12	Vertical scroll mode
ESC DC3	1B 13	Horizontal scroll mode
ESC @	1B 40	Initialize display
US MD2 n	1F 02 n n=01~0Ch	Message vertical down scroll continuously
US MD1 n	1F 01 n n=01~0Ch	Message vertical upper scroll continuously
US DC1 n	1F 11 n n='1','2'	Set line blinking N='1' up line , n='2' low line
US DC2 n	1F 12 n n='1','2'	Clear line blinking N='1' up line , n='2' low line
US E n	1F 45 n n=0~FFh	Blink display screen
NULL H	0 48	Move cursor up
NULL K	0 4B	Move cursor left
NULL M	0 4D	Move cursor right

Command	Code (hex)	Function Description
NULL P	0 50	Move cursor down
NULL G	0 47	Move cursor to left-most position
NULL O	0 4F	Move cursor to right-most position
BS	08	Back space
HT	09	Horizontal tab
LF	0A	Line feed
HOM	0B	Move cursor to home position
CLR	0C	Clear display screen
CR	0D	Carriage return
CAN	18	Clear cursor line, clear string mode

EPSON ESC/POS Command List-1

Command	Code (hex)	Function description
HT	09	Move cursor right.
BS	08	Move cursor left.
US LF	1F 0A	Move cursor up.
LF	0A	Move cursor down.
US CR	1F 0D	Move cursor to right-most position.
CR	0D	Move cursor to left-most position.
HOM	0B	Move cursor to home position.
US B	1F 42	Move cursor to bottom position.
US \$ x y	1F 24 x y (x=1~20, y=01,02)	Move cursor to specified position.
CLR	0C	Clear display screen.
US X n	1F 58 n (01 ≤ n ≤ 04)	Brightness adjustment.
US E n	1F 45 n (n=00~ffh)	Blink display screen.
ESC @	1B 40	Initialize display.
ESC t n	1B 74 n (n=00-0fh)	Select character code table.
ESC R n	1B 52 n (n=00-0fh)	Select international character set.
US r n	1F 72 n (n=00,01)	Select/cancel reverse character.
US MD1	1F 01	Specify overwrite mode.
US MD2	1F 02	Specify vertical scroll mode.
US MD3	1F 03	Specify horizontal scroll mode.

Command	Code (hex)	Function description
CAN	18	Clear cursor line
ESC # n	1B 23 n (30h \leq n \leq 38h)	Command type select
US # n m	1F 23 n m, (n=0 or 1, 0<m \leq 20)	Turn enunciator on/off
US C n	1F 43 n (n=1,31 then on)	Set cursor on/off
US . n	1F 2E n, n=a displayable character code	Specify period
US , n	1F 2C n, n=a displayable character code	Specify comma
US ; n	1F 3B n, n=a displayable character code	Specify semicolon (period + comma)

EPSON ESC/POS Command List-2

Command	Code (hex)	Function description
ESC W n s x1 y1 x2 y2	1B 57 n s x1 y1 x2 y2 n=1,2,3,4 s=0,1	Specify/cancel the window range. 1<=x1<=x2<=20 1<=y1<=y2<=2
ESC = n	1B 3D n n=1,31, select printer n=2,32, select display n=3,33, select printer, display	Select peripheral device.
US :	1F 3A	Set starting/ending position of macro definition. Ex.: 1F 3A (macro string) 1F 3A
US ^ n m	1F 5E n m 00 ≤ (n, m) ≤ ff n=Word time m=show string time	Execute and quit macro. It's an interval of n between the two word. It's an interval of m between the two string.
US @	1F 40	Execute self - test
US T h m	1F 54 h m 0<=h<=17h, 0<=m<=3bh	Display time
US U	1F 55	Display time continuously

Set International Font for ESC/POS (Table 7-11)

n	International font set	n	International font set
0	U.S.A	7	SPAIN
1	FRANCE	8	JAPAN
2	GERMANY	9	NORWAY
3	U.K.	10	DENMARK II
4	DENMARK I	11	SLAVONIC
5	SWEDEN	12	RUSSIA
6	ITALY	15	Reserved

Select Code for ESC/POS (Table 7-12)

n	International font set (80H-FFH)
0	Page 0, (PC437: U.S.A., standard Europe)
1	Page 1, (Katakana for Japan)
2	Page 2, (PC858: multilingual + Euro symbol)
3	Page 3, (PC860: Portuguese)
4	Not supported
5	Not supported
6	Page 6, (PC852: SLAVONIC)
7	Page 7, (PC866: RUSSIA)

Character Sets

International Character Sets

ASCII Code													
Country	Hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
	Dec	35	36	64	91	92	93	94	96	123	124	125	126
U.S.A	#	\$	@	[\]	^	`	{		}	~	
France	#	\$	à	°	ç	§	^	`	é	ù	è	¨	
Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß	
U.K	£	\$	@	[\]	^	`	{		}	~	
Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~	
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü	
Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì	
Spain	Pt	\$	@	¡	Ñ	¿	^	`	¨	ñ	}	~	
Japan	#	\$	@	[¥]	^	`	{		}	~	
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü	
Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü	
Slavonic	#	\$	@	[\]	^	`	{		}	~	
Russia	#	\$	@	[\]	^	`	{		}	~	

USA, Standard Character Sets (20H – 7EH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
20H	SP	!	"	#	\$	%	&	'	()	ç	+	,	-	.	/
30H	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40H	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50H	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
60H	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70H	p	q	r	s	t	u	v	w	x	y	Z	{		}	~	SP

Page 0 (PC437: USA, Standard Europe) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90H	É	æ	Æ	ô	ö	ò	û	ù	ÿ	ö	Ü	¢	£	¥	Pt	f
A0H	á	í	ó	ú	ñ	Ñ	a	o	¿	¬	½	¼	j	«	»	
B0H	☐	☐	☐		┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
C0H	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
D0H	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
E0H	α	β	Γ	π	Σ	σ	μ	τ	Φ	θ	Ω	δ	∞	ø	∈	∩
F0H	≡	±	≥	≤			÷	≈	°	•	.	√	n	2	■	SP

Page 1 (Katakana) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	α	β	γ	\triangle	\in	η	θ	λ	μ	π	ρ	σ	τ	Φ	Ω	Σ
90H	f	§	IE	IR	∫	$\overline{\times}$	ف	⁻¹	²	³	x	1/2	1/	√	±	■
A0H	SP	。	「	」	、	・	□	□	□	□	□	□	□	□	□	□
B0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
C0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
D0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	"	。
E0H	↑	↓	←	→	↙	↘	↗	↖	↵	↔	”	“	«	»	∴	∵
F0H	≤	≥	≠	÷	∥		⊥	※	※	~	~	≡	〒	Ω	⊕	⊖

Page 2 (PC858: Multilingual+ Euro Symbol) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
90H	É	æ	Æ	ô	ö	ò	û	ù	ÿ	ö	Ü	ø	£	Ø	×	f
A0H	á	í	ó	ú	ñ	Ñ	a	o	¿	®	¬	½	¼	j	«	»
B0H	☐	☐	☐		†	Á	Â	À	©	¶	¶	¶	¶	¢	¥	₱
C0H	ℒ	⊥	⊥	†	—	†	ã	Ã	ℒ	ℒ	ℒ	ℒ	ℒ	=	ℒ	ℒ
D0H	ø	Ð	Ê	Ë	È	€	Í	Î	Ï	⌋	⌋	■	■	!	ì	■
E0H	ó	ß	ô	ò	õ	Õ	μ	þ	Þ	Ú	Û	Ü	ý	Ý	-	'
F0H	-	±	=	¾	¶	§	÷	,	°	“	”	¹	³	²	■	SP

Page 3 (PC860: Portuguese) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	Ç	ü	é	â	ã	à	Á	ç	ê	Ê	è	Í	Ô	ì	Ã	Â
90H	É	À	È	ô	õ	ò	Ú	ù	Ì	Õ	Ü	¢	£	Ù	Pt	Ó
A0H	á	í	ó	ú	ñ	Ñ	a	o	¿	Ò	¬	½	¼	j	«	»
B0H					┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
C0H	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
D0H	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘	┌	┐	└	┘
E0H	α	β	Γ	π	Σ	σ	μ	τ	Φ	θ	Ω	δ	∞	ø	∈	∩
F0H	≡	±	≥	≤	∫	∫	÷	≈	°	•	.	√	n	2	■	SP

Page 6 (Slavonic) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	Ç	ü	é	â	ä	û	ć	ç	İ	ë	õ	õ	î	ž	ä	ć
90H	é	Í	í	ô	ö	Ĺ	ĩ	ś	ś	Ö	Ü	Ŧ	ţ	ı	x	č
A0H	á	í	ó	ú	ą	ą	ż	ż	ę	ę		ż	č	ş	«	»
B0H					┌	á	â	ě	ş					ž	ž	
C0H					—	+	ă	ă						=		⌘
D0H	┌	┐	ā	ë	ā	ñ	í	î	ě			■	■	ţ	û	■
E0H	ó	β	ô	ń	ń	ň	š	š	ř	ú	ř	ũ	ý	ý	ţ	´
F0H	—	˘	,	˘	˘	§	÷	˘	°	˘	˘	ũ	ř	ř	■	SP

Page 7 (Russia) (80H – FFH)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
80H	A	Б	В	Г	Д	Е	Ж	З	Й	Ї	К	Л	М	Н	О	П
90H	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
A0H	a	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
B0H																
C0H																
D0H																
E0H	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	’я
F0H	ð	Г	К	Н	θ	Υ	Υ	h	ð	г	к	н	θ	Υ	Υ	SP

Command details

Overwrite Mode

In this mode, the cursor moves from left to right, beginning at the upper left position. When the cursor reaches the end of the upper line, it then moves to the beginning (left end) of the bottom line. When the cursor reaches the end of the bottom line, it then moves back to beginning of the upper line and overwrites the previous characters.

Vertical Scroll Mode

In this mode, the cursor moves from left to right, beginning at the upper left position. When the cursor reaches the end of the upper line, it then moves to the beginning (left end) of the bottom line.

Horizontal Scroll Mode

In this mode, the horizontal movement of the cursor is limited to a predefined range and is limited to the upper line. (See the *Set or Cancel Window* command to set the default window as the entire upper line.)

The cursor moves from left to right, beginning at the left end of the *range*, and moves to the right until it reaches the end of the *range*. Additional characters then push the existing characters to the left, scrolling the characters to the left.

Set the String Display Mode, and Write String to Display

To set the String Display Mode, write to the upper or lower line.

d1 d2 d3 dn $\{1 \leq n \leq 20\}$

A = upper line

B = lower line

The String Display Mode is cancelled and returns to the last mode after receiving the CLR or CAN command.

Upper Line Message Scroll Continuously

The message (previously defined) scrolls continuously in the horizontal direction until a new command is received.

Move Cursor Left

This command moves the cursor to the left. It operates differently when the cursor is at the beginning of the line, depending on which display mode is used.

Overwrite Mode: When the cursor reaches the beginning of the lower line, it then moves to the end of the upper line and overwrites the previous character. When it reaches the left end of the upper line, it then moves to the end of the lower line.

Vertical Scroll Mode: When the cursor reaches the beginning of the lower line, the lower line then scrolls up and replaces the upper line. The lower line is cleared and the cursor moves to the end of the lower line.

Horizontal Scroll Mode: The cursor remains stationary.

Move Cursor Right

This command moves the cursor to the right. It operates differently when the cursor is at the end of the line, depending on which display mode is used.

Overwrite Mode: When the cursor reaches the end of the lower line, it then moves to the beginning of the upper line and overwrites the previous character. When it reaches the end of the upper line, it then moves to the beginning of the lower line and overwrites.

Vertical Scroll Mode: When the cursor reaches the end of the lower line, the lower line scrolls up to replace the upper line. The lower line is cleared and ready for new characters.

Horizontal Scroll Mode: The cursor remains stationary.

Move Cursor Up

This command moves the cursor up one line. It operates differently when the cursor is on the upper line, depending on which display mode is used.

Overwrite Mode: The cursor moves to the same column in the lower line.

Vertical Scroll Mode: The characters displayed on the upper line are scrolled to the lower line and the upper line is cleared. The cursor remains in the same position.

Horizontal Scroll Mode: The cursor remains stationary.

Move cursor down

This command moves the cursor down one line. It operates differently when the cursor is on the lower line, depending on which display mode is used.

Overwrite Mode: The cursor moves to the same column in the upper line.

Vertical Scroll Mode: The characters displayed on the lower line are scrolled to the upper line and the lower line is cleared. The cursor remains in the same position.

Horizontal Scroll Mode: The cursor remains stationary.

Vertical scroll

The characters displayed on the lower line are scrolled to the upper line and the lower line is cleared. The cursor remains in the same position.

Horizontal scroll mode: The cursor remains stationary.

Move Cursor to Home Position

The cursor moves to the beginning of the upper line

Move Cursor to Left-Most Position

The cursor moves to the beginning of the current line.

Move Cursor to Right-Most Position

The cursor moves to the end of the current line.

Move Cursor to Bottom Position

The cursor moves to the end of the lower line.

Move Cursor to Specified Position

The cursor moves to the x column on the y line.

Initialize Display

The data in the input buffer is cleared and reset to the default value.

Reset the Window

Resets the window on the display. When $s=0$, the window is cancelled (values: $x1$, $x2$, and y are not required.)

When $s=1$ the window is reset (values: $x1$, $x2$, and y are required.) $x1$ and $x2$ set the position of the left column and right column, respectively, of the window. y sets the upper or lower line of the window. This function is valid only in the *Horizontal Mode*.

Clear Display Screen, and Clear String Mode

The displayed characters are cleared and the String Mode is cancelled.

Clear current line, and cancel string mode

The current line is cleared and the string mode is cancelled.

Brightness adjustment

Adjusts the brightness of the vacuum fluorescent display.

When $n=3$, brightness=70%

When $n=4$, brightness=100%

Set cursor ON or OFF

When $n=0$, cursor is OFF

When $n=1$, cursor is ON

Control Code Set

HEX	CODE	HEX	CODE
00H	NULL	10H	DLE
01H	SOH, MD1	11H	DC1
02H	STX, MD2	12H	DC2
03H	ETX, MD3	13H	DC3
04H	EOT, MD4	14H	DC4
05H	ENQ, MD5	15H	NAK
06H	ACK, MD6	16H	SYN
07H	BEL, MD7	17H	ETB
08H	BS, MD8	18H	CAN
09H	HT	19H	EM
0AH	LF	1AH	SUB
0BH	VT, HOM	1BH	ESC
0CH	FF, CLR	1CH	FS
0DH	CR	1DH	GS
0EH	SO, SLE1	1EH	RS, SF1
0FH	SI, SLE2	1FH	US, SF2

Code Example

```
#include      <dos.h>
#include      <stdio.h>
#include      <graphics.h>
#include      <bios.h>
#include      <conio.h>
#include      <malloc.h>

#define CR    13
#define ESC   27

union REGS regs ;
char title[] = "\n\n          VFD Testing Program " ;
char line1[] = "\n   Comport Select 1:Com1 2:Com2 3:Com3 4:Com4
6:Com6  Esc:Quit : " ;
char line2[] = "Test Prog 8/ 1/2000\n" ;
char low_line[] = "Send string to line2\n" ;
char fix_p[] = "0K2000,+25000\n" ;
char string[] = "DemoProgramm";
char string2[] = "Welcome !!2003/06/29";
        unsigned   ComPort,count,ComSelect;
        unsigned   Status,j,k,c,d,ch,chold;
void main()
{

        unsigned           data ;
        char                *ComData;
        int                 tempLoop;
        unsigned char charcount1,charcount2;
ProgramStart:
        clrscr();
        printf(title);
        printf(line1);
ComPort_Select:
        ComSelect=getch();
        switch(ComSelect){
                case('1'): ComPort=0;ComData="Now = COM1,9600,N,8,1      "; break;
                case('2'): ComPort=1;ComData="Now = COM2,9600,N,8,1      "; break;
                case('3'): ComPort=2;ComData="Now = COM3,9600,N,8,1      "; break;
                case('4'): ComPort=3;ComData="Now = COM4,9600,N,8,1      "; break;
                case('6'): ComPort=5;ComData="Now = COM6,9600,N,8,1      ";
break;
                case(ESC): goto programmend;break;
        }
```

```

    default: printf("\n      Error!!");cur_homeB();goto
ComPort_Select;break;
}
charcount1=0;
charcount2=0;
ch=1;
data = _COM_CHR8 | _COM_STOP1 | _COM_NOPARITY | _COM_9600 ;
_bios_serialcom(_COM_INIT, ComPort , data) ;
cur_homeA();
printf("\n      Press any key to show (F10 to quit)  ") ;
printf(ComData);
printf("\n                      \n");
/*_bios_serialcom(_COM_SEND,ComPort,0x1b);
_bios_serialcom(_COM_SEND,ComPort,0x47);
for(tempLoop=0;tempLoop<1920;tempLoop++)
{
    _bios_serialcom(_COM_SEND,ComPort,0x58);
}*/
do
{
    if(kbhit()) //check if hit any key
    {
        c=getch();
        if (c==68 && d==0)
            goto programmend;

printf("\n      Input Data  ====  %d  ====      %c",c,c);
_bios_serialcom(_COM_SEND,ComPort,c);
}
/*if(charcount1<20)
{
    _bios_serialcom(_COM_SEND,ComPort,string[charcount1]);
    printf("\n%c--%i--",;
    charcount1++;
}
else
{
    if(charcount2<20)
    {
        _bios_serialcom(_COM_SEND,ComPort,string2[charcount2]);
        charcount2++;
    }
    else
    {
        charcount1=0;
        charcount2=0;
    }
}
delay(500);*/
//d=c;

```

```
        //ch++;
        //if (ch>15)
        //    { cur_home();
        //      for (chold=1;chold<16;chold++)
        //          delline();
        //      ch=1; }
        //    }
        while(1);
        programmend:
    }
    cur_home()
    {
        regs.h.ah = 2;
        regs.h.bh = 0;
        regs.h.dh = 5;
        regs.h.dl = 0;
        int86(0x10, &regs, &regs) ;
        return 0;
    }
    cur_homeA()
    {
        regs.h.ah = 2;
        regs.h.bh = 0;
        regs.h.dh = 2;
        regs.h.dl = 0;
        int86(0x10, &regs, &regs) ;
        return 0;
    }
    cur_homeB()
    {
        regs.h.ah = 2;
        regs.h.bh = 0;
        regs.h.dh = 3;
        regs.h.dl = 66;
        int86(0x10, &regs, &regs) ;
        return 0;
    }
}
```

Chapter 6: Cash Drawer Interface

Software Drivers

Peripheral drivers can be downloaded from the NCR website

(<http://www.ncr.com>)

1. At this site, select **Support**.
2. Under Related Items, Services; select **Drivers and Patches**.
3. Select **Retail Support Files**.
4. Select **Retail Platform Software**.
5. Select **Terminals** → **7446** → [**Model**] → [**Platform**] → [**OS**].
6. At this screen download the *OPOS_Cash_Drawer.ZIP* file. Install the software on the 7446 as a PC.

Cash Drawer Pin Assignment

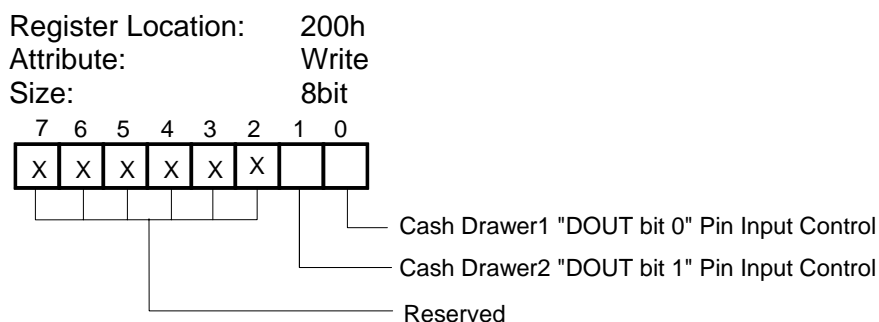
Pin	Signal
1	GND
2	DOUT bit0
3	DIN bit0
4	12V/24V
5	DOUT bit1
6	GND

Cash Drawer Controller register description

The Cash Drawer Controller uses two I/O addresses to control the Cash Drawer.

- Cash Drawer Control Register
- Cash Drawer Status Register.

Cash Drawer Control Register



21924a

Bit 7-2: Reserved

Bit 1: Cash Drawer "DOOUT bit1" pin output control.

= 1: Open the Cash Drawer2

= 0: Allow closing the Cash Drawer2

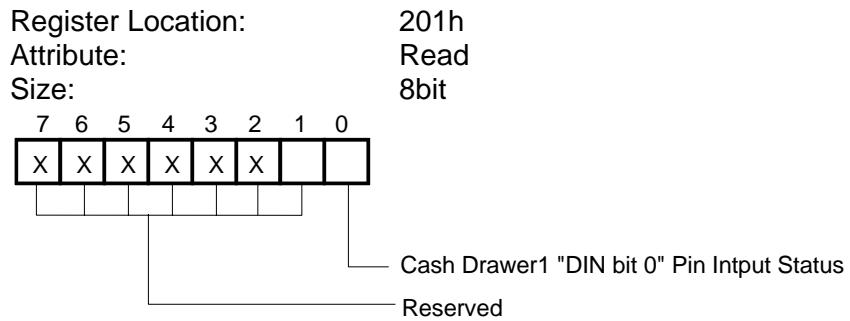
Bit 0: Cash Drawer "DOOUT bit0" pin output control.

= 1: Open the Cash Drawer1

= 0: Allow closing the Cash Drawer1

Note: Please follow the Cash Drawer control signal design to control the Cash Drawer.

Cash Drawer Status Register



21925a

Bit 7-1: Reserved

Bit 0: Cash Drawer "DIN bit0" pin input status.

= 1: Both Cash Drawers are closed or not present.

= 0: One or both Cash Drawers are open.

Cash Drawer control command example

Use the Debug.EXE program under DOS or Windows98.

Command	Cash Drawer
O 200 01	To Open
O 200 00	Allow to close
<ul style="list-style-type: none">• Set the I/O address 200h bit0 =1 to open the Cash Drawer by “DOUT bit0” pin control.• Set the I/O address 200h bit0 = 0 to allow you to close the Cash Drawer.	

Command	Cash Drawer
I 201	Check status
<ul style="list-style-type: none">• The I/O address 201h bit0 =1 indicates that both Cash Drawers are closed or not present.• The I/O address 201h bit0 =0 indicates that one or both Cash Drawers are open.	

Code Example

```
#include<dos.h>
#include<conio.h>

#define DigitalPort 0x200

char title[] =
"      First  Cash Box Testing Program  \n" ;
char line[] =
"      ===== \n" ;

void main()
{
    int PortStatus;

    while(1)
    {
        if((inportb(DigitalPort+1)&0x01)==0)
        {
            printf("\n\n\n\n\n");
            printf("\t\t\tCash box is OPEN status.");
            printf("\n\n");
            printf("\t\t\tPlease close cash box.");

            while((inportb(DigitalPort+1)&0x01)==0)
            ;
        }

        clrscr();      //clear screen

        printf("\n\n\n\n\n");
        printf(line);
        printf(title);
        printf(line);
        printf("\n\n\n\n\n\n\n\n");
        printf("\tPress any key to open the cash box (ESC to
quit)");

        if(getch()==27)
            break;

        clrscr();
    }
}
```

```
    do
    {
        outportb(DigitalPort,0x01);    //Control Pin=1

        delay(300);                    // Delay Time

        outportb(DigitalPort,0x00);    //Control Pin=0

        PortStatus=inportb(DigitalPort+1);
        PortStatus=PortStatus&0x01;    //Read Cash Box Status
        if(PortStatus==1)
        delay(2000);
    }
    while(PortStatus==1);
    }
}
```

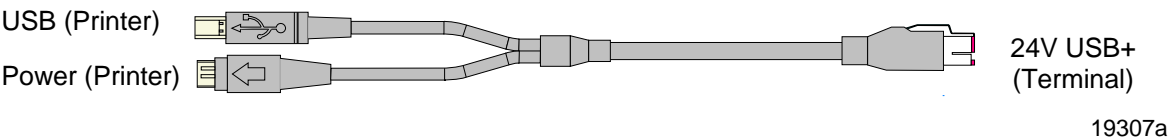
Appendix A: Cables

Printer Cables

Powered USB

497-0441177 - 1 m
(1432-C088-0010)

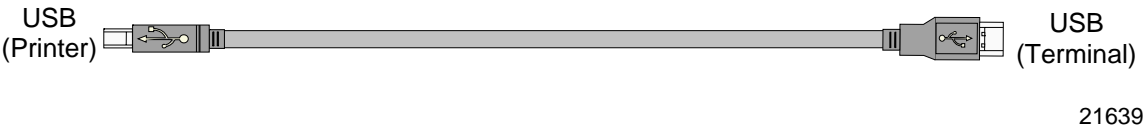
497-0441178 - 4 m
(1432-C088-0040)



Standard USB

497-0441898 - 1m
14323-C083-0010

497-0441899 - 4m
1432-C083-0040



Powered USB (Power Only)

497-0441156 - 1m
(1432-C092-0010)

497-0441157 - 4 m
(1432-C092-0040)

Power
(Printer)



24V USB+
(Terminal)

19721a

RS-232 (7167/7197, 9-Pin to 9-Pin)

497-0408349 - 0.7 m
(1416-C359-0007)

497-0407943 - 4 m
(1416-C266-0040)

9-pin
D-shell
Receptacle

9-pin
D-shell
Receptacle

RS-232
(Printer)



RS-232
(Terminal)

19722a

Printer Power Cable (24V)

497-0435073 - 2m
1416-C984-0020

Power
(Printer)



24V
(Terminal)

21638a

RS-232 (7162, 9-Pin to 25-Pin)

497-0407427 - 1.0 m
(1416-C337-0010)

497-0407429 - 4 m
(1416-C337-0040)

9-pin
D-shell
Receptacle

25-pin
D-shell
Plug

RS-232
(Terminal)

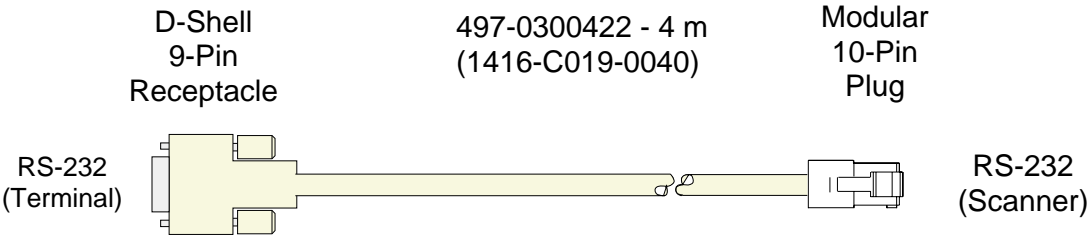


RS-232
(Printer)

20127b

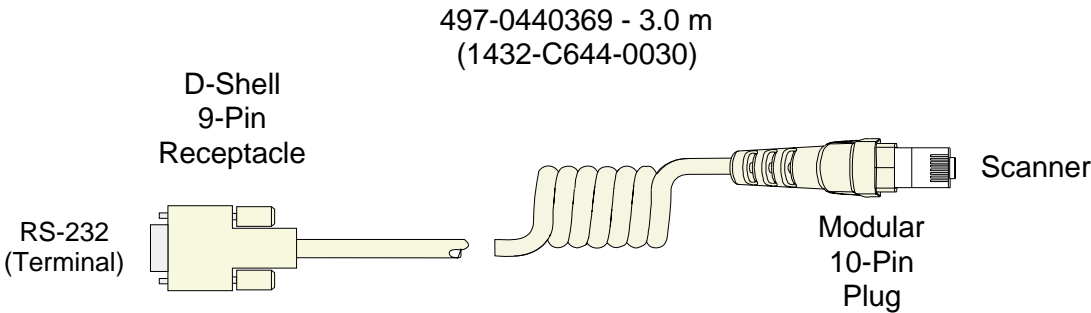
Scanner Cables

RS-232 (7872/7875 Scanner/Scale)



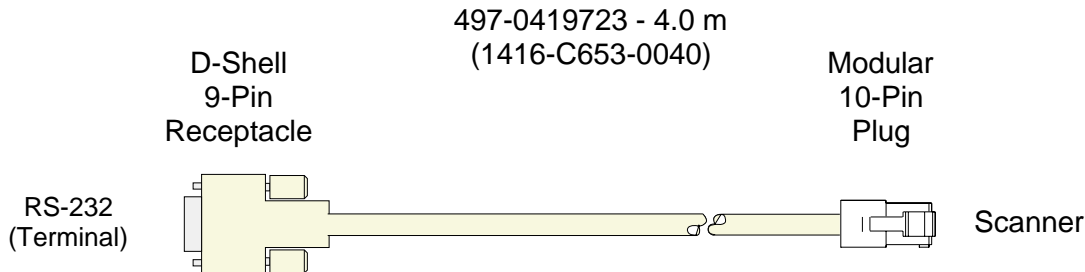
15479a

Powered RS-232 (7892 Scanner)



19729a

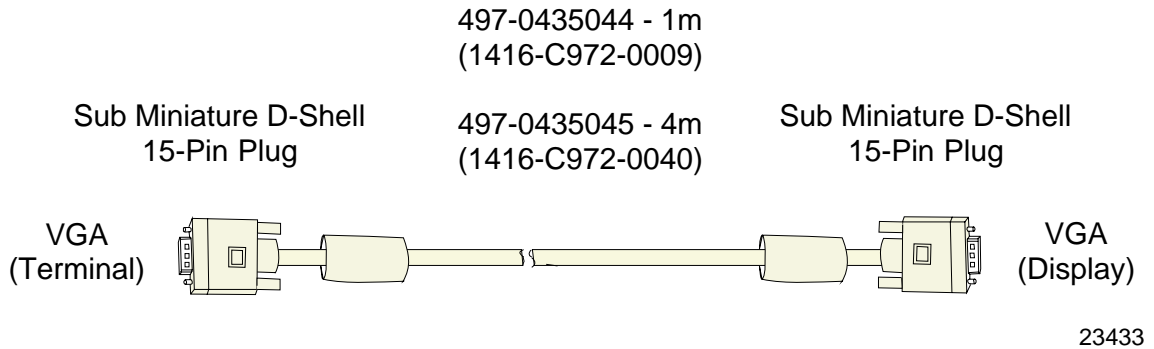
Powered RS-232 (7882 Scanner)



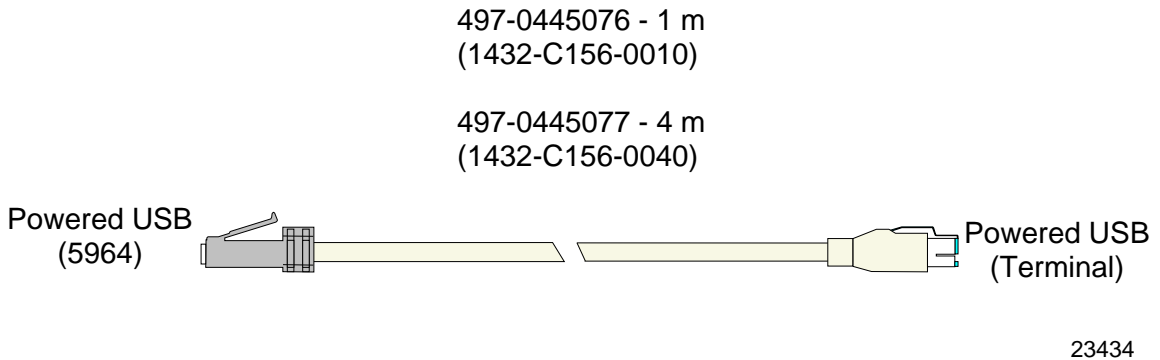
19728a

Display Cables

VGA (5964)



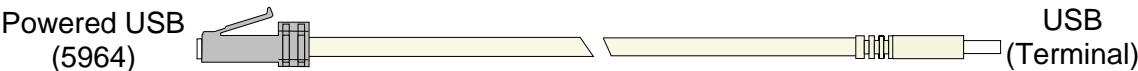
USB +Power (5964)



USB (5964)

497-0445078 - 1 m
(1432-C158-0010)

497-0445079 - 4 m
(1432-C158-0040)

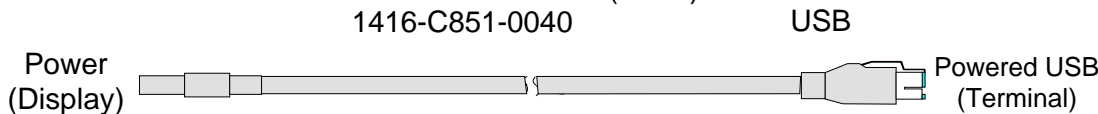


23531

Powered USB (5942 Power Cable)

497-0426160 - 4 m (White)
1416-C803-0040

497-0428512 - 4 m (Black)
1416-C851-0040



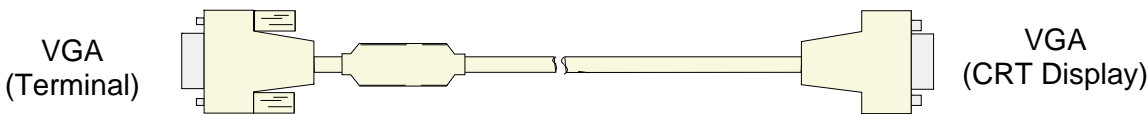
20444

VGA Extension (5942 12.1 Inch LCD)

Sub Miniature D-Shell
15-Pin
Plug

497-0009680 - 4 m
1416-C261-0040

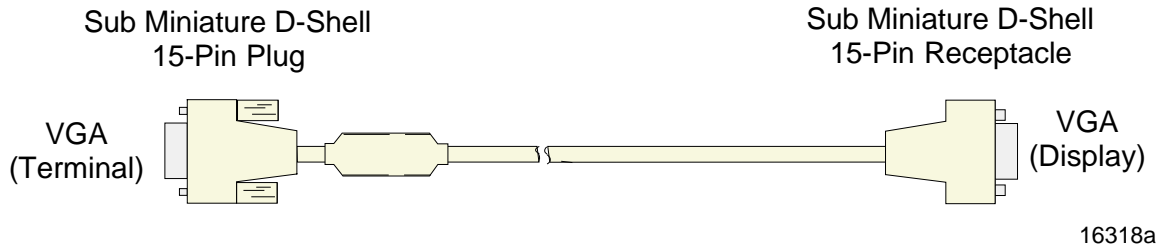
Sub Miniature D-Shell
15-Pin
Receptacle



21637a

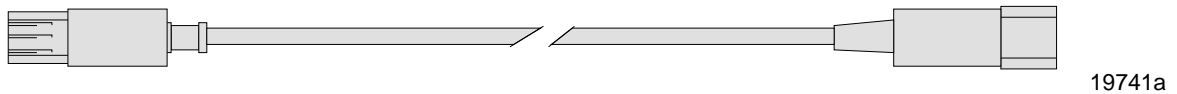
VGA Display, Remote Extension, Color

497-0009680 - 1m
(1432-C261-0040)

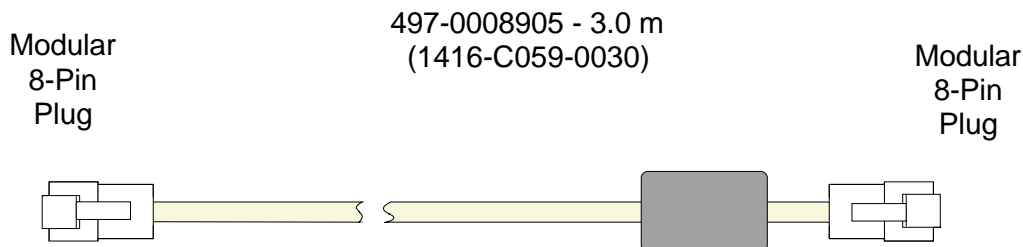


CRT AC Power Extension

497-0406237 - 4m
(1416-C508-0040)

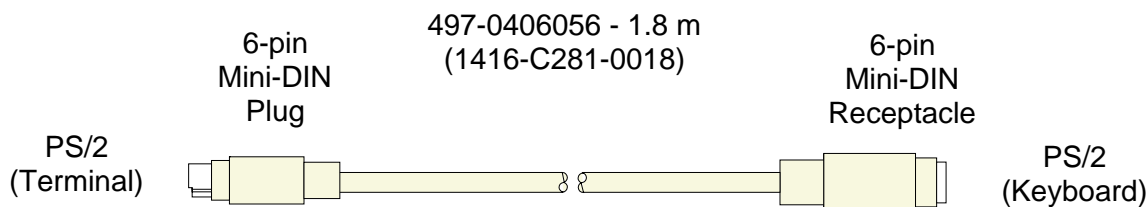


Ethernet, 10/100BaseT Cable



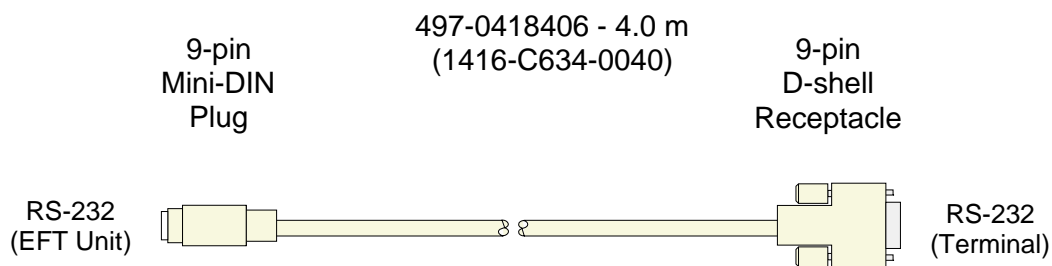
16298a

PS/2 Keyboard Extension Cable



15403a

RS-232 w/Power (5945/5992 EPT)

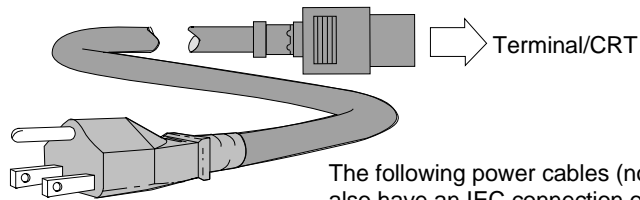


19723a

Power Cables

AC Power

1416-C325-0030 006-1009037 - U.S.



The following power cables (not shown)
also have an IEC connection of 45 mm:

1416-C320-0030 006-8601011 - SEV

1416-C321-0030 006-8601012 - U.K.

1416-C322-0030 006-8601019 - Australia

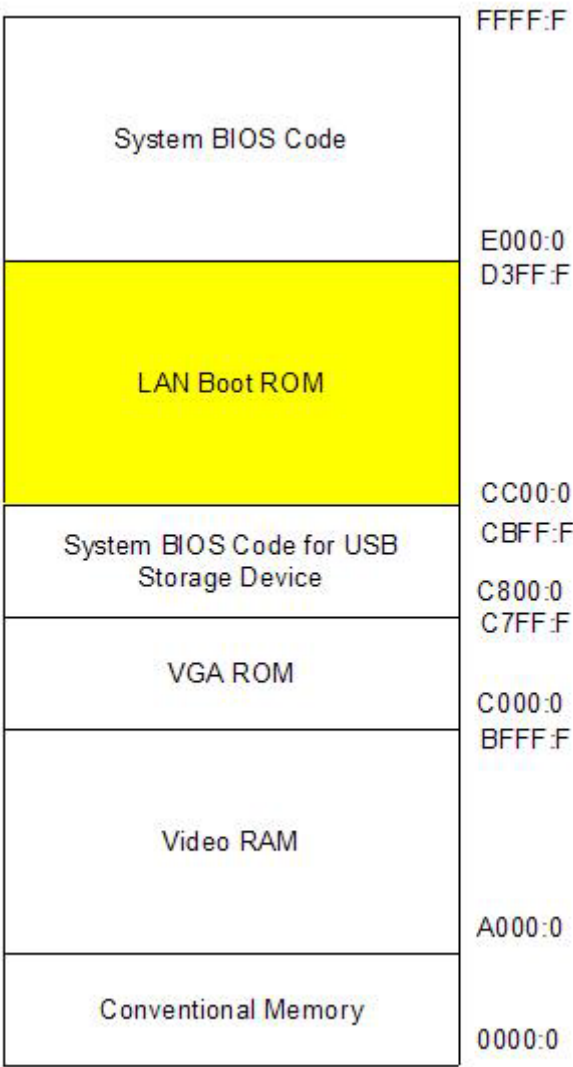
1416-C323-0030 006-8601010 - International

1416-C391-0030 006-8605488 - China

1416-C393-0030 006-8601001 - Japan Twist-Lock

15405a

Appendix B: Memory Maps



This memory map is based on the BIOS Load Optimized Defaults and does not have any add-on cards.

With the 2.1.3.3 BIOS the memory used for the DMI strings starts at a different location if the Legacy USB is enabled in the BIOS Setup. With Legacy USB enabled, the DMI strings start at D800:0. If Legacy USB is disabled, then the DMI strings start at DC00:0.