NCR RealPOS™ 30 (7446)

Release 1.0

User Guide

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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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Revision Record

Issue	Date	Remarks
A	Mar 2004	First issue

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

The NCR RealPOS™ 30 (also known as NCR 7446) is a powerful, retail-hardened point-of-sale terminal targeted for general merchandise, food and convenience store environments. It provides exceptional scalability utilizing 1.2GHz Intel Celeron processor to address a range of price/performance levels and operating system environments.

The system offers superior connectivity for retail, with support for legacy peripheral interfaces (RS- 232, PS/2, Parallel, and VGA), as well as emerging interface standards such as USB 1.1 ports.

The optimized cabinet configurations save valuable space at the Checkstand while providing expandability for future needs.

The system includes 1 PCI slot, 2 DIMM memory sockets supporting up to 512 MB of PC133 SDRAM. There are provisions for internal Flex Disk Drive and Compact Flash Memory devices.

The RealPOS 30 supports a broad range of industry standard operating system environments including DOS and Windows XP Embedded. In addition, the RealPOS 30 is Linux certified utilizing various Linux distributions.

Note: Windows 2000 Professional and Linux reference images are also available by special request. You may order NCR drivers on CD-ROM, but they must be loaded or configured by the customer.

Configuration

Modular Configuration

The RealPOS 30 is the smallest terminal cabinet in the RealPOS family. Integration options are limited to the 7446-K300 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.

21471

Operator Controls

Access Door Lock

Power ON LED   Disk Activity LED   USB

21580

Power On/Off switch   USB   Fiex Disk Drive   Compact Flash Slot   Access Door

21579
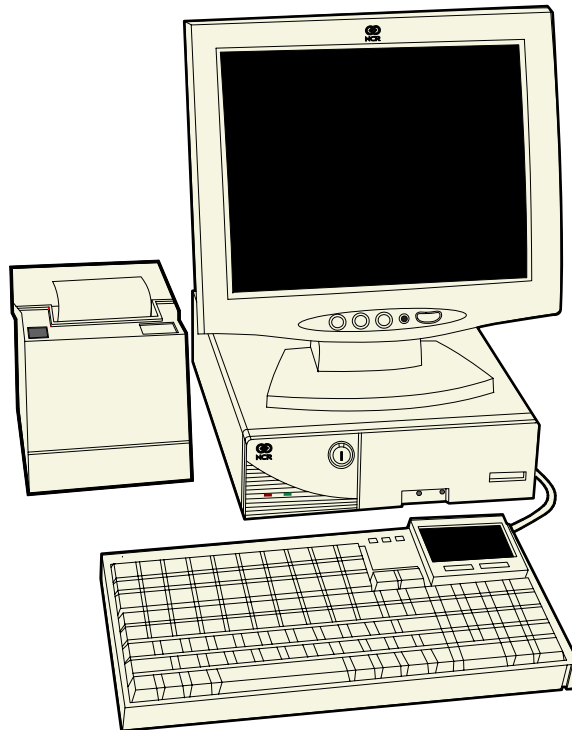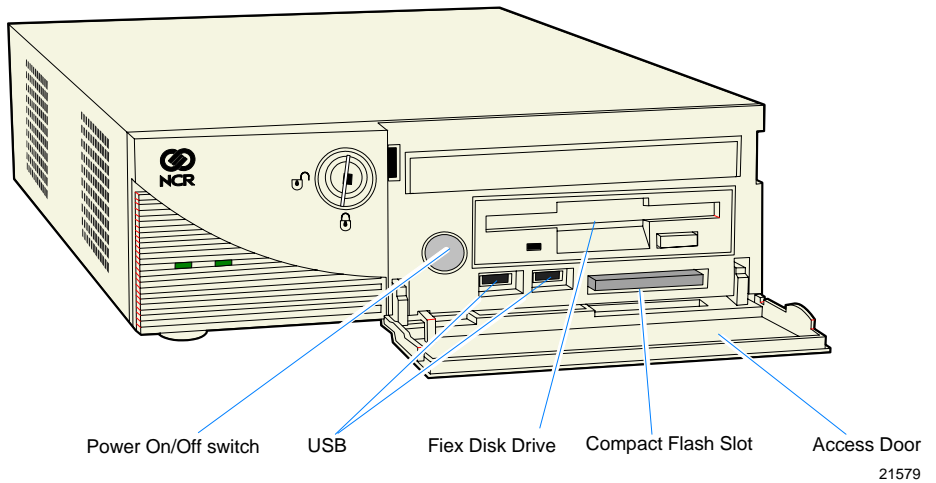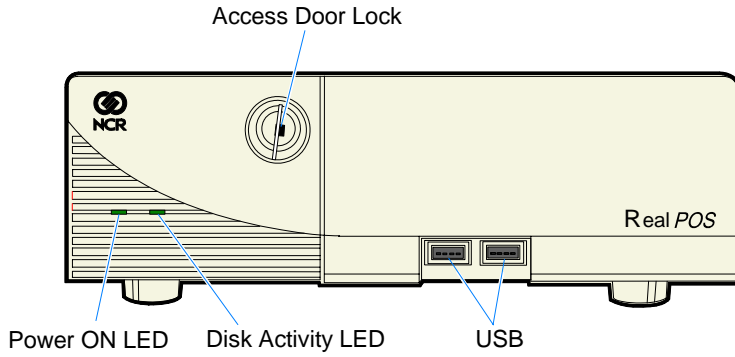
Serial Number/Model Number Label

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.
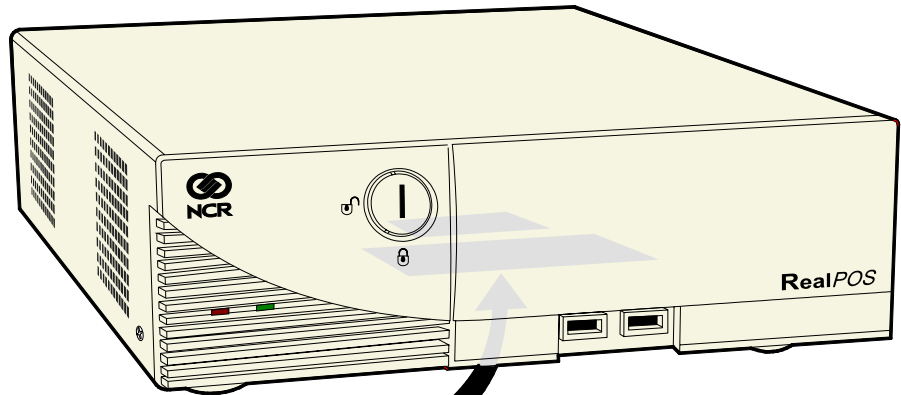
Note: Place Label On Bottom Of Unit
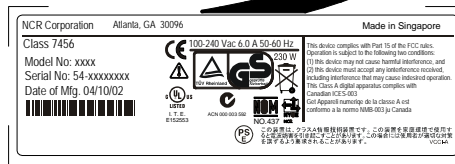
21582

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

Processor Board

The processor board has the following features:

- 1.2GHz Intel Celeron processor with 100MHz front side bus
- Two 168-Pin DIMM memory sockets (up to 512 MB of PC133 SDRAM)
- One Combo PCI Riser Slot for Optional Expansion Card
- Four External RS-232 ports (selectable)
- 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
- Up to 32MB Shared Video Memory—Unified Memory Architecture (UMA)
- Two Fan connectors for CPU/System with FAN Control

- APM 1.2 or ACPI 1.0b
- 2Mbit LPC Firmware Hub for Award BIOS
- Real-Time Clock/Calendar 256-byte CMOS
- 2Mbit LPC Firmware Hub for Award BIOS

I/O POS Board

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

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
- 3.5-Inch Hard Disk Drive
- 64MB or 256MB Compact Flash (through IDE interface)

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

Note: A Linux reference image, including NCR drivers, is orderable on CD-ROM, but must be loaded or configured by customer. You may separately negotiate with NCR Worldwide Customer Services or NCR Professional Services for custom preloading services, including Windows XP Professional, Windows 2000 and Linux.

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

5942 12.1-Inch Color LCD
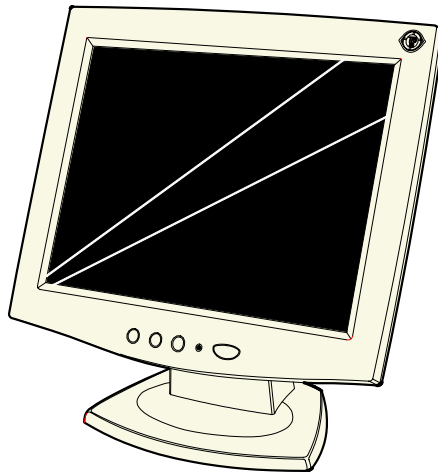
19809

The design of the 5942 12.1-Inch LCD is for customers who desire a color display and prefer the small footprint and ergonomic packaging of LCD technology versus traditional CRT's. The 5942 Display features a 12.1-Inch Active Matrix Color LCD with support for SVGA and XGA resolution.

Note: The RealPOS 30 supports the 5942 LCD Display as an operator display only.

Features
- Bright dual and single backlight active matrix LCDs
- VGA Interface
- Standalone Base
- 1.5m VGA Cable
- AC Power Supply with mini-IEC connector
- AC Power Cord

5982 5-Inch Monochrome LCD

The 5982 LCD Display is a terminal-powered monochrome 5-Inch VGA LCD. It is suitable for retail environments that do not require a significant amount of data displayed at one time, and/or require an operator display with a very small footprint. The display provides a 2x20 display format emulation with a 2x20 VCO driver to facilitate application and hardware migration. It supports off-the-shelf operating systems and applications, and can mount on the 5932 64-Key keyboard or standalone with an 8-inch Post Mount (5982-F034).
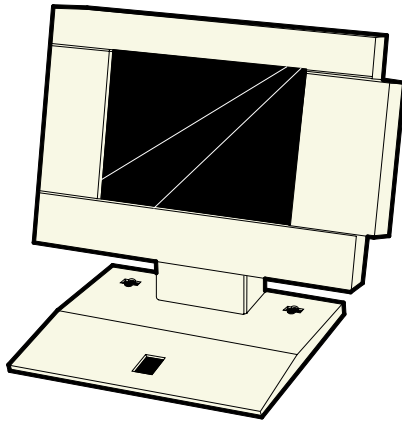
19744

Features
- Keyboard Mount
- 4m LCD Cable

Note: To configure a 5982 LCD Display with the RealPOS 30, a PCI LCD Card (5952-K052) is required.

CRT Displays

The RealPOS 30 supports traditional CRT/Keyboard configurations.

Note: The display's data cable connects to the analog VGA port at the back of the terminal. However, ensure a separate order for a 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.

7452-K404 9-Inch Monochrome CRT (Remote)
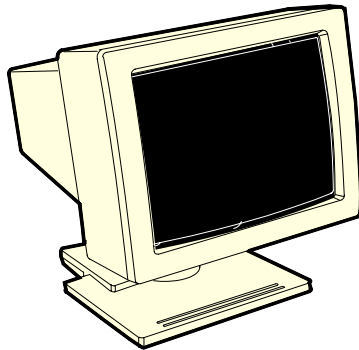
7452-K404   19742b

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

7452-K419 15-Inch Color CRT (Remote)
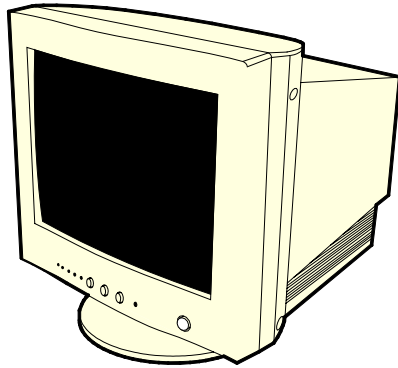
19743

Features

- Non-glare, phosphor screen with VGA (640x480) resolution
- Table top mount with tilt and swivel
- 1m Data (Video) Cable
- 1m 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.

There are four models of the NCR 5932 Keyboard:

- NCR PS/2 Alphanumeric Big Ticket POS Keyboard (5932-1xxx)
- NCR 64-Key PS/2 POS Keyboard
    - without Magnetic Stripe Reader (MSR) (5932-2xxx)
    - with MSR (5932-2xxx)
- NCR USB Alphanumeric Big Ticket Keyboard (5932-5xxx)
- NCR 5932 104-Key Programmable POS Keyboard (5932-6xxx)

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.
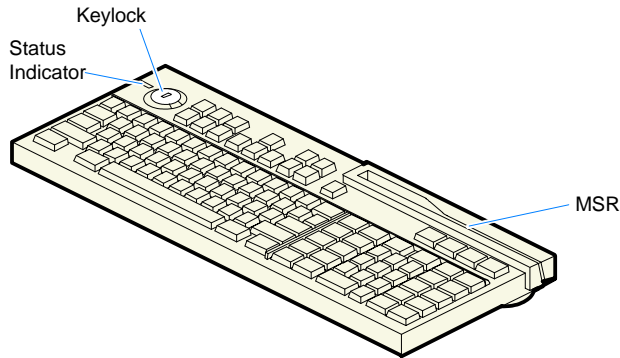
19745

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.
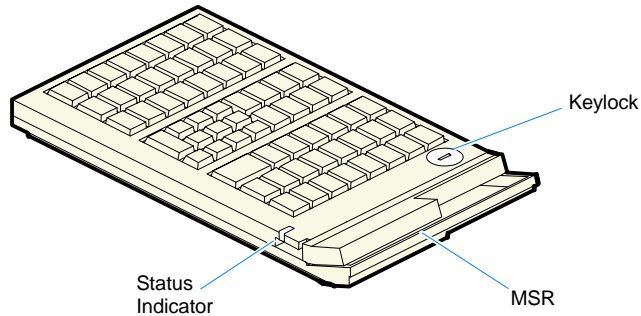
19746

Features

- Keylock
- Speaker
- Scanner
- System Status Indicator LED
- 68-Inch PS/2Keyboard 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 *PC Setup* mode
Off	System off (see *Keyboard Power* 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 USB Alphanumeric Big Ticket Keyboard (5932-5xxx)

Keylock

MSR
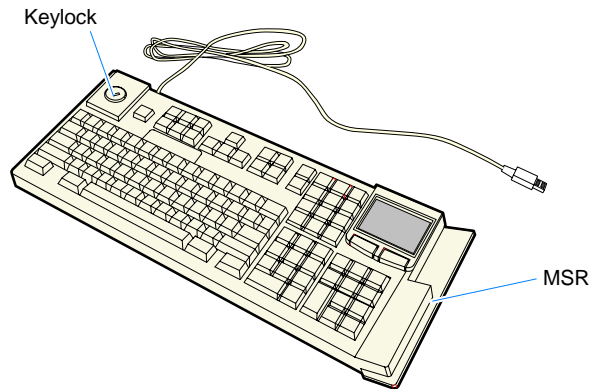
19586

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 104-Key Programmable POS Keyboard (5932-6xxx)

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
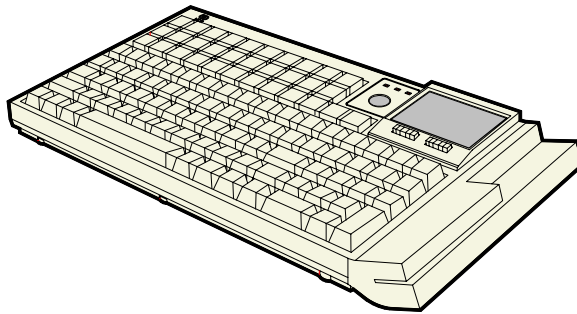
21662

The keyboard includes the following features:

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

Customer Displays

7446-K451 VFD

The 7446-K451 can be integrated on the RealPOS 30 when combined with the 7446-K300 Rear Cable Cover Kit.
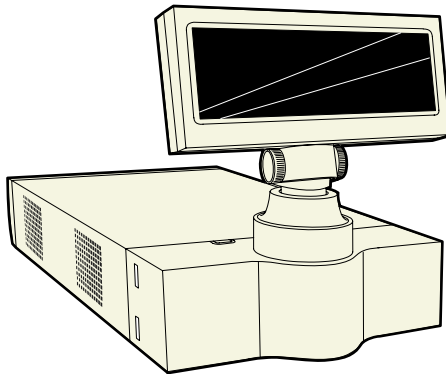
21679a

Optionally, the 7446-K451 can be combined with the 7446-K452 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.).
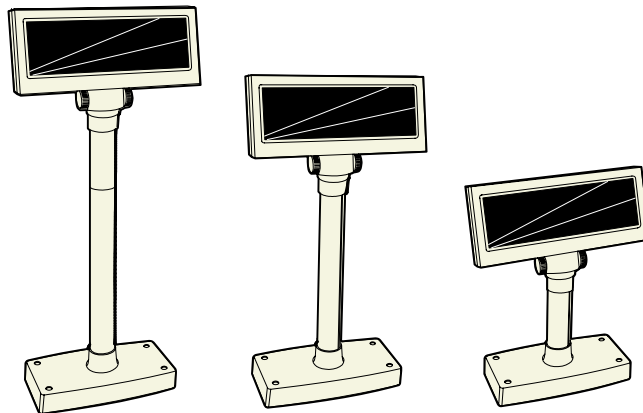
21677

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

5972-1xxx VFD

The NCR 5972-1xxx Display is a 2x20 alphanumeric VFD display. It requires selection of cable feature, power feature and remote mount feature to configure with the RealPOS 30.
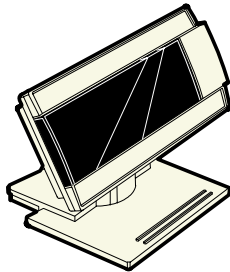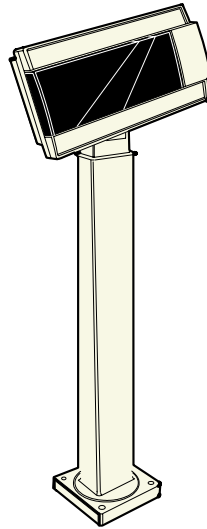
Desktop Model   16-Inch Post   20448

Features

- RS-232 Interface
- Socket for 32K of PROM for additional character sets
- 7 x 9 pixel characters
- Diagnostics
- Character sets:
    - Code Page 858 (International)
    - Katakana
    - Code Page 866 (Cyrillic)
- Terminal Powered or external power supply

5972-2xxx LCD

The NCR 5972-2xxx is a low cost alphanumeric 2x20 LCD Display. It requires a selection of remote mount feature to configure with the RealPOS 30.
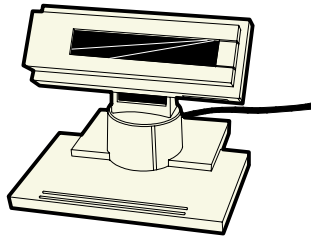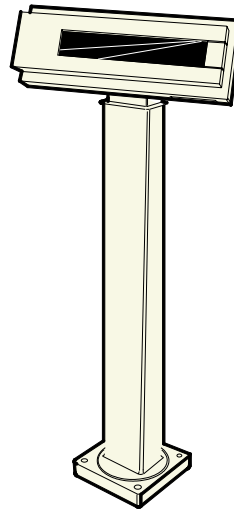
5972-2xxx (LCD)   5972-2xxx (LCD)

19750c

Features
- RS-232 Interface
- 5 x 8 pixel characters
- Diagnostics
- Character sets:
  - Code Page 858 (International)
- Terminal Powered or external power supply

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.
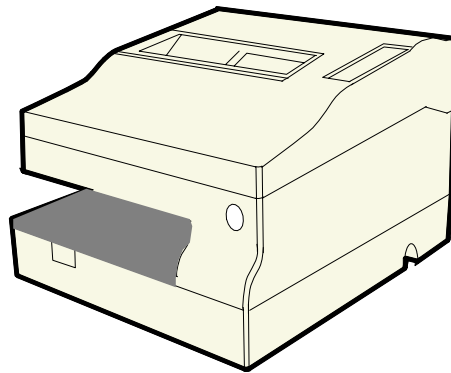
15220

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..
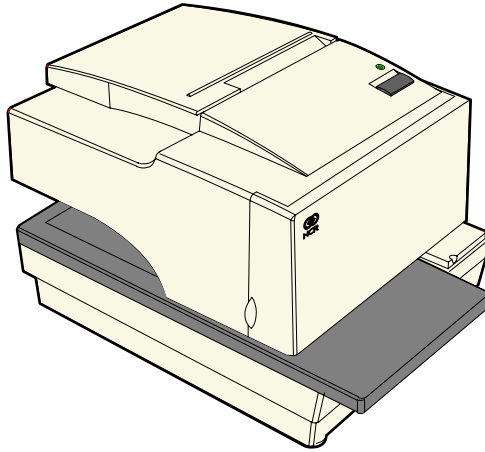
19711

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

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.
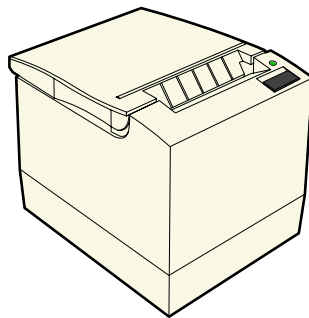
19712

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

System Configuration Diagram

7892 7882 7837 5972 or 7446-K451 CRT-K4xx

5942

5932-5xxx
Big Ticket USB

5982

7167 7197 7162

PCI LCD Card *USB* RS-232) USB VGA

USB

RS-232

RS-232

I/O POS
Board

7446 Motherboard

USB

24V Power

Cash
Drawer

Parallel

Audio Jack

2182/2183/2189

5932-6xxx
Compact PS/2 5932-1xxx
Big Ticket 5932-2xxx
64-Key

PS/2

RS-232 PS/2

Mouse

5972-2500 5972-1200 7875 7197 7167 7162 5972 or 744x-K542

21607
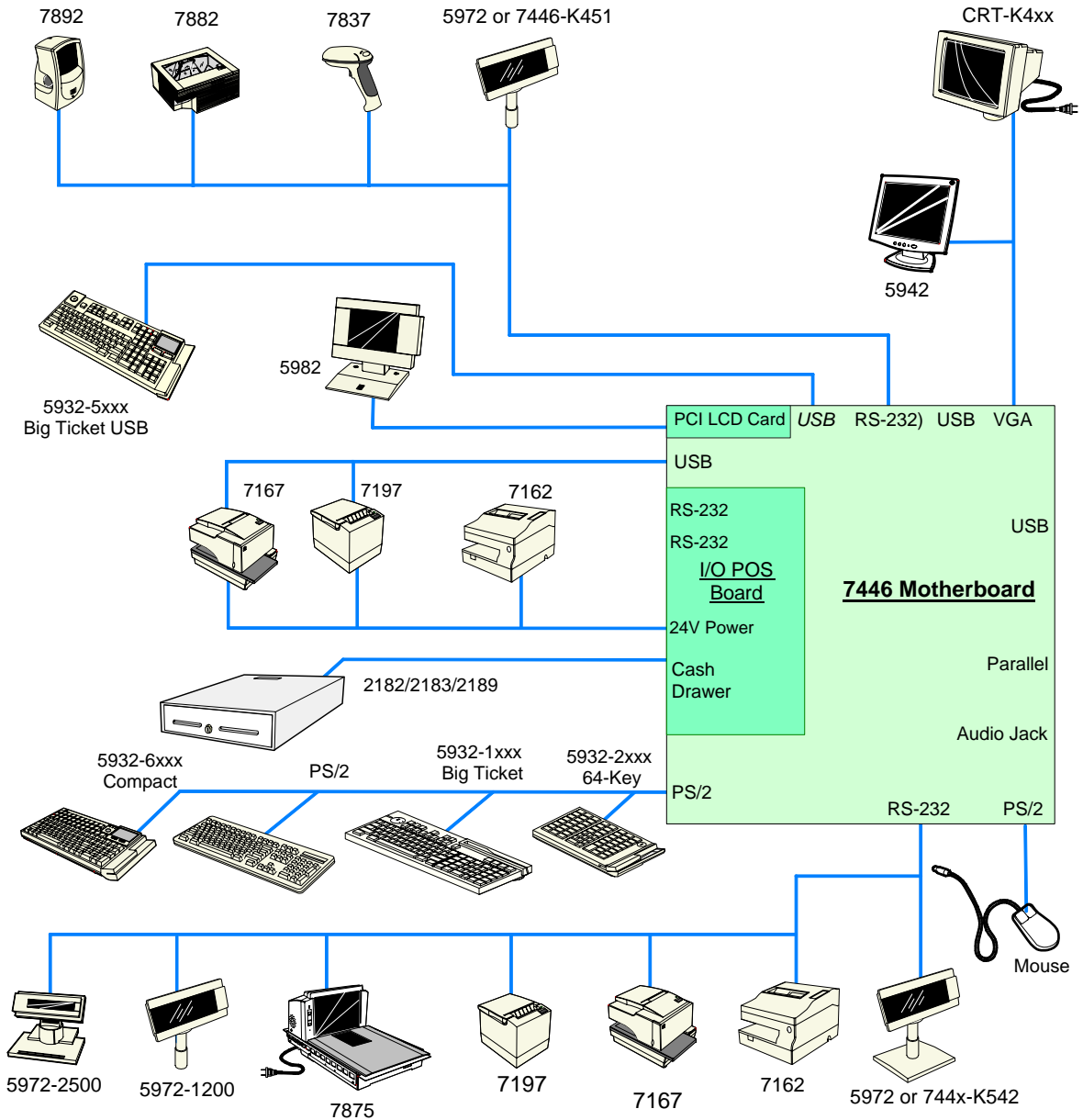
Wireless Network

The 7446 supports the ORiNOCO 802.11b Gold PCI Adapter (2330-K354) wireless network component. This wireless LAN PCI expansion card features Gold 128-bit encryption and *worldwide* certification.

Note: Maintenance is not offered for the 2330-K354 due to rapid product refresh cycles in the wireless industry.

Introduction to Using Access Points

An Access Point extends the capability of an existing Ethernet network to devices on a wireless network. Wireless devices can connect to a single Access Point, or they can move between multiple Access Points located within the same vicinity. As wireless clients move from one coverage cell to another, they maintain network connectivity.
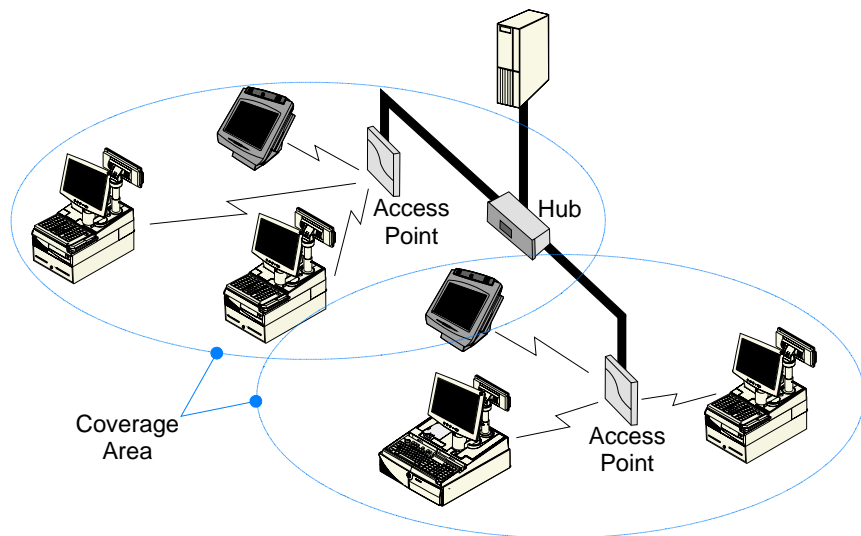
Wireless Network Access Infrastructure

To determine the best location for an Access Point, it is best that you conduct a Site Survey before placing the device in its final location. For information about how to conduct a Site Survey, contact your local NCR support representative.

Before configuring an Access Point for your specific networking requirements, ensure initialization. See the *ORiNOCO AP-2000 User Guide (2330-K309)* details. This document is available on the NCR Information Products web site at http://www.info.ncr.com. Click on *General Search* and then enter *Proxim* in the Title field.

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.
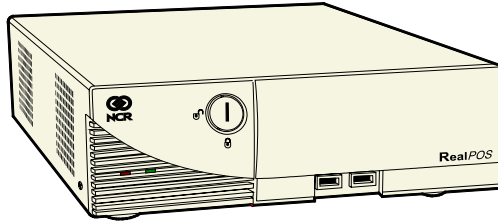
21240

2. Connect the external cables. The following illustration identifies the Back Panel and Front Panel cable connectors (I/O POS Board is shown).
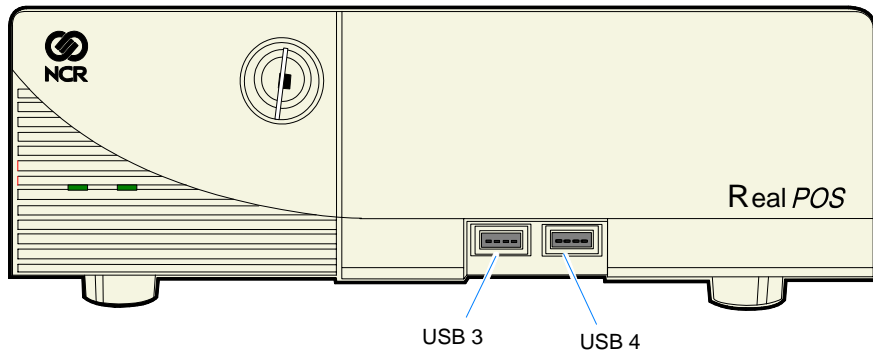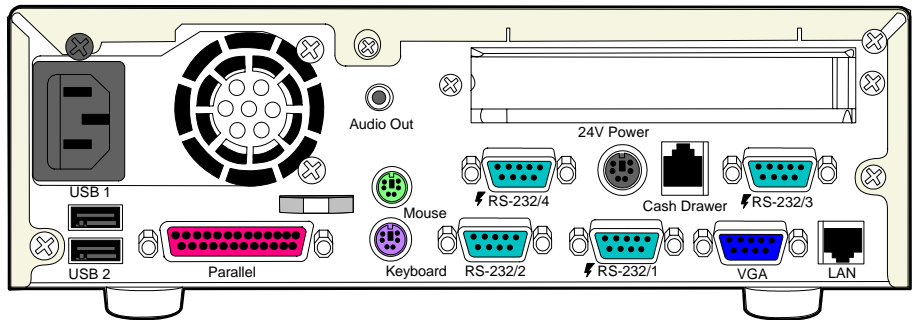
21581

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.

21583
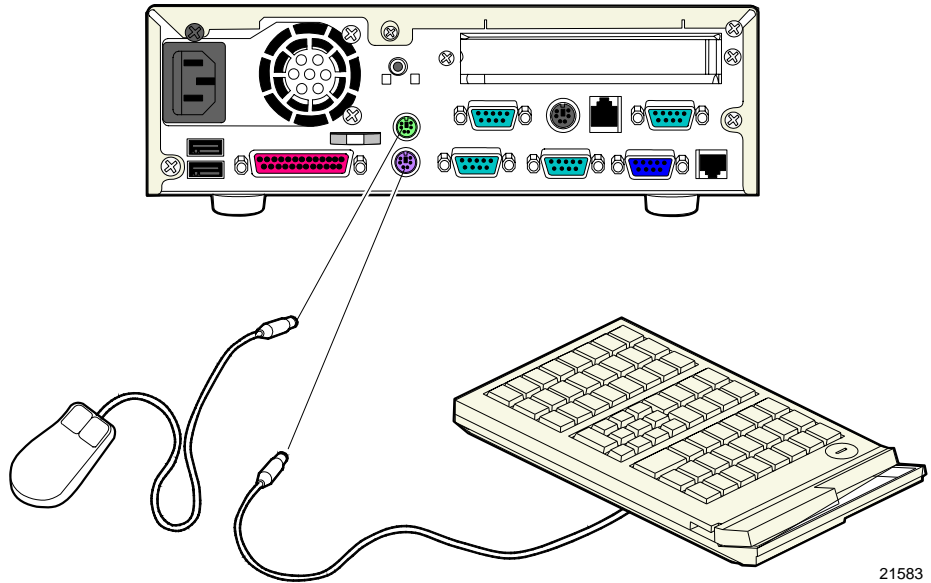
Installing the Transaction Printer

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	√	√
7197	√	√

1. Connect the Data Connector Cable (USB or RS232) on the printer to the corresponding terminal port.

2. Connect the Printer Power Cable to the *Power Connector* on the printer and to the *24V Power Connector* on the terminal.

497-0435073 - 2 m
(1416-C984-0020)

Power

RS-232

9-Pin to 25-Pin (7162)
497-0407427 - 1.0 m
(1416-C337-0010)

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

9-Pin to 9-Pin
497-0408349 - 0.7 m
(1416-C359-0007)

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

21584

USB   Power

497-0418587 - 1 m
(1416-C640-0010)

497-0435073 - 2 m
(1416-C984-0020)

497-0418588 - 4 m
(1416-C640-0040)

21585
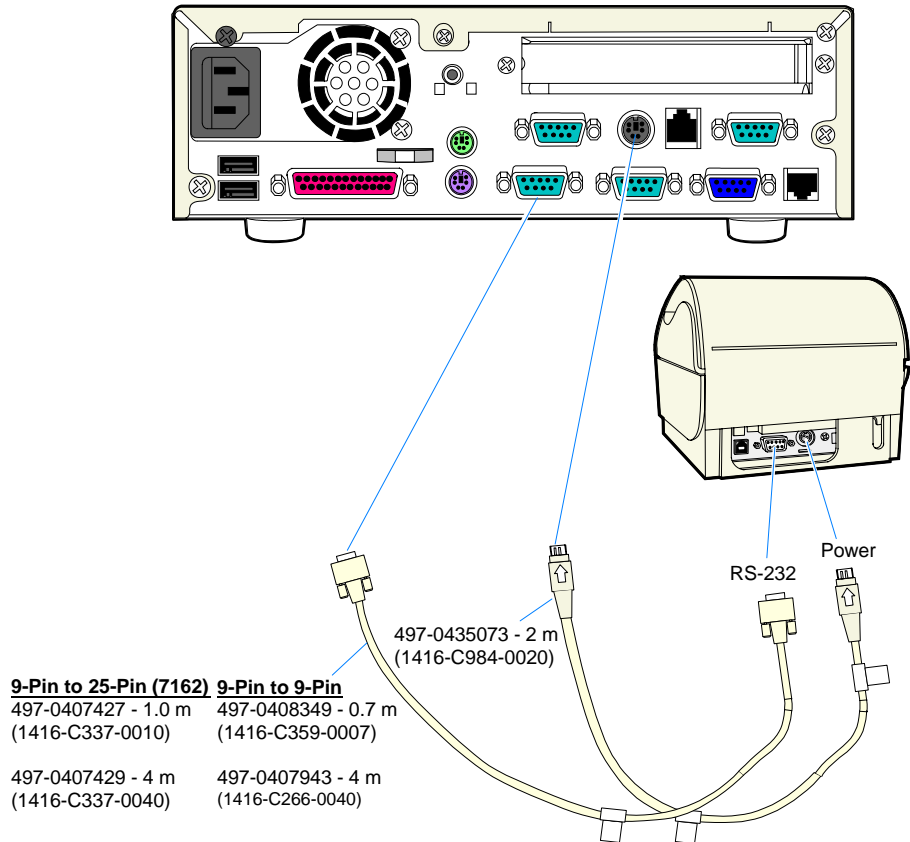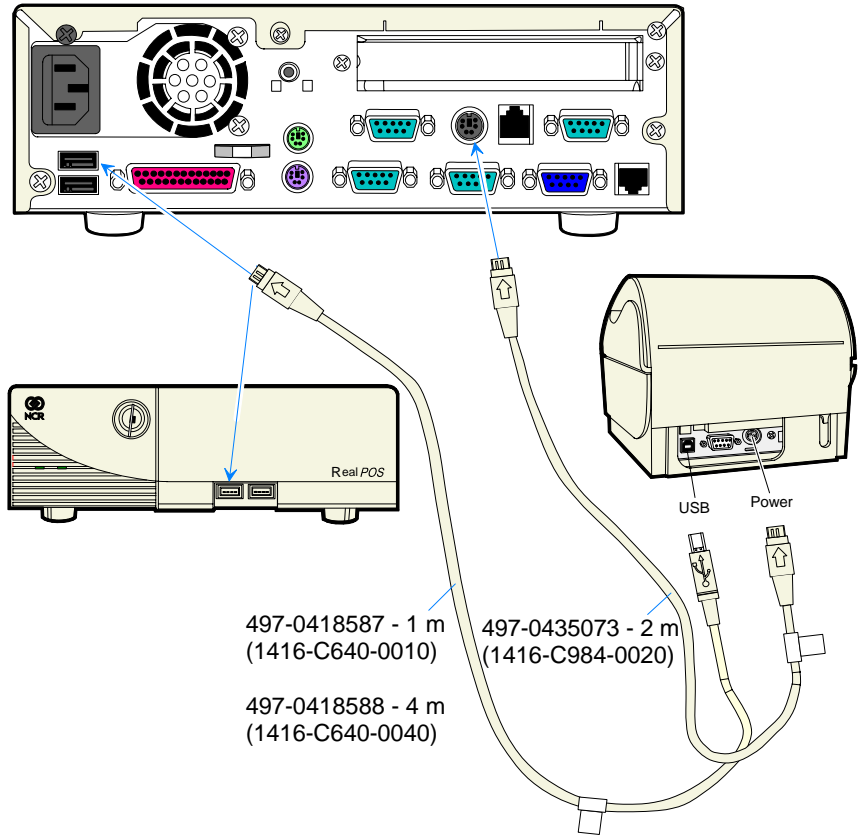
Installing the Operator Display

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 5942 LCD Monitor
- NCR 5982 5-Inch Mono LCD
- NCR 7452-K404 9-Inch CRT (Remote)
- NCR 7452-K419 15-Inch Color CRT (Remote)

5942 LCD Monitor

The 5942 connects to the terminal through the VGA connector. It receives power from an AC power supply.

VGA

Power

VGA
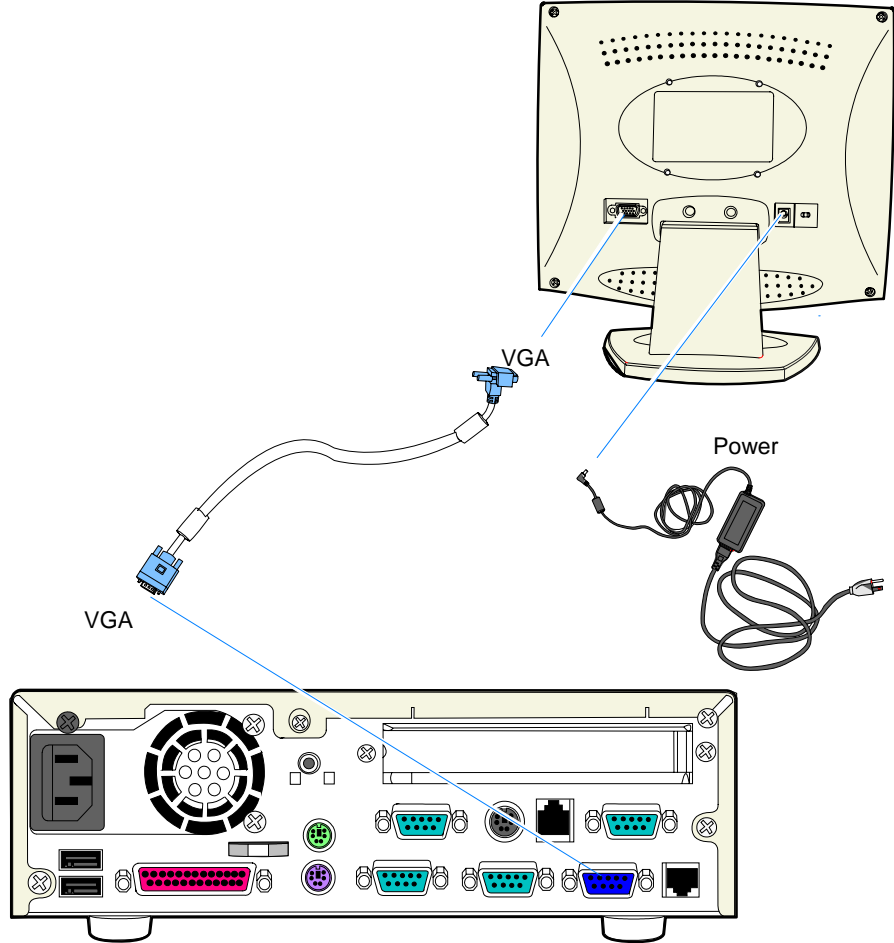
21586

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 adapter cable (1416-C508-0040).

5982 5-Inch Operator Display

The 5982 5-Inch Operator Display is a 640 x 480 LCD with a backlight (not adjustable), contrast control knob, and keyboard mount.
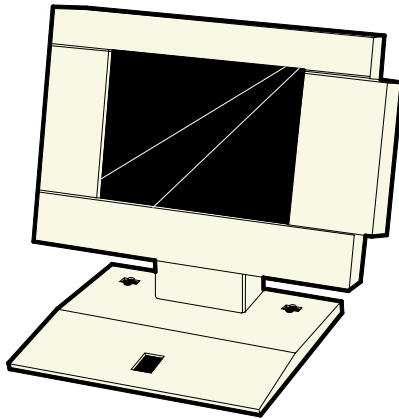
19744

Note: Before the 5982 Display is connected, the PCI LCD board must be installed in the terminal.

Installing the PCI LCD Card (5952-K052)

1. Power the system OFF.

2. Set SW1 to select Panel 4 (see chart below).

Panel Select Switch (SW1)

Keyboard Header Connector (for optional internal harness)

Power Harness Connector

LCD Connector

PS/2 Keyboard Connector (Keyboard Adapter Cable)

VGA BIOS
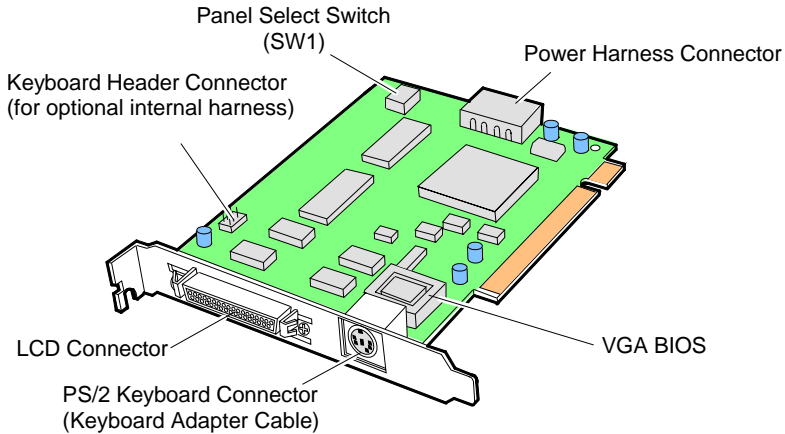
15376

P1	P2	P3	Function
OFF	OFF	OFF	Panel 8 (Color DSTN) (Default)
OFF	OFF	ON	Panel 7 (Mono STN)
OFF	ON	OFF	Panel 6 (Color TFT)
OFF	ON	ON	Panel 5 (Unused)
ON	OFF	OFF	Panel 4 (5-in. Mono)
ON	OFF	ON	Panel 3 (Unused)
ON	ON	OFF	Panel 2 (Unused)
ON	ON	ON	Panel 1 (Unused)

3. Install the PCI LCD Board into one of the PCI slots in the terminal.

   Caution: Use care so as not to damage the Speaker or Keyboard Header connectors on the Motherboard during card installation.

Connecting the 5982 Display to the Terminal

1. Unplug AC power.

2. Locate the Display Mount within 4 meters of the host terminal.

3. Connect the Display Cable to the PCI LCD.

PCI LCD
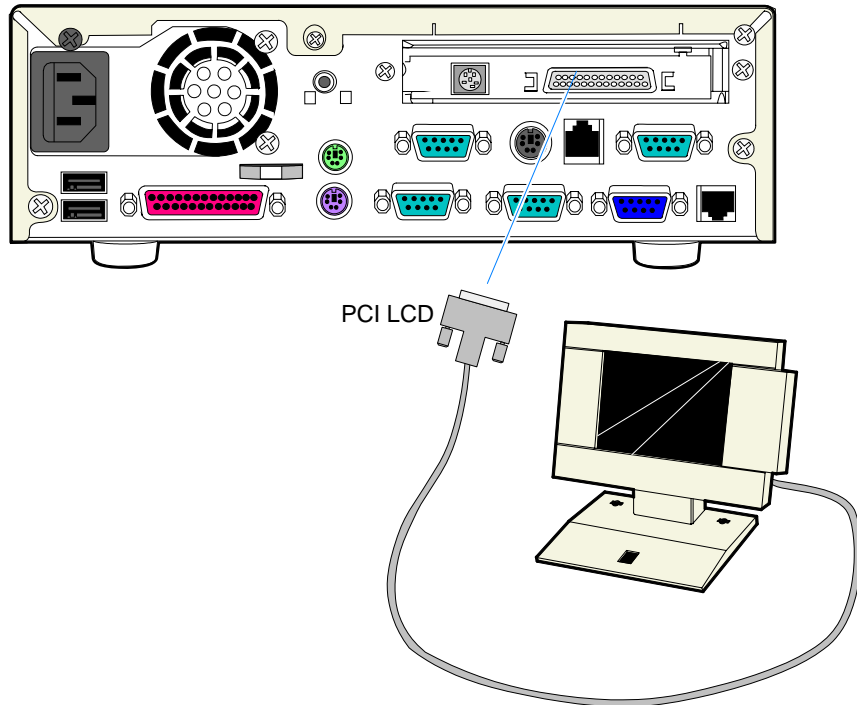
21587

For additional installation information, refer to the *NCR 5982 5-Inch LCD Operator Display User's Guide* (BD20-1443-A).

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).

Plug into an AC Outlet
(Using the country
specific cord)

Data
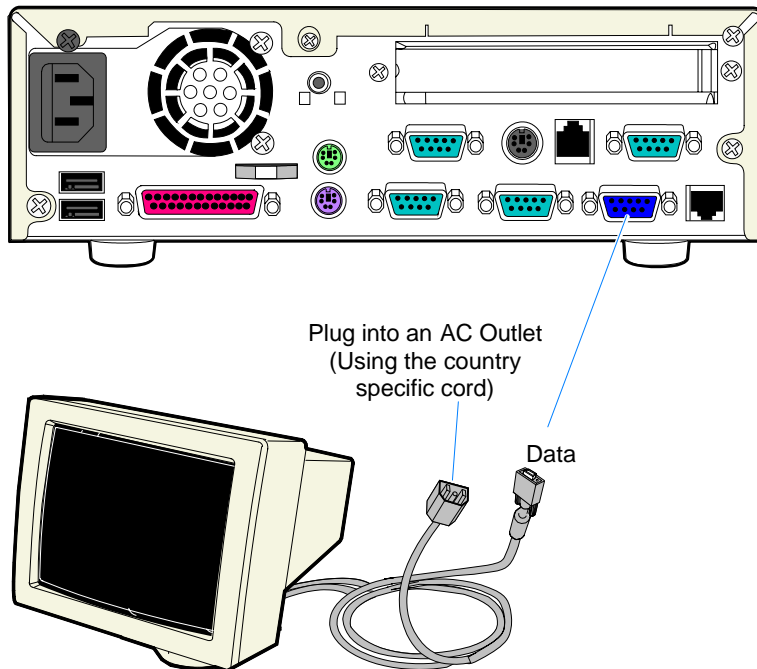
21590

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-K451 Customer Display Kit
- NCR 7446-K300 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

21466
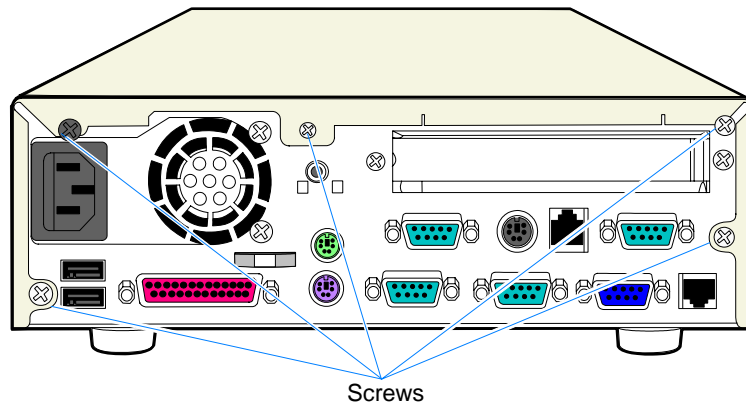
b. Install the Cable Cover Brackets using three of the longer
    screws that are supplied in the kit and the black screw removed
    earlier.

c. Install the remaining kit screw and plastic sleeve in the top
    center of the terminal.

Screw w/Plastice Sleeve

21466
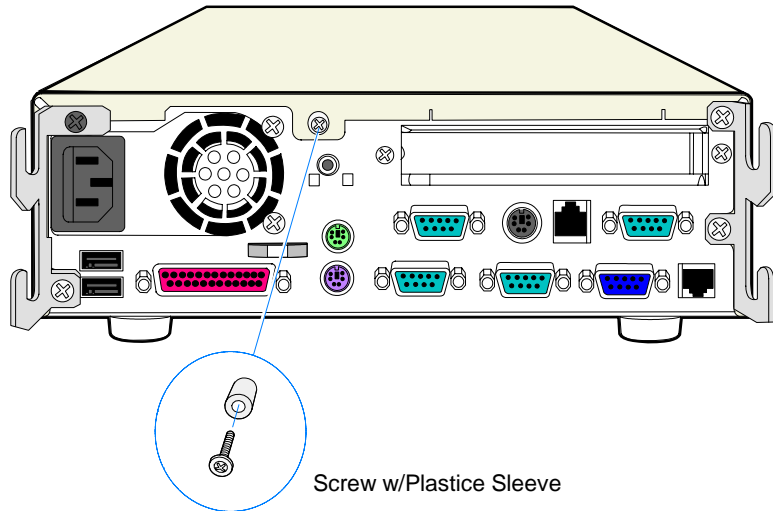
2. Remove the Display Post Insert and Screw Hole Fillers from the Cable Cover. These are easily pressed out.

Display Post Insert

Screw Hole Fillers (4)
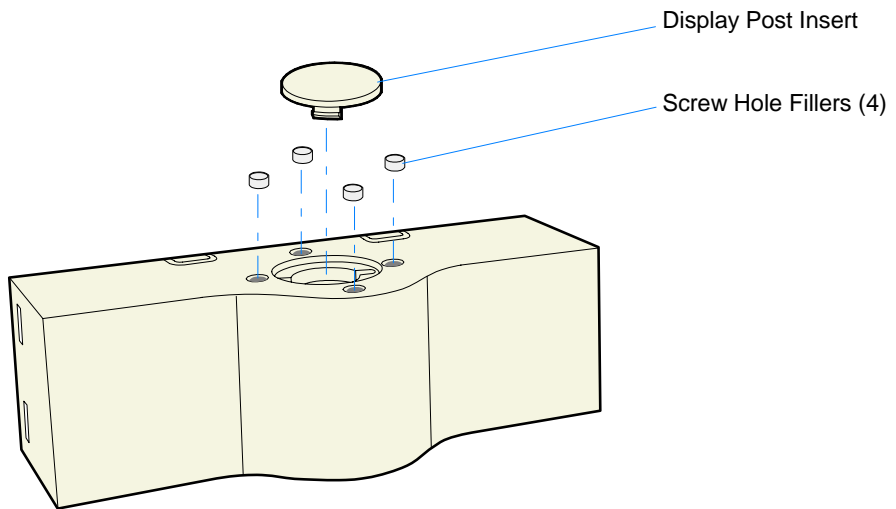
21664

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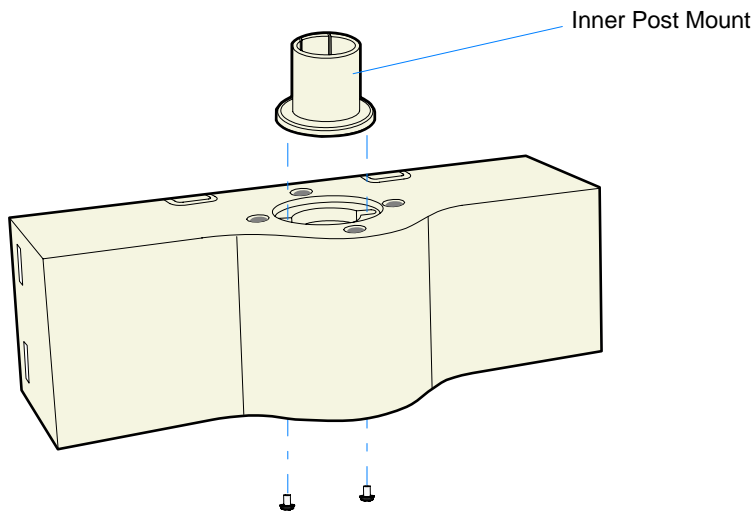
Inner Post Mount

21663

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

Outer Post Mount
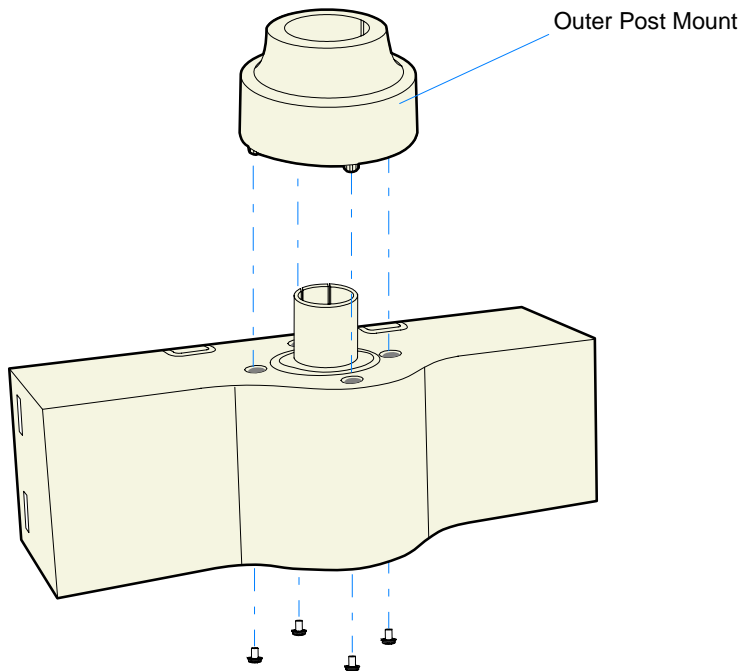
21644

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

Adapter Sleeve
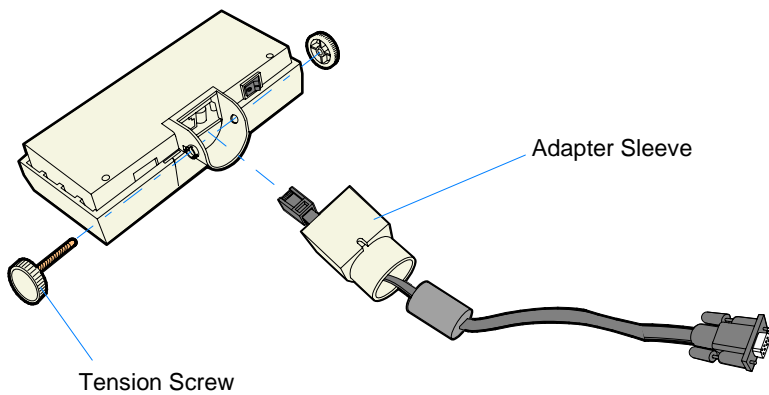
Tension Screw

21685

6.   Route the cable through the Cable Cover and Adapter Sleeve.
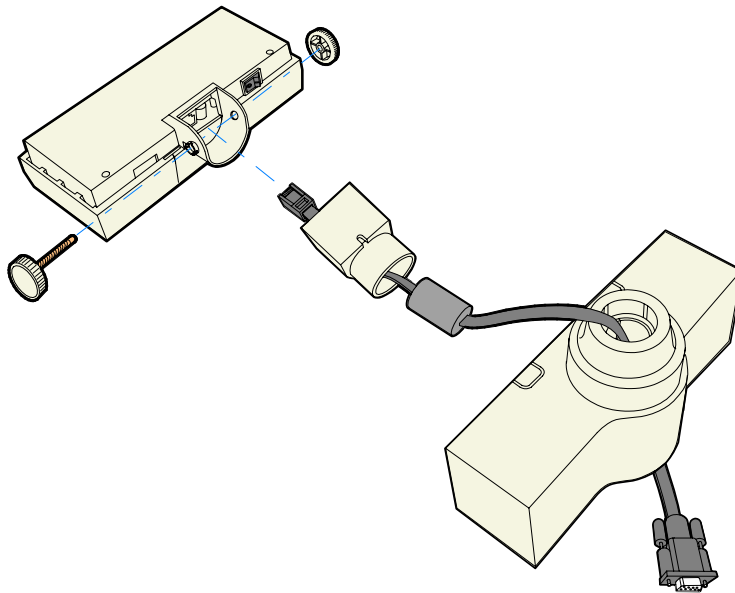
21666

7.   Connect the cable and install the Adapter Sleeve in the display, securing it with the Tension Screw.
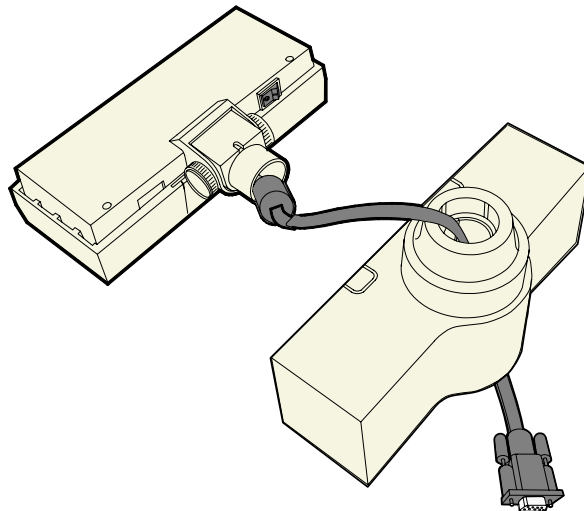
21667

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.
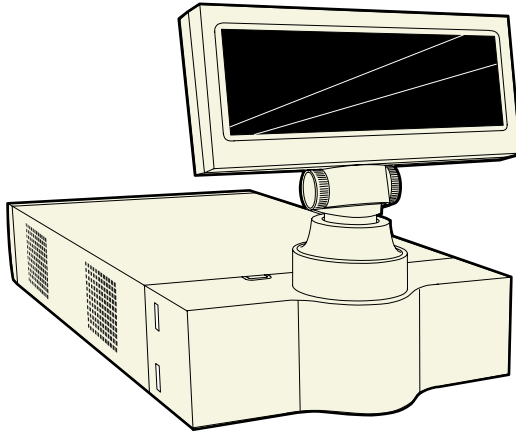
21679a

Installing a Remote NCR 7446-K451 Customer Display

This 7446-K451 Customer Display has various post lengths, which permit different viewing heights for the display..
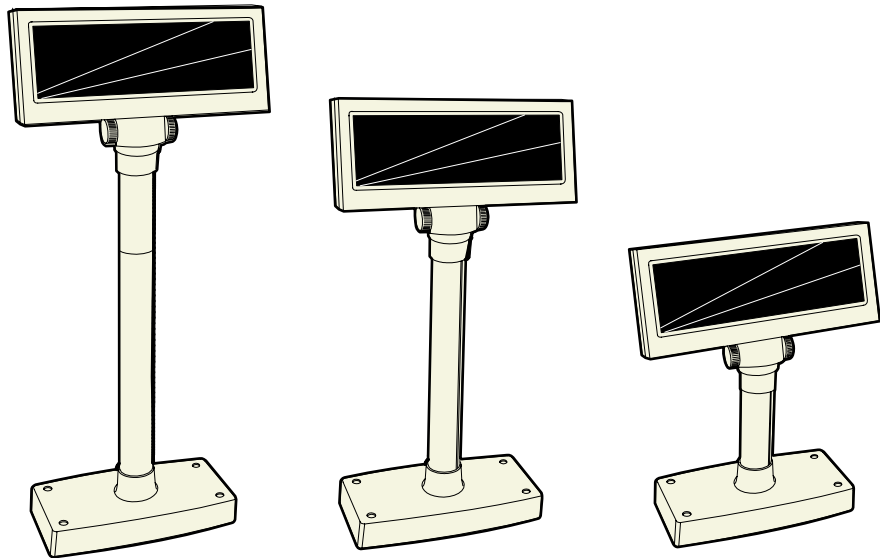
21677

Installation Procedure

The Integrated Customer Display consists of two kits:

- NCR 7446-K451 Customer Display Kit
- NCR 7446-K452 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.

21687
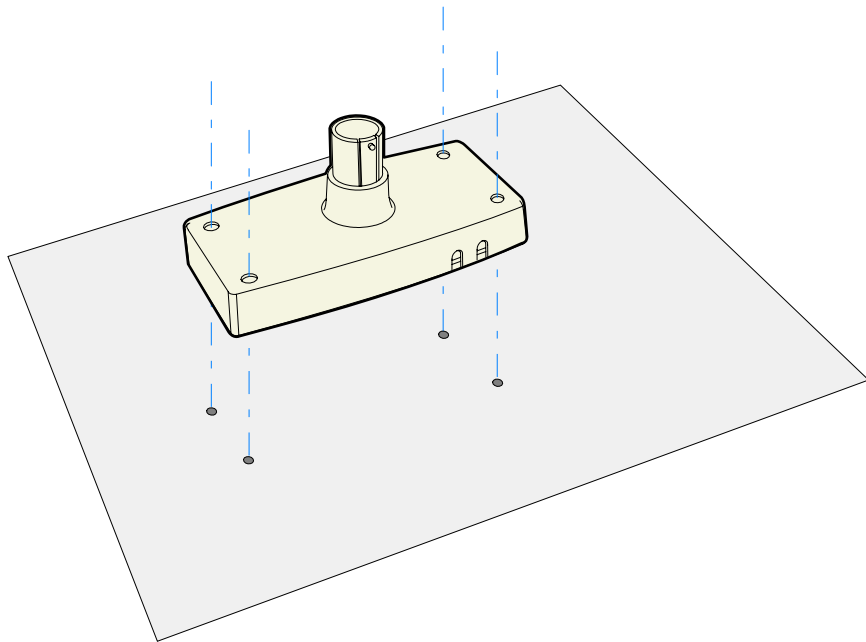
2. Remove the Cable Cover if applicable).

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

Adapter Sleeve

Tension Screw

21685
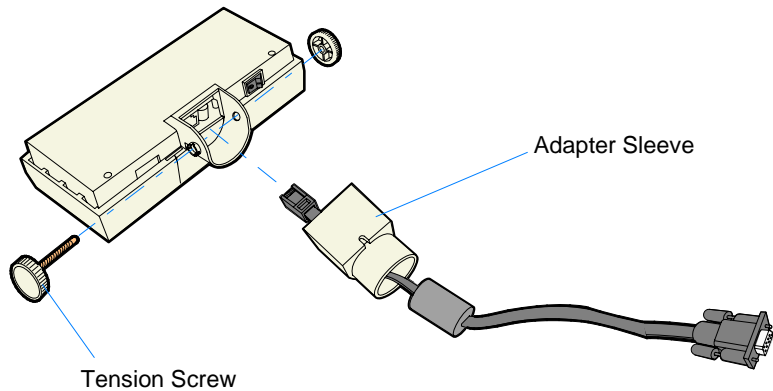
4. Remove the Base Plate from the Customer Display Base (4 screws).

Bottom Plate Screws

21678
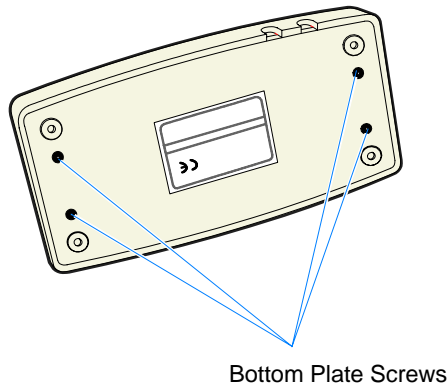
5. Route the Display Cable as shown below and connect it to the RJ connector on the Customer Display PCB.

6. Connect the RS-232 Cable as shown.

RS-232 Cable

Display Cable (RJ Connector)

21671
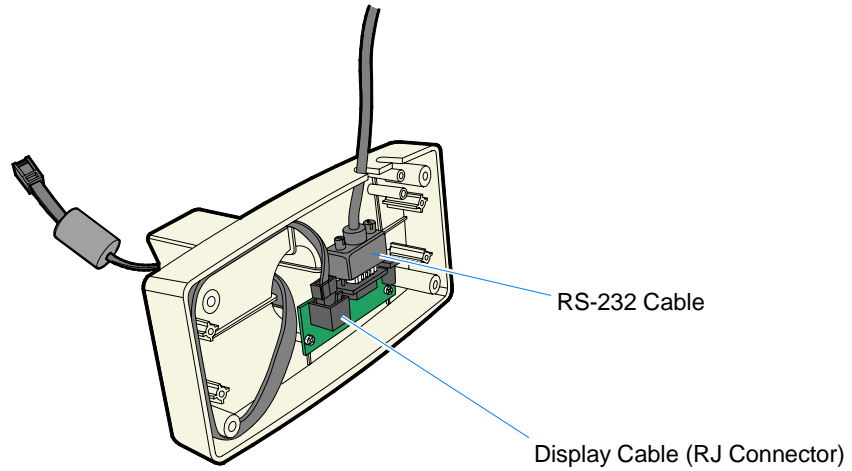
7. Route the Display Cable through the Customer Display Post and Adapter Sleeve.

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

Adapter Sleeve

Customer Display Post

Tension Screw

21673
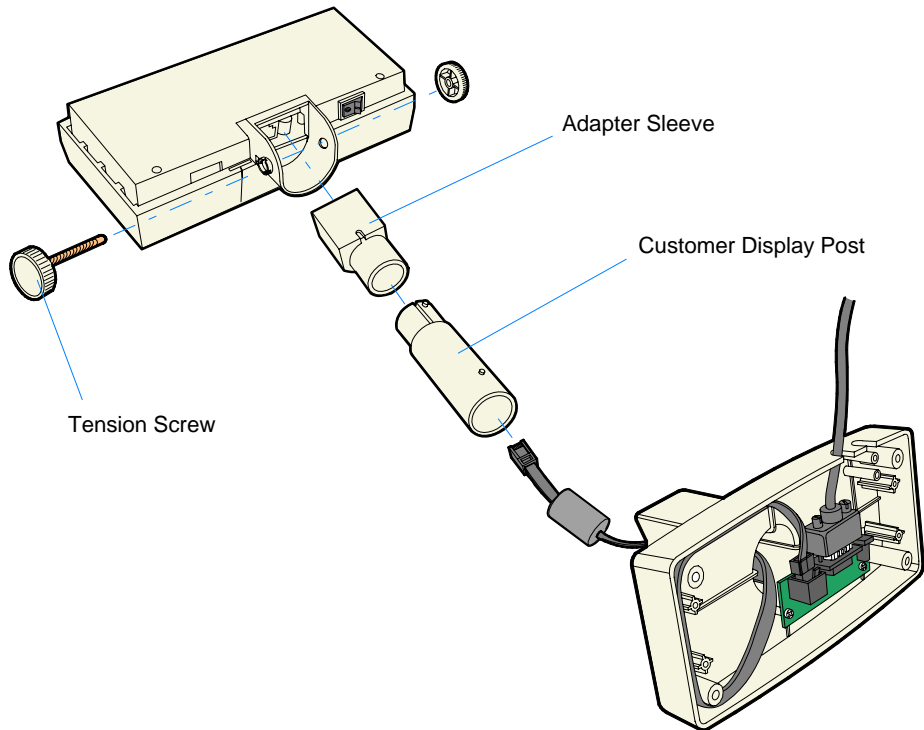
8. Connect the cable and install the Adapter Sleeve in the display, securing it with the Tension Screw.
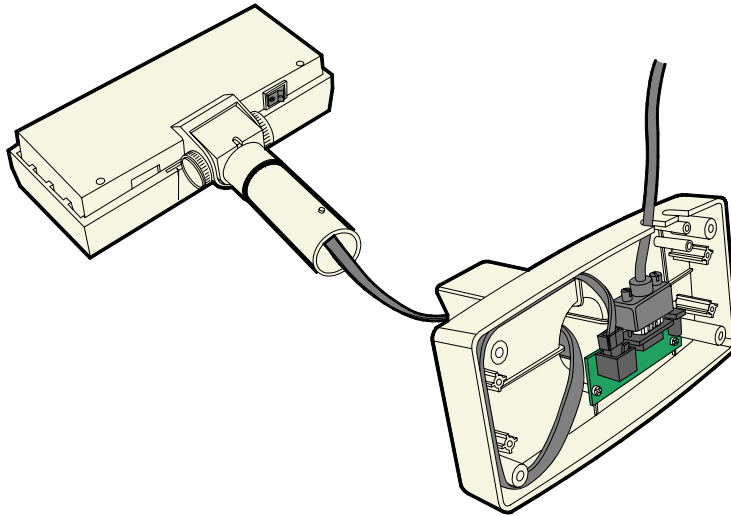
21686

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 Remote NCR 5972 Customer Display

There are two models of the 5972 Remote Customer Displays:

- Desktop Model
- Tall Post Model

5972 Customer Display
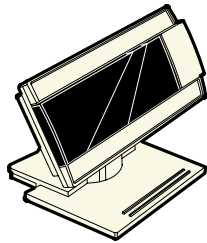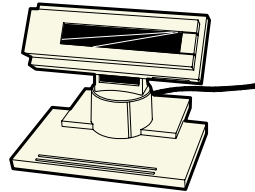
5972-1xxx (VFD)   5972-2xxx (LCD)   19749
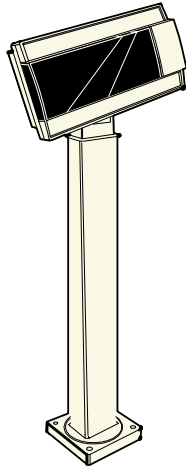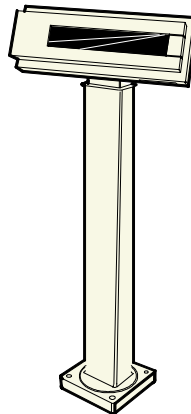
5972-1xxx (VFD)   5972-2xxx (LCD)   19750a

Installing the Display Mount

1. Locate the Display Mount within 4 meters (13 ft.) of the host terminal.

2. Determine if the cable should route down through the mounting surface or if it should run on top of the surface. Drill a hole if necessary.

3. **High-Post Mount:** If you are installing High-Post model secure the Mounting Plate with screws (4) provided.

Mounting Plate

4.06 mm (0.160 in.) Diameter

7.6 cm
(3.0 in.)
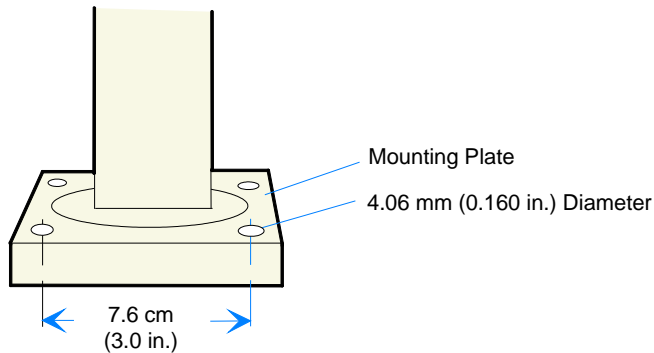
14622

Note: The Mounting Plate illustrated above is for the 5972.

4. Connect the Display Cable to a powered RS-232 connector 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.
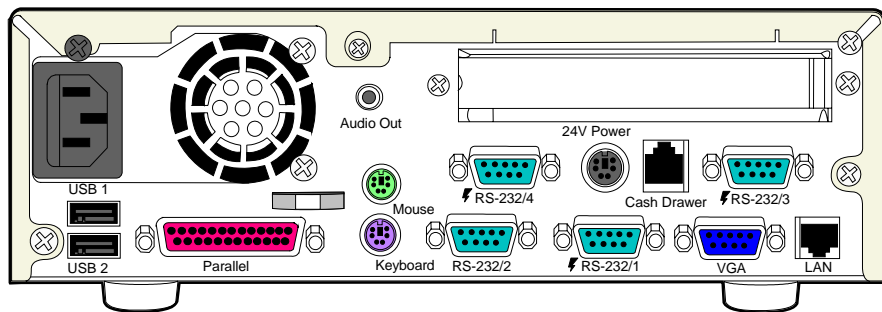
21589

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:

- 2182 Compact Cash Drawer
- 2183 Mid-range 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 transacation printer.

Cash Drawer Connector

21592

Cash Drawer Connector
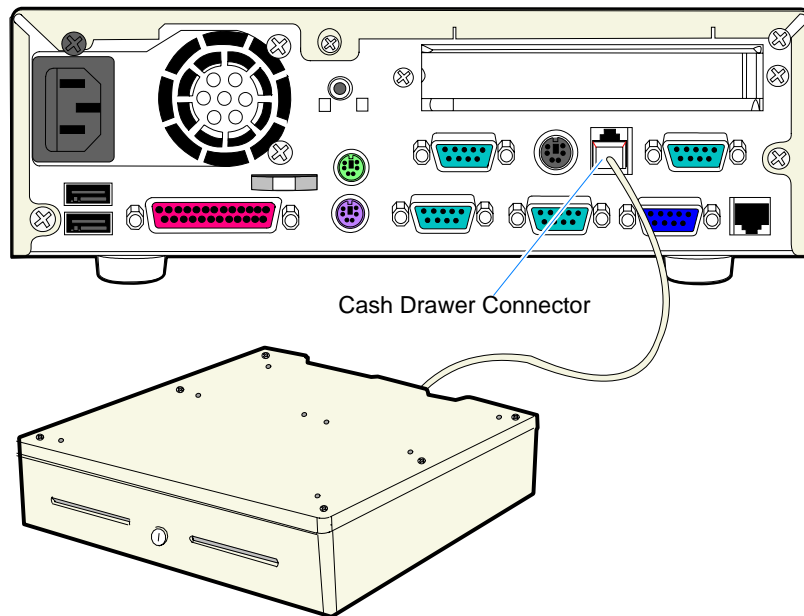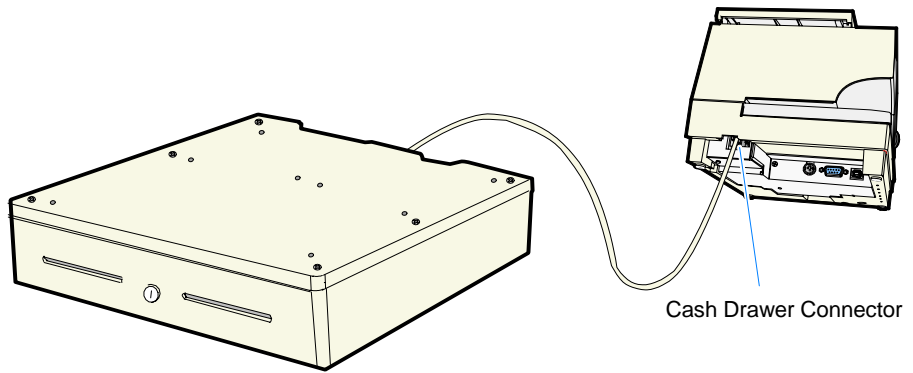
20440

Note: The RealPOS 30 does not support 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]**.

Special DynaKey Keypad Mode

If your Terminal is configured with a DynaKey or Touch Screen module refer to the following sections that discuss special keypad considerations. Otherwise, proceed to the **Configuration Setup Procedures** section.

Many of the Terminal setup routines require keys that are not present in the regular DynaKey keypad layout (such as the ESC and .0END keys). Although the DynaKey has a PC keyboard connector, a PC keyboard may not be readily available to the operator.

Note: No setup is required for the DynaKey module itself at installation unless the factory default configuration needs changing. The operational parameters can be changed using the *Wedge Configuration Utility* (G370-0701-0000) diskette or the *7452 Diagnostics and BIOS Images* (497-0406703) diskette.

To use the DynaKey without a PC keyboard attached to run the Terminal setup routines, you must place it in the Special DynaKey Keypad Mode. This mode replaces the normal keypad layout and function keys with special key assignments that are required to run setup. To enter the special mode, press the *7* and *9* keys simultaneously during POST diagnostics.

Note: The *7* and *9* keys must be the FIRST keys pressed during/after a power up, otherwise the keypad enters the normal layout.

The following key layout is active in the special mode.

26 **F1**		1 ←	2 ↑	3 **F1**
27 **F2**		4 →	5 ↓	6 **F2**
28		7 **Tab**	8 **End**	9 **-**
29		10 **7**	11 **8**	12 **9**	13 **ESC**

14419
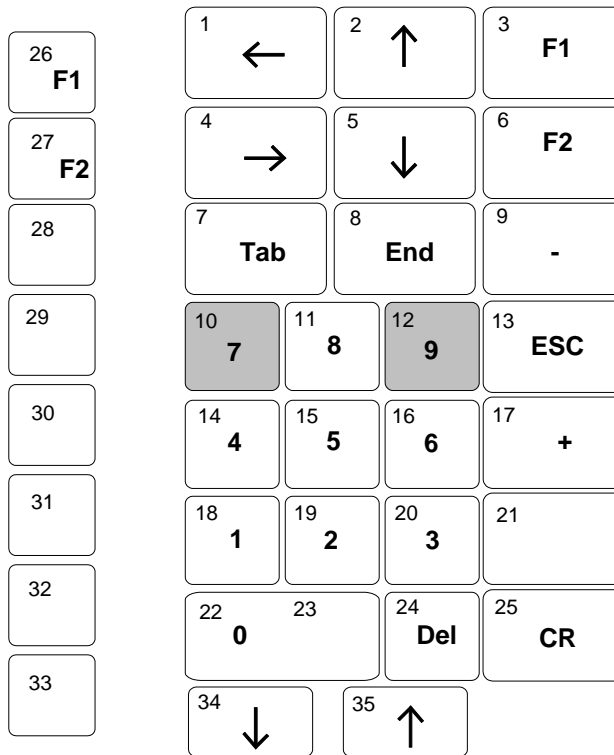
Normal DynaKey Keypad Operating Mode

After running setup the DynaKey can be reset to the normal mode by rebooting or by pressing the *7* and *9* keys simultaneously. The normal keypad layout is shown below.

26 F1	1 **Shift-F1**	2 **Shift-F2**	3 **Shift-F3**
27 F2	4 **Shift-F4**	5 **Shift-F5**	6 **Shift-F6**
28 F3	7 **Shift-F7**	8 **Shift-F8**	9 **Shift-F10**
29 F4	10 **7**	11 **8**	12 **9** / 13 **Cntl-F1**
30 F5	14 **4**	15 **5**	16 **6** / 17 **Cntl-F2**
31 F6	18 **1**	19 **2**	20 **3** / 21 **Cntl-F3**
32 F7	22 **0**	23 **Shift-F9**	24 **.** / 25 **CR**
33 F8	34 ↓	35 ↑	
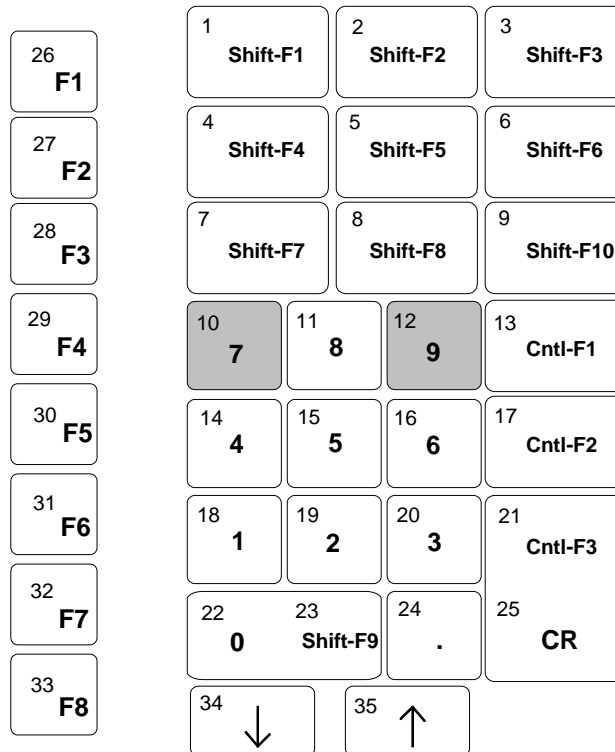
12389

Disabling Resources

Resources that are disabled in the BIOS (IRQs for COM ports/on-board LAN/secondary IDE) are still detected and installed (sometimes partially) in Windows. The resources are actually available.

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 drive.

- Teac USB CD-ROM Drive (2336-K208)

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.

DC Power

USB

DC Power

AC Power   21689
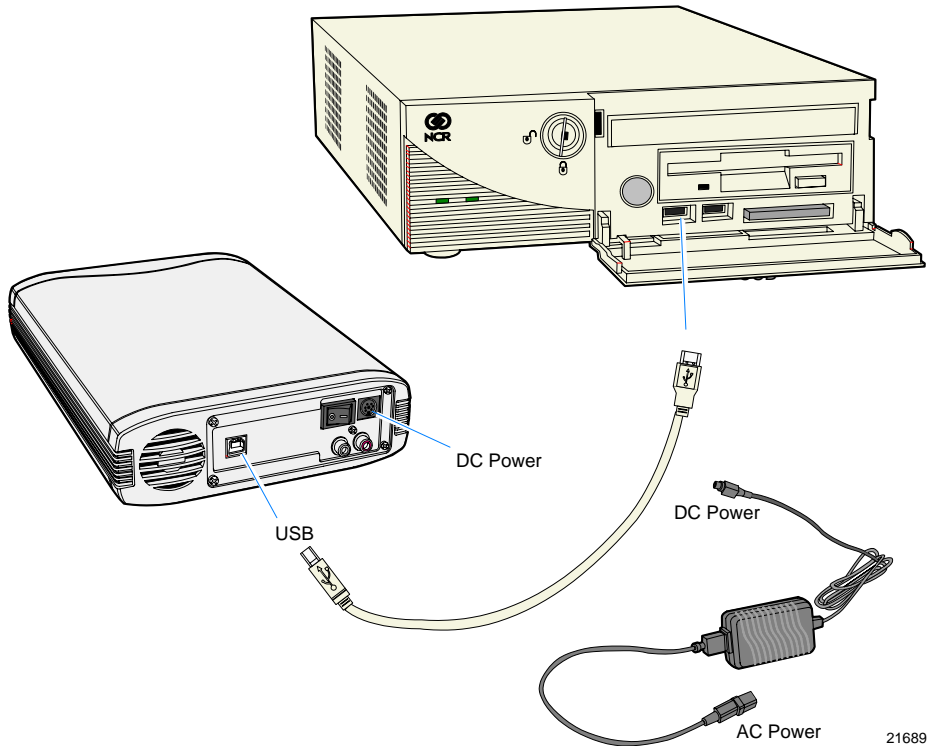
Note:

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]**.

Windows XPe	D370-0619-0100
DOS	D370-0623-0100

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 |                |
|          +----+                |
|                                |
+--------------------------------+
```

12. Remove the CD from the drive.

Completing the OS Installation

Windows XP Pro/Windows XPe

The system automatically reboots when the image recovery is complete and opens at the Welcome screen.

DOS

The system automatically reboots when the image recovery is complete and opens at the DOS C:\ prompt.

Gold Disk Contents

This section describes the contents of each of the Gold Disk Images, including all the additions and changes that were installed on top of the generic operating system.

NCR 7446-xxxx (WinXP Pro) OS Recovery Software
(LPIN: D370-0635-0100)

Installed Software:

- Microsoft Windows XP PRO w/ SP1
- Microsoft Internet Explorer 6.0 SP1 (6.0.2800.1106 SP1)
- Microsoft XP PRO Hotfixes (QFE's)
- Video - Intel Graphic Driver (6.13.01.3196) (i815VGA)
- LAN - RealTek RTL8139/810x Family Fast Ethernet NIC 5.612.413.2004
- Intel Chip Set Utility (5.01.1015)
- Audio - Intel(r)8280/BA/BAM AC'97 AC97_Codec-ADI

Software Drivers

The following drivers are not installed automatically, but can be installed from their respective locations (Readme files exist in these locations, as well):

- 3M TouchWare   version 5.64 SR3
    ```
    C:\Install\Drivers\Touch\disk1\Setup.exe
    ```
- Hampshire TSHARC USB Touch Drivers available (6.07)
    ```
    C:\Install\Drivers\Hampshire_USB_touch
    ```

Special Settings

Furthermore, the following settings/revisions are configured:

- Preinstalled XP Pro to include the Product ID Number (PID)
- Placed the Gold Drive Part Number, Date Created, LPIN, and Release in Registry under:
  `HKey-Local_Machine\Software\NCR\Gold Drive`
- Established a NTFS primary system partition that fills the entire drive
- Set virtual memory to 384
- Added NCR-specific EULA

Note: This product should only be used on NCR RealPOS 80/80c terminals with a Microsoft Windows XPe license.

Recommendation

For each operating system, NCR strongly recommends that any drivers placed in the `C:\Install directory` be left intact for the purposes of servicing and maintaining the system. If you are using this information in order to build your own operating system image and not using NCR's provided OS Recovery image as a base image, we recommend that all drivers that are installed be placed in a similar `C:\Install` directory for support.

NCR 7446-xxxx (WinXPe) OS Recovery Software
(LPIN: D370-0619-0100)

Installed Software:

- Microsoft Windows XPe w/ SP1
- Intel Extreme Video (6.14.10.3606)
- Intel Pro/100 LAN (7.0.26.0)
- Intel Chip Set Utility (5.01.1015)
- MicroTouch drivers available (5.64 SR1)
- Hampshire TSHARC USB Touch Drivers available (6.07)
- Edgeport USB drivers (2.30)

Software Drivers

The following drivers are not installed automatically, but can be installed from their respective locations (Readme files exist in these locations, as well):

- 3M-TouchWare `C:\Install\Drivers\Touch`
- Hampshire USB Touch `C:\Install\Drivers\Hampshire_USB_touch`

Special Settings

Furthermore, the following settings/revisions are configured:

- Preinstalled XPe to include the Product ID Number (PID)
- Placed the Gold Drive Part Number, Date Created, LPIN, and Release in Registry under:
  `HKey-Local_Machine\Software\NCR\Gold Drive`
- Established a NTFS primary system partition that fills the entire drive
- Set virtual memory to 384
- Added NCR-specific EULA

Note: This product should only be used on NCR RealPOS 80/80c terminals with a Microsoft Windows XPe license.

OS Customization

Windows XPe, as built by NCR, has a much larger memory footprint than previous Microsoft operating systems. In order to accommodate the wide a variety customer requirements, more functionality and services are built into the OS than are available in Windows NT, Windows 2000, or Windows XP Pro. If memory footprint or system performance appears sluggish there are a number of ways to reduce memory requirements and increase performance.

There are a number of services that may not be required by a customer. Some or all of the services listed below may be modified depending on customer requirements. The first column is the service name and the second column is the suggested startup setting.

```
6to4                         (Disable)
Client Services for Netware  (Disable)
Computer Browser             (Manual)
Cryptographic                (Disable)
Device Update Agent          (Manual)
Dist. Transaction Coord.     (Manual)
DNS Client                   (Manual)
Fax                          (Disable)
FTP Publishing               (Manual)
HID                          (Manual)
Help and Support             (Manual)
IMAPI CD-Burning COM Service (Disable)
Infrared Monitor             (Disable)
ISS Admin.                   (Disable)
IPSEC                        (Disable)
Message Queuing              (Disable)
Message Queuing Triggers     (Disable)
Messenger                    (Disable)
Network Location Awareness   (Disable)
Portable Media Serial Number (Disable)
Print Spooler                (Manual)
Protected Storage            (Disable)
Remote Registry              (Disable)
```

```
Secondary Logon Service      (Manual)
Shell Hardware Detection     (Disable)
Simple Mail Transfer         (Disable)
SmartCard                    (Disable)
SNMP                         (Disable)
SSDP Discovery Service       (Disable)
System Restore               (Disable)
TaskScheduler                (Manual)
TCP/IP Netbios Help          (Manual)
Telephony                    (Disable)
Terminal Services            (Disable)
Themes                       (Disable)
Upload Manager               (Disable)
Web Client                   (Disable)
Windows Time                 (Disable)
Wireless Zero Configuration  (Disable)
World Wide Publishing        (Disable)
```

In addition, performance may be increased by changing the System Properties Performance settings from letting "Windows choose what's best for my computer" to "Adjust for best performance" and possibly increased by lowering the display resolution.

The NCR RealPOS Windows XPe Operating System Recovery Software provides the means of restoring the operating system to the terminal hard disk of a NCR RealPOS 7457 terminal. The bootstrap program (di_natl.bsd) and disk recovery boot image (di_natl.bid) are downloaded to the target terminal over the network and restores the hard disk to the preinstalled state as shipped from the factory.

Recommendation

For each operating system, NCR strongly recommends that any drivers placed in the C:\Install directory be left intact for the purposes of servicing and maintaining the system. If you are using this information in order to build your own operating system image and not using NCR's provided OS Recovery image as a base image, we recommend that all drivers that are installed be placed in a similar C:\Install directory for support.

Chapter 5: BIOS Updating Procedures

Introduction

This chapter discusses procedures on how to update the terminal BIOS 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 drive.

- Teac USB CD-ROM Drive (2336-K208)

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.

Prerequisites

The following are required to perform a BIOS update using a CD.

- Bootable USB CD-ROM drive
- Keyboard
- Download the BIOS Software from the NCR website.

    http://www.ncr.com

    a. At this site, select **Support**.
    b. Under Related Items, Services; select **Drivers and Patches**.
    c. Select **Retail Support Files**.
    d. Select **Retail Platform Software**.
    e. Under Terminals, select **7446**.
    f. Select your terminal model.

g.   Select your OS.

h.   Select the BIOS *.exe file

i.   Save the software to your hard drive.

Creating the Bootable Media

After downloading the BIOS software you need to create either a
bootable Flex diskette or CD.

Creating a Bootable Flex Diskette

1.   Insert a flex diskette in the PC that has the BIOS software present.

2.   Execute the BIOS software (**7446_*nn*.exe**). This is a self-extracting
     file that will extract the files to the current directory.

3.   Execute the **Runme.bat** file.

4.   At the DOS window prompt hit any key to continue. The program
     then creates the bootable flex diskette containing the BIOS update
     software.

Creating a Bootable CD

Use the bootable flex diskette created above and follow your CD-RW
drive manufacturer's procedures for creating a bootable CD.

BIOS Update

Connecting an External USB CD-ROM Drive

1. Connect the external USB CD-ROM drive to a *USB* connector on the terminal.
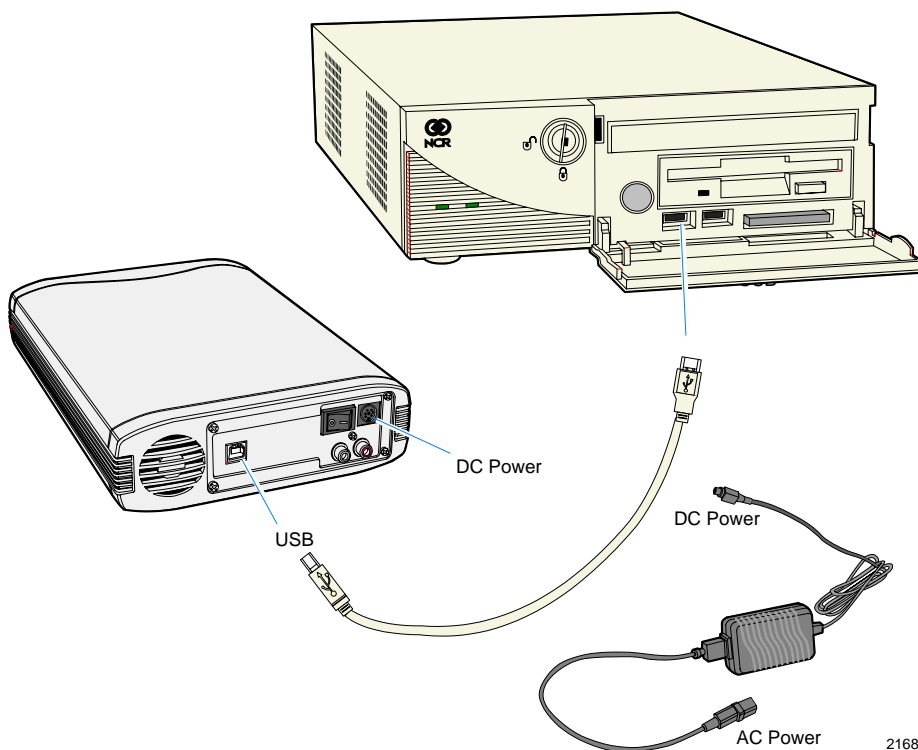
2. Connect the Power Supply to the *DC Power* connector on the CD-ROM and to an AC outlet.

3. Apply power to the CD-ROM drive (switch on the back).

Updating 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 flex diskette drive, select **Floppy.**
   - 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. Insert the media containing the BIOS update software.

8. Follow the screen prompts on the client to update the BIOS. You can select two methods to run the update program.

   - Automatic BIOS Update – update process runs unattended

     Note: You will see a prompt for terminal model and serial number information if the program detects invalid information in the current BIOS, or if you are replacing the processor board, in which case there is not model/serial number information in the BIOS.

     Important: Model/Serial Number is mandatory.

   - Interactive BIOS Update – permits you to input/replace the model/serial number information that is stored in the BIOS.

     Note: Model/Serial number data that is currently stored in the BIOS is displayed during power up.

9. You should see a green window, indicating a successful update.

10. Remove the media before the system reboots.

Chapter 6: 2x20 Customer Display (7446-K451)

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℃
Operating Humidity	30%-85%
Storage Temperature	-10 - 55℃
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
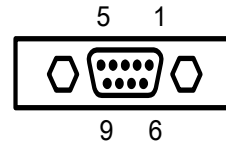
Pin Assignment

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
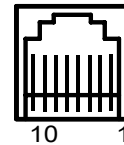
Display Panel Connector

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 $1 \leqq x \leqq 20, y=1,2$	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≦n≦38h)	Command type select
US # n m	1F 23 n m, (n=0 or 1,0<m≦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	1 B 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

Country		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
	ASCII Code												
	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	β
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	¡	«	»
B0H	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C0H	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	=	╬	╧
D0H	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▀	▐	▌	▄
E0H	α	ß	Γ	π	Σ	σ	μ	τ	Φ	θ	Ω	δ	∞	ø	$\in$	$\cap$
F0H	$\equiv$	$\pm$	$\geq$	$\leq$	⌠	⌡	$\div$	$\approx$	°	•	·	$\sqrt{}$	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	∫	$\overline{\times}$	□	-1	2	3	x	½	¹/	√	±	■
A0H	SP	°	⌈	⌋	`	·	□	□	□	□	□	□	□	□	□	□
B0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
C0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
D0H	□	□	□	□	□	□	□	□	□	□	□	□	□	□	"	°
E0H	↑	↓	←	→	↵	↳	↱	↰	⇐	⇒	″	"	«	»	∴	∵
F0H	≦	≧	≠	≑	‖	|	⊥	⸪	⸬	∼	~	≡	⊤	Ω	⊕	Θ

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	×	ƒ
A0H	á	í	ó	ú	ñ	Ñ	a	o	¿	®	¬	½	¼	¡	«	»
B0H	░	▒	▓	│	┤	Á	Â	À	©	╣	║	╗	╝	¢	¥	┐
C0H	└	┴	┬	├	─	┼	ã	Ã	╚	╔	╩	╦	╠	=	╬	¤
D0H	ð	Ð	Ê	Ë	È	€	Í	Î	Ï	┘	┌	█	▄	¦	Ì	■
E0H	ó	ß	ô	ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	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	¡	«	»
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	ů	ć	ç	Ļ	ë	õ	õ	î	ź	ä	ć
90H	é	Ĺ	í	ô	ö	Ľ	ĭ	ś	ś	Ö	Ü	Ŧ	ł	į	x	č
A0H	á	í	ó	ú	ą	ą	ž	ž	ę	ę		ź	č	ş	«	»
B0H	▓	▒	▓	│	┤	á	â	ě	ş				ż	ż		
C0H					─	┼	ă	ă						═		¤
D0H	╨	╤	ã	ë	ã	ň	í	î	ě			█	▄	ţ	ů	■
E0H	ó	β	ô	ń	ń	ň	š	š	ŕ	ú	ŕ	ũ	ý	ý	ţ	´
F0H	─	˝	˛	ˇ	˘	§	÷	˺	°	¨	·	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	А	Б	В	Г	Д	Е	Ж	З	Й	Й	К	Л	М	Н	О	П
90H	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Эį	Ю	Я
A0H	а	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	Ѓ	К	Н	θ	Υ	Υ	h	ð	ɾ	k	h	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$\leqq$n$\leqq$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

```c
#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 7: 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

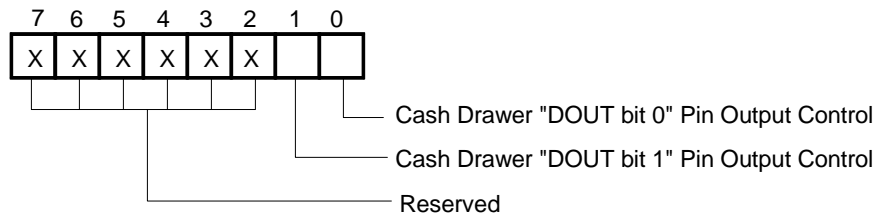| Pin	Signal
1	GND
2	DOUT bit0
3	DIN bit0
4	12V/24V
5	DOUT bit1
6	GND

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

Register Location: 200h
Attribute: Write
Size: 8bit

21924

Bit 7-2: Reserved

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

    = 1: Open the Cash Drawer

    = 0: Allow closing the Cash Drawer

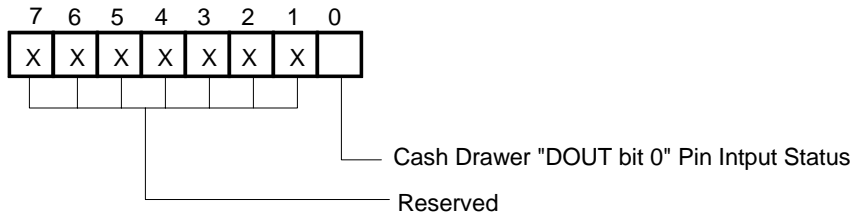Bit 0: Cash Drawer "DOUT bit0" pin output control.

    = 1: Open the Cash Drawer

    = 0: Allow closing the Cash Drawer

Note: Please follow the Cash Drawer control signal design to control the Cash Drawer. It is recommended that you control bit1/0 at the same time.

Cash Drawer Status Register

Register Location: 201h
Attribute: Read
Size: 8bit

```
  7   6   5   4   3   2   1   0
┌───┬───┬───┬───┬───┬───┬───┬───┐
│ X │ X │ X │ X │ X │ X │ X │   │
└───┴───┴───┴───┴───┴───┴───┴───┘
```

Cash Drawer "DOUT bit 0" Pin Intput Status

Reserved

21925

Bit 7-1: Reserved

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

= 1: Cash Drawer is closed.

= 0: Cash Drawer is opened or does not exist.

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

- 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

- The I/O address 201h bit0 =1 indicates the Cash Drawer is opened or not exist.
- The I/O address 201h bit0 =0 indicates the Cash Drawer is closed.

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");
        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);
    }
}
```
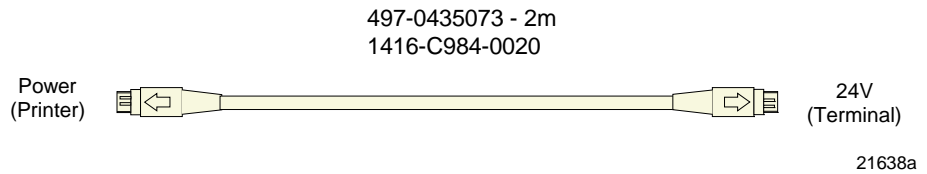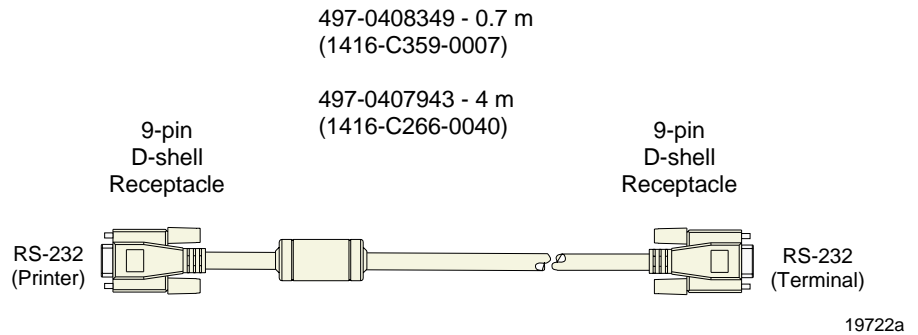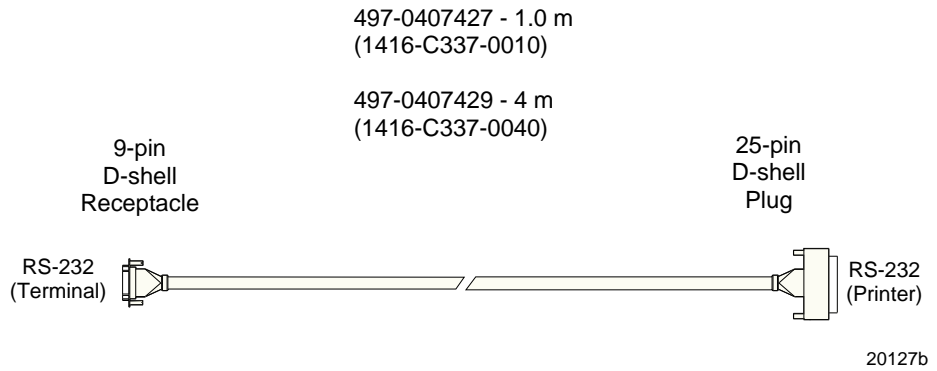
Appendix A: Cables
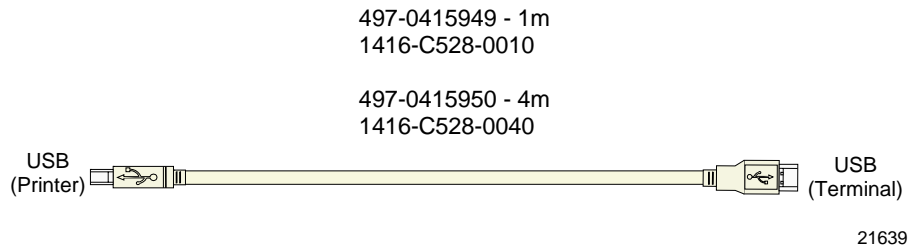
Printer Cables

Printer Power Cable (24V)

497-0435073 - 2m
1416-C984-0020

Power
(Printer)

24V
(Terminal)

21638a

RS-232 (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

RS-232 (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

Standard USB

497-0415949 - 1m
1416-C528-0010

497-0415950 - 4m
1416-C528-0040

USB
(Printer)

USB
(Terminal)

21639

Scanner Cables

7872 or 7875 Scanner/Scale (RS-232)
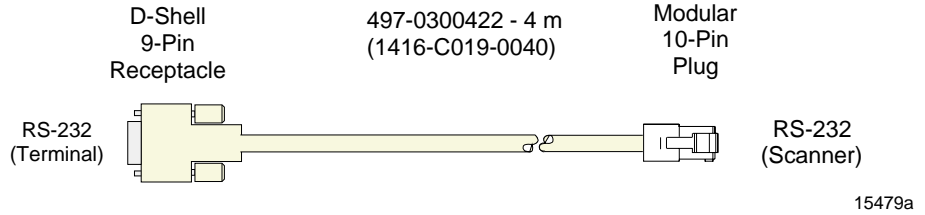
D-Shell
9-Pin
Receptacle

497-0300422 - 4 m
(1416-C019-0040)

Modular
10-Pin
Plug

RS-232
(Terminal)

RS-232
(Scanner)

15479a

7892 Scanner (Powered RS-232)

497-0425593 - 3.0 m
(1416-C643-0030)

D-Shell
9-Pin
Receptacle

Modular
10-Pin
Plug

RS-232
(Terminal)

Scanner

20450a

7882 Scanner (Powered RS-232)

497-0419723 - 4.0 m
(1416-C653-0040)

D-Shell
9-Pin
Receptacle

Modular
10-Pin
Plug

RS-232
(Terminal)

Scanner

19728a

7837 Scanner (Powered RS-232)

497-0426457 - 2.5 m
(1416-C806-0025)

Powered
RS-232
(7456/7458)

Scanner

D-Shell
9-Pin
Receptacle

Modular
10-Pin
Plug

21206
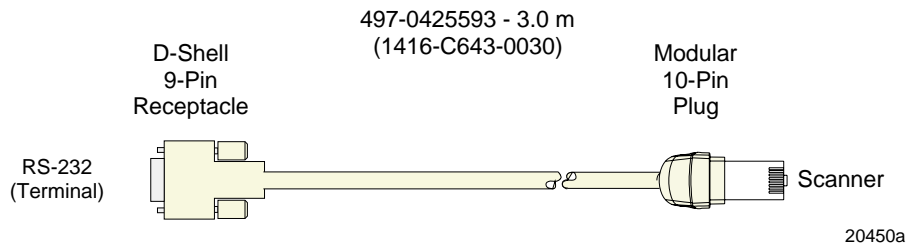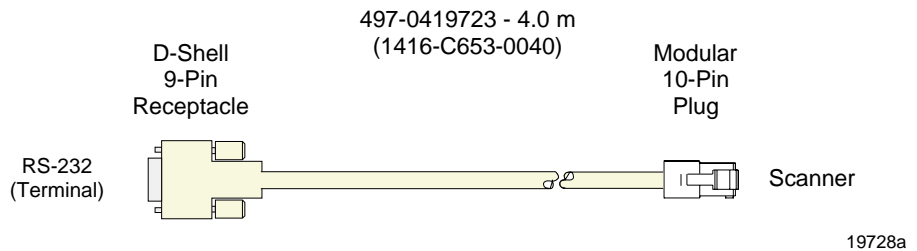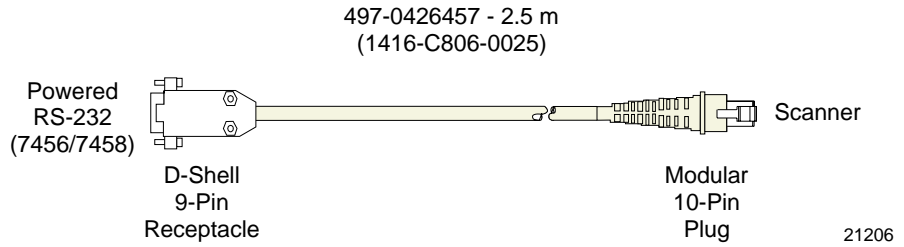
7837 Scanner (RS-232, External Power)

External
Power

497-0412951 - 2.5 m
(1416-C429-0025)

RS-232
(Terminal)

Scanner

D-Shell
9-Pin
Receptacle

Modular
10-Pin
Plug

21154
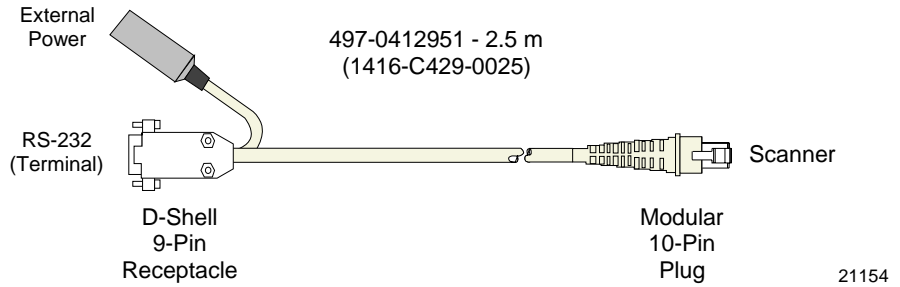
Display Cables

VGA Display, Mono

Sub Miniature D-Shell
15-Pin
Plug

497-0008164 - 4 m
1416-C042-0040

Sub Miniature D-Shell
15-Pin
Receptacle

VGA
(Terminal)

VGA
(CRT Display)
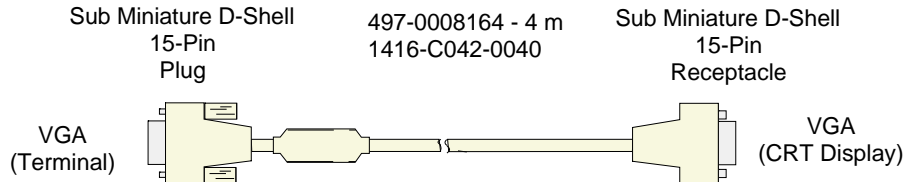
14607a

VGA Display, Color

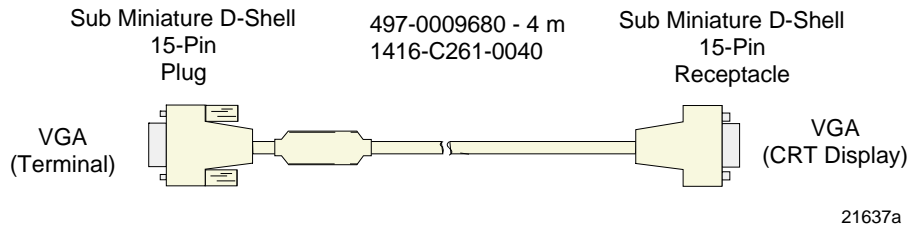| 1.0 m	Black	497-0428080	1416-C840-0010
1.5 m	Black	497-0428068	1416-C839-0015
1.0 m	White	497-0424530	1416-C753-0015
1.5 m	White	497-0424531	1416-C754-0010

Sub Miniature D-Shell
15-Pin Plug
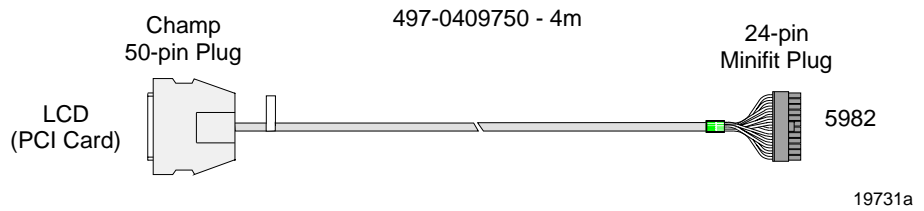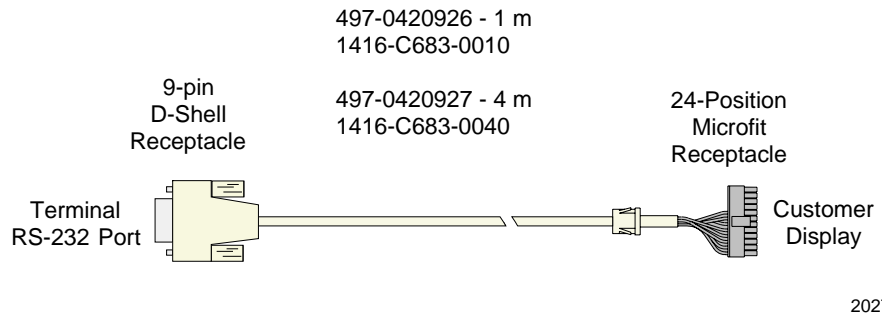
Sub Miniature D-Shell
15-Pin Receptacle

VGA
(Terminal)

VGA
(Display)
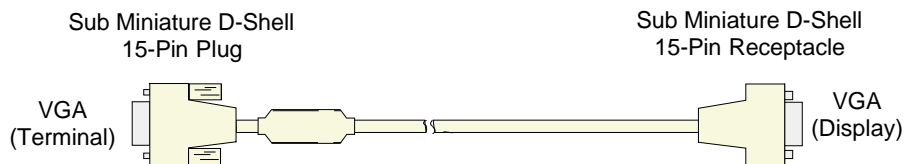
16318a

CRT AC Power Extension

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

19741a

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

VGA
(Terminal)

VGA
(CRT Display)

21637a

5982 5-Inch LCD

Champ
50-pin Plug

497-0409750 - 4m

24-pin
Minifit Plug

LCD
(PCI Card)

5982

19731a
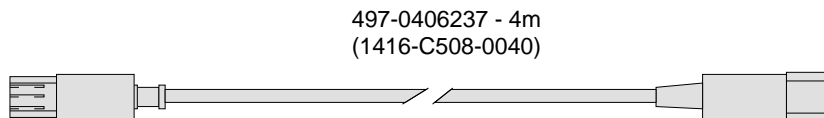
5972 VFD Customer Display (Powered RS-232)

497-0420926 - 1 m
1416-C683-0010

9-pin
D-Shell
Receptacle

497-0420927 - 4 m
1416-C683-0040

24-Position
Microfit
Receptacle

Terminal
RS-232 Port

Customer
Display

20279

Ethernet, 10/100BaseT Cable

Modular
8-Pin
Plug

497-0008905 - 3.0 m
(1416-C059-0030)

Modular
8-Pin
Plug
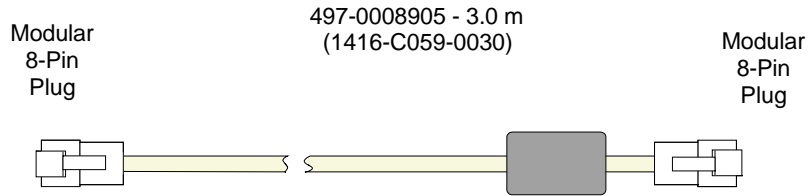
16298a

PS/2 Keyboard Extension Cable

6-pin
Mini-DIN
Plug

497-0406056 - 1.8 m
(1416-C281-0018)

6-pin
Mini-DIN
Receptacle

PS/2
(Terminal)

PS/2
(Keyboard)
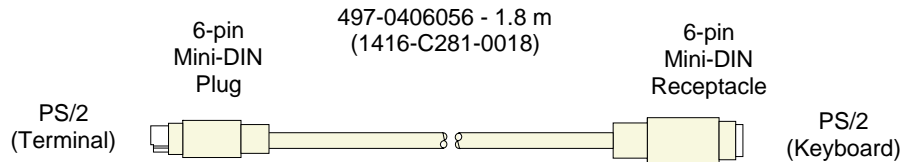
15403a

Signature Capture/Electronic Payment Terminal Cable

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

9-pin
Mini-DIN
Plug

497-0418406 - 4.0 m
(1416-C634-0040)

9-pin
D-shell
Receptacle

RS-232
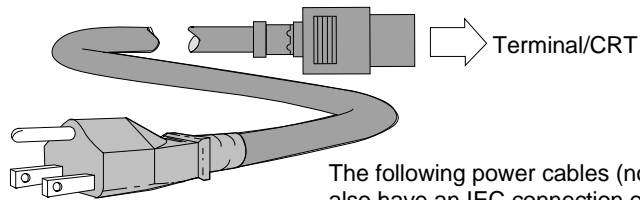(EFT Unit)

RS-232
(Terminal)
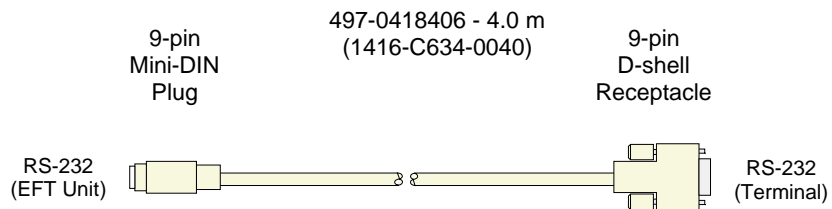
19723a

Power Cables

AC Power

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

Terminal/CRT

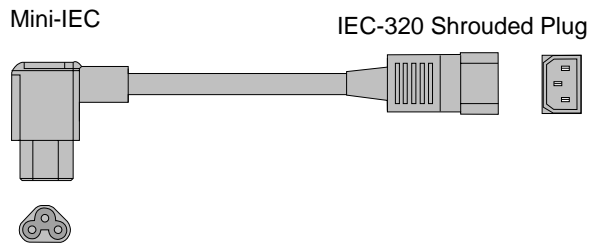The following power cables (not shown)
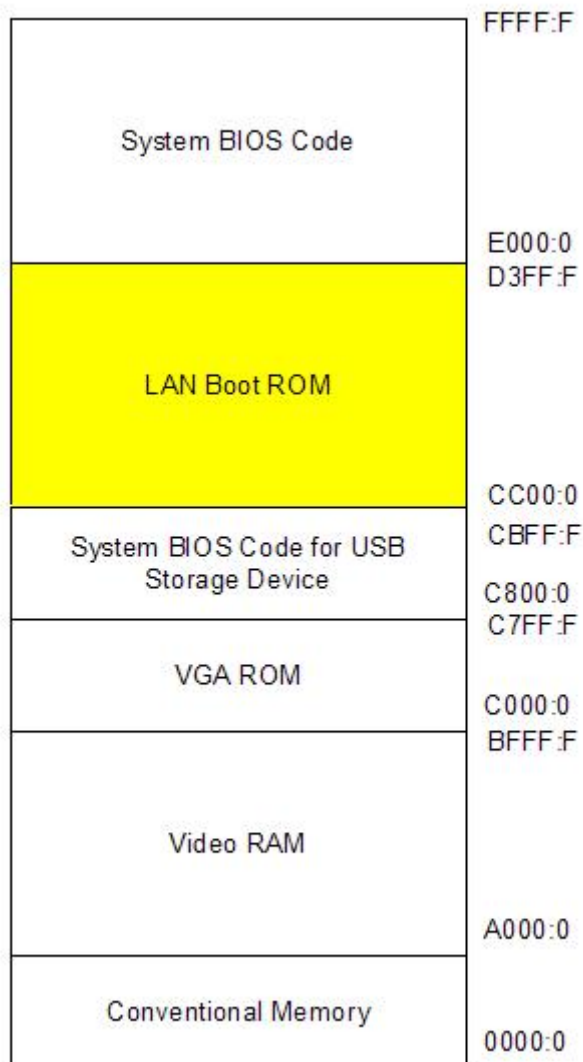also have an IEC connection of 45 mm:
  1416-C320-0030   006-8601011 - SEV
  1416-C321-0030   006-8601012 - U.K.
  1416-C322-0030   006-8601019 - Australia
  1416-C323-0030   006-8601010 - International
  1416-C391-0030   006-8605488 - China
  1416-C393-0030   006-8601001 - Japan Twist-Lock
  15405a

497-0436751
1416-C131-0001

Mini-IEC   IEC-320 Shrouded Plug

21926

Appendix B: Memory Maps

	FFFF:F
System BIOS Code	
	E000:0
	D3FF:F
LAN Boot ROM	
	CC00:0
System BIOS Code for USB Storage Device	CBFF:F
	C800:0
	C7FF:F
VGA ROM	
	C000:0
	BFFF:F
Video RAM	
	A000:0
Conventional Memory	
	0000:0

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.