NCR 7454 Retail Terminal

Release 2.2

Hardware User's Guide

NCR
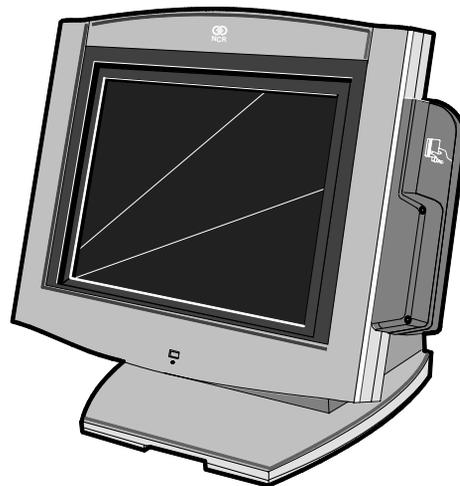
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B005-0000-1256
Issue H

Preface

Audience

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

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References

- *NCR 7454 Retail Terminal Hardware Service Guide*
  (B005-0000-1342)

- *NCR 7454 Retail Terminal Site Preparation Guide*
  (B005-0000-1257)

- *NCR 7454 Retail Terminal Software User's Guide*
  (B005-0000-1259)

- *NCR 7401/7454 Retail Terminal Parts Identification Manual*
  (B005-0000-1072)

- *NCR Retail Platform Software Terminal Utilities Guide*
  (B005-0000-1503)

- *NCR FitClient Software User's Guide*
  (B005-0000-1235)

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Revision Record

Issue	Date	Remarks
A	Sept 00	First issue (separated 7401 and 7454 sections out of B005-0000-1069)
B	Oct 00	Added new motherboard with Intel Pentium III/ Celeron processors
C	Feb 01	Updated to Release 2.0 Removed hardware service information from this document which was previously called the 7454 Retail Terminal Hardware Installation and Service Guide (B005-0000-1256) and renamed it the 7454 Web Kiosk Hardware User's Guide (B005-0000-1256). The hardware service information was placed in a new document, the 7454 Retail Terminal Hardware Service Guide (B005-0000-1342).
D	June 01	Updated Connector Row Bracket illustrations, updated serial port information and added Dual RS-232 Port Kit (7454-F072) installation instructions
E	Aug 01	Additional updates for Release 2.0
F	Jan 02	Updated for Release 2.1; updated Appendix A and Appendix B; added BIOS Crisis Recovery procedures
G	Jun 02	Removed all DSTN (Passive) LCD references.
H	Dec 02	Updated for Release 2.2.

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
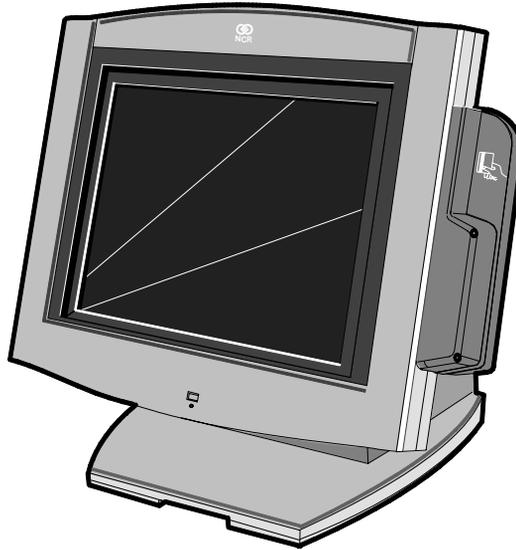
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Introduction

The NCR 7454 Retail Terminal is an interactive touch screen terminal designed specifically for the hospitality marketplace. Housed in an integrated, compact cabinet, the 7454 supports a complete set of peripherals.

The major hardware features of the 7454 are a flat panel display with touch screen input and LAN connectivity, plus optional magnetic stripe reader, scanner, stereo audio, and wireless LAN.

The 7454 is Internet/Intranet ready. System loading can occur from a network server, and software and data content are delivered from a server through standard internet protocols.

Serial Number/Model Number Label

The unit's serial number, model number, tracer number, and date of manufacture are included on a label on the back of the Core Module. To view the label, tilt the Core Module and remove the cable cover.

Note: The serial number is repeated on the non-MSR side of the Core Module.

NCR 7454-3504-M001	Class/Model
50-12345678	Serial Number
Date: 11/15/01 Mfg	Date Manufactured
F000,F017,F127,F503,F752,F009,F101,F601	Feature Number(s)

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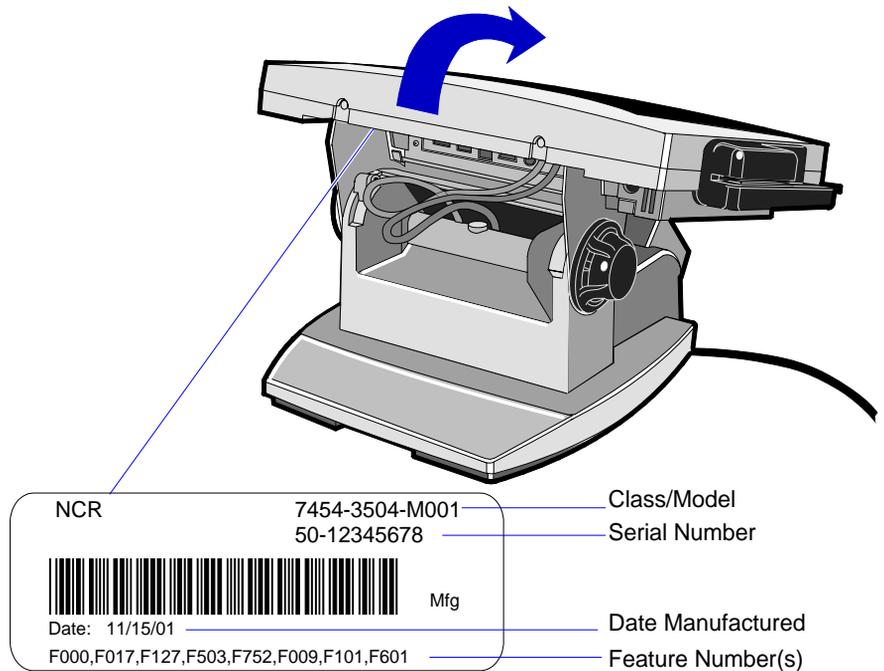
Hardware Modules

Base Unit

- Processor Board

  - Intel® Pentium® III or Celeron-class processor

  - SVGA chipset

  - MPEGII chipset

  - 32 MB RAM on board (Celeron 600 MHz processor)

  - 64 MB RAM on board (Celeron 700 MHz processor)

  - 4 MB Video Memory

  - 1 MB Flash BIOS (not CMOS)

  - Four RS-232 ports (two optionally powered)

  - 10/100BaseT Ethernet LAN chipset, Wake-on-LAN support, and RJ-45 port

  - PC Audio with an internal mono speaker

  - Sound Blaster® 16-compatible audio chipset

  - Two USB type A ports

  - PS/2 keyboard port

  - External VGA display port.

  - External stereo speaker port

  - Internal PS/2 mouse (dedicated to the touch screen)

  - One SODIMM (Small Outline DIMM) RAM socket (32 MB)

  - IDE support for a hard disk and an optional compact flash

- POS Connector Board

  – Cash drawer port (supports two drawers via a Y-cable)

  – Internal parallel port (dedicated to the optional customer display)

- 12.1-Inch Operator Display - capacitive or resistive touch LCD, available in active matrix models

- 15-Inch Color TFT LCD Operator Display panel with capacitive touch screen

- 2.5" hard disk

- Integrated Motion Sensor, capable of waking up the terminal from a low power state

- Integrated Power Supply

- Reset switch which can be used to recover from a lock-up condition

- 3-meter Ethernet cable

- 85W Power Supply

- U.S. power cord

Hardware Options

- Intel Pentium III processor

- Intel Celeron (700 MHz) processor

- Integrated MSR (3-track ISO or JIS)

- Integrated Stereo Module

- Integrated Infrared Sensor

- Dual PCMCIA (for wireless LAN)

- Gray (G105) or Charcoal Gray (CG01) cabinet colors

- Mounting options: Table-top, Wall

- 7837 Hand-held Scanner
- 7892 Bi-modal Presentation Scanner
- Customer displays
  - No customer display
  - Parallel
    - Integrated 4x20 (low or high-post)
    - Remote 2x20
  - VGA (Dual Display)
    - CRT (Kit)
    - Analog LCD (Kit)
- 256 MB Compact Flash (IDE Bus)
- Cash drawers
  - 2113 Cash Drawer (modular)
  - 2189 Cash Drawer (modular)
  - 2260 Cash Drawer (modular)
  - Dual cash drawer cable
- 7454 Printers:
  - 7158 Thermal Receipt/Impact Printer
  - 7167 Thermal Receipt/Impact Printer
  - 7194 Thermal Receipt Printer
  - 7196 Thermal Receipt Printer
  - 7197 Thermal Receipt Printer
  - 2214 Thermal Fiscal Printer
  - Remote printer cables
  - Signal extenders for remote printers
- 2757 Kitchen Display System

- PC keyboard
  - Keyboard Shelf
- USB RS-232 Port Server
  - USB Serial Converter
- CD-ROM Drive

Terminal Components not Supported

It is important to note that the terminal does not support the following components.

Not supported	Alternative implementation
CMOS for hard totals, logs, and tallies	Hard disk, compact flash, or server storage
Removable media, e.g., a flex disk	LAN communication to an NT server via standard protocols
SLP terminal loading	Local storage, TCP/IP networking and PXE loading
Keylock for security (X, L, R, S)	Reset switch based security
ISA and PCI Expansion slots	USB and LAN based devices (future)
DVD ROM	
Internal UPS	External UPS
Manual Video and audio controls	Software controlled
Windows® 3.1, Windows NT® 3.51, OS/2	Windows NT 4.0, MS-DOS®, Windows® CE, Windows® 95, Windows® 98, Windows® 2000, Windows® XPe
Intel 133 MHz, 166 MHz, and 266 MHz Pentium Processors AMD 366 MHz and 400 MHz Processors	Intel Pentium III 550 MHz Intel Celeron® 600 MHz and 700 MHz processors

System Configuration Diagram

2214 7196 7166 7892 7837 2010 Coin Dispenser

2336-K008

7197 7194 7167 7158

RS232 (4) 2 Optionally Powered

PS/2 KBD

VGA

USB

Processor Board

Note: 7158, 7167, 7194, and 7197 are available in both RS-232 and USB.

POS Connector Bd.

Customer Display (Parallel)

Ethernet

Cash Dwr

Audio

5972/5973 5974

2336-K007

2260/2183/2189

2nd Cash Drawer (Y-Cable)

2113

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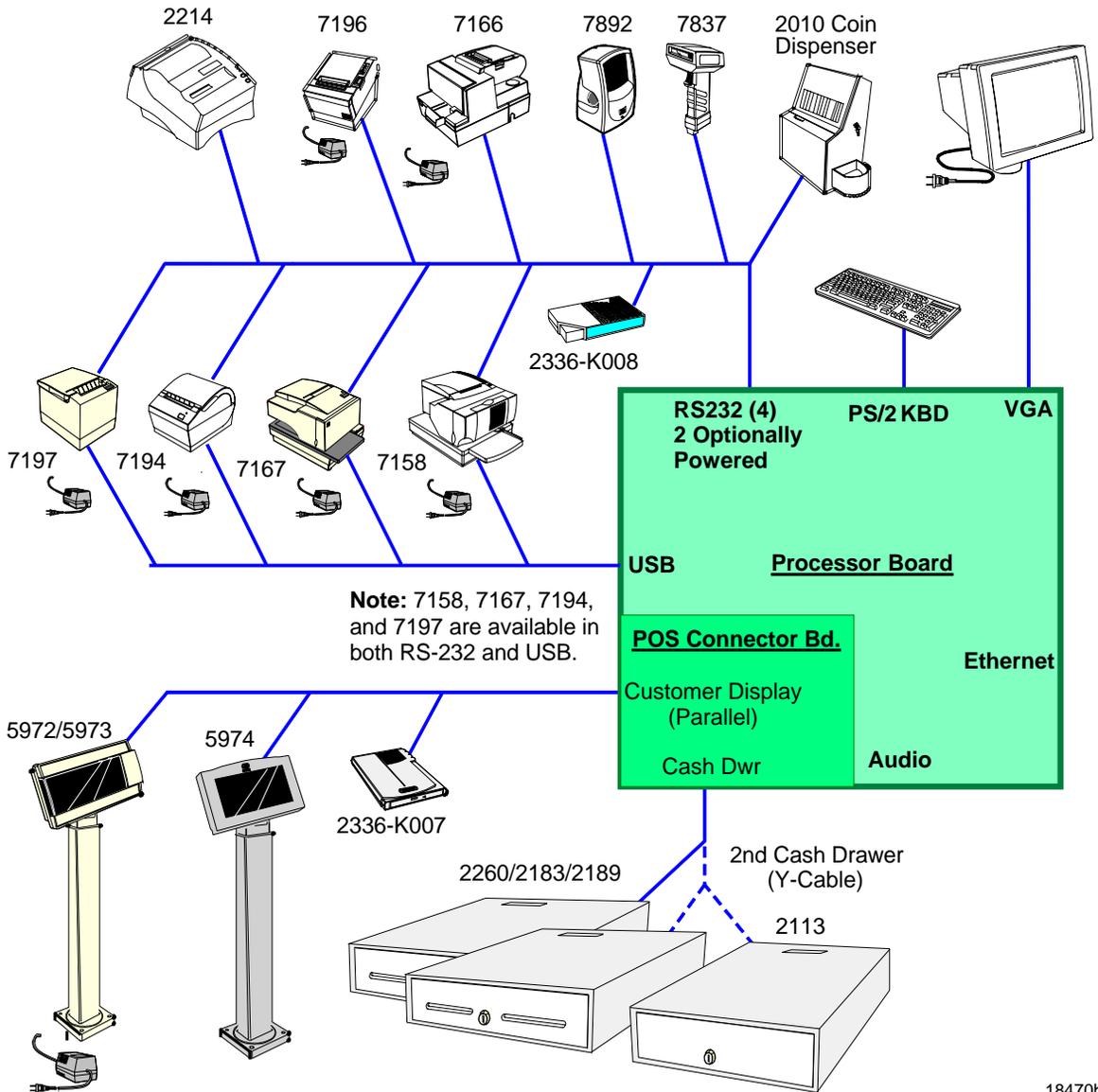
Hardware Module Descriptions

Processor Board

Processor/Chip Set

The terminal uses an Intel architecture processor, which permits it to leverage existing software drivers and applications, as well as provide the greatest flexibility in choosing an operating system. This provides several other advantages:

- Capable of SW MPEG-1 playback at 30 frames per second with 22 KHz stereo audio (may be limited by OS constraints)

- Sound Blaster-compatible audio capability

- Java Benchmark performance > 1000 Caffeinemarks, JIT compiled

- OS support to run Java

- Expansion capabilities for optional features and future requirements (ISA/PCI bus and USB)

The following sections identify processors, system bus speed, and on-board memory available on 7454 Release 2.x processor boards:

Release 2.0/2.1
- Intel 600 MHz µPGA2 Celeron Processor and 440BX chipset consisting of the 82443BX (North Bridge) System Controller, also called the MTXC, and the 82371EB (South Bridge) PCI ISA accelerator, also called the PIIX4E.

- 100MHz system bus

- 32 MB memory with ability to add SODIMMS to increase the memory capacity of the terminal

Release 2.2
- Intel 700 MHz Celeron Processor (BGA) on board, removing the µPGA2 processor socket. Intel 440BX PC chipset same as in Release 2.0/2.1

- 100MHz system bus

- 64 MB memory with ability to add SODIMMS to increase the memory capacity of the terminal

Video Subsystem

The Release 2.x Motherboard uses the Silicon Motion (SMI) (LynxEM4 or LynxEM4+), with 4MB internal memory, 64 Bit memory bus, AGP 1x Support, 66MHz bus interface through AGP port, TFT panel support up to 1280x1024.

The video subsystem supports the following LCD types:

- 12.1-Inch active matrix (TFT) 800x600 with 64 k colors

- 15-inch active matrix (TFT) 1024x768 with 262 k+ colors

Support for the LCD integrated display is provided internally. External support for SVGA monitors (800x600) [or better] resolution and 64 K [or better] colors) is provided by a CRT 15-pin D-shell connector.

The LCD brightness is software controlled. The terminal does not have hardware controls for brightness or contrast.

The LCD back lighting is also software controlled. In addition to OFF and ON modes, a *dimmed* mode is supported in the hardware to permit increased tube life. If appropriate software drivers are loaded, full brightness is restored when touched, motion detection (Motion Sensor section), or an application request (i.e., to play promotional material on a preset schedule).

Dual Displays

The Summa POS Motherboard is dual display (LCD and CRT) capable. In a dual display environment the 7454 terminal supports 16-bit color when both displays are connected to the motherboard. Both displays must have the same maximum resolution capability. Refer to the following information for details about the implementation of a dual display configuration.

- *Lynx Family Control Panel Specification 1.2* on the NCR 74xx Base System and Client Third party Drivers CD-ROM (Product ID: D370-0111-0100) or in the video.exe self-extracting Video Drivers file on the Retail Solutions Specific Third Party Products *Drivers and Patches* web site at:
  http://www.ncr..com/support/support_drivers_patches.asp?Class=retail_TPP.

- *Retail Customer Information Display User's Guide* (BD20-1431-B) on the NCR Information Products web site at:
  http://www.info.ncr.com/eHome.cfm

Ethernet 10/100Base-T LAN Communications

The terminal contains a 10/100Base-T Ethernet PCI connection. Ethernet 100Base-T is also known as *Fast Ethernet*. The Boot ROM for diskless boot functionality is included in the 1 MB system ROM. The hardware is compatible with the TCP/IP, DHCP, and TFTP protocols required for remote boot of the platform. Appropriate software must be used to enable each protocol used over the Ethernet link.

The terminal may be connected to either a 10 Mbps or 100 Mbps Ethernet connection. The hardware automatically selects the correct speed (if enabled by software to do so).

The LAN hardware supports wakeup packet capability as defined in the Device Class Power Management Specification, Network Device Class (available from the Microsoft® Web site).

When the platform is in the Soft OFF state (refer to *Advanced Power Management* section that follows), receipt of a Wakeup Packet on the LAN can return the system to the ON state, if this feature is enabled by software.

Note: Due to limitations of the LAN controller and the OS, all features described in the Network Device Class specification may not be available.

100Base-T is wired identically to 10Base-T, except that the twisted pair cable must be Category 5 and the hubs must permit 100 or 10/100 Mbps operation. Although 10Base-T will operate on Category 3 twisted pair, or NCR "747" cable, an upgrade to Category 5 is required for 100Base-T.

A customer desiring to use the terminal in an existing 10Base-T environment can do so and simply run at 10 MB. ***In order to upgrade to 100Mbps, Category 5 cable and 100 or 10/100 hubs must be installed.*** NCR strongly recommends the use of Category 5 for all new cabling, even if the customer initially intends to run only 10Base-T.

LED Indicators for Link Integrity (verifies cable and hub connection are good) and LAN speed is provided on the Processor Board near the row of connectors at the bottom of the e-box. The LED is ON (yellow) when the speed is running at 100 Mbps.

Link Integrity is provided to the PC chipset to permit boot-up software to verify the presence of the LAN connection. Software must provide 2 seconds after power-up in order for the Link Integrity signal to become valid.

Wireless LAN Communications

Where a wired Ethernet connection is not desired a wireless LAN adapter may be installed in the PCMCIA socket. This requires that the PCMCIA daughter-card feature be installed. A wireless LAN used in the terminal must meet the following requirements:

- Integrated antenna that meets the requirements of PCMCIA (PC Card) Extended Type 2 card definition (a maximum of 5-cm additional length).

- Power consumption within the capabilities of the PCMCIA daughter-card.

- Signaling requirements within the capabilities of the terminal PCMCIA interface. The main restriction is that DMA transactions are not supported over the PCMCIA interface.

- Device drivers for the targeted operating system must exist.

- Appropriate infrastructure (server support, Base Stations, Ceiling Antennas, etc) must be present in the installation site, and the maximum RF range of the wireless system must not be exceeded.

Interoperability - While the 802.11 standard provides an interoperable protocol definition, there are vendor-specific extensions to the protocol that encourage users to stay with one supplier's equipment. This also applies to wireless infrastructure and access points, 802.11 does not govern this operation. Mixing of RF suppliers on a site is not recommended until the RF suppliers have demonstrated interoperability.

The wireless networks operate at speeds of 1-11 Mbps with 2 percent packet loss typical. The application developer must be aware of the performance limitations and design applications that are acceptable to the customer when run over the slower network.

Remote Wakeup over the wireless network is not possible because the cards do not support it. An alternative is to use the system real-time clock wake up at a scheduled time.

Depending on the OS environment, Remote Boot may be supported, but due to the slow network speed a large boot image may take an unacceptably long time to load. The application developer needs to ensure that the load is of reasonable size.

The wired Ethernet connection is not certified for use in configurations where a wireless adapter is installed.

Universal Serial Bus

The Summa POS Motherboard provides three ports, one of which is reserved for integrated devices (not externally accessible). Only two of the three USB ports on the Summa POS Motherboard can be active at the same time. If the internal auxiliary USB port is enabled, one of the two ports on the main connector row becomes disabled. This functionality is controlled through the BIOS setup menu.

Note: USB peripherals require support from the operating system, which is currently limited to Windows 98.

Serial Ports

The Summa POS Motherboard provides two RS-232 ports (9-pin D-shell connectors, Ports 1 and 2) directly on the Motherboard and supports two additional RS-232 ports. Ports 3 and 4 require an optional harness connection to the Motherboard. Ports 1 and 3 can be supplied with +12 V DC on Pin 9 when properly set up in the BIOS. The total power drawn by Ports 1 and/or 3 must be no greater than 1 amp at +12 V DC. Refer to the following table for RS-232 pinout information.

The BIOS provides flexibility in mapping resources. However, a fully-loaded system (2 PCMCIA cards that require IRQs, four serial ports in use, USB in use, parallel port in use, and MSR) may not have enough available IRQs to support all serial ports. Use a USB serial port expander to overcome this PC architecture limitation.

RS-232 DB-9 Male Connector Pinout		
Pin	Port A	Port B
1	DCD	DCD
2	RXD	RXD
3	TXD	TXD

RS-232 DB-9 Male Connector Pinout		
Pin	Port A	Port B
4	DTR	DTR
5	GND	GND
6	DSR	DSR
7	RTS	RTS
8	CTS	CTS
9	RI <u>or</u> +12*	RI

* If Port 1 or 3 is powered, pin 9 will be +12 V.

Hardware Monitor

The hardware monitor generates an interrupt to the system whenever any of the internal voltages used by the system processor goes above or below the acceptable operating range. An interrupt is also generated when the temperature of the Processor exceeds safe levels. Software can use this indication to slow or stop the system and/or force a reset.

PCI Expansion Header

A single expansion header is provided to support optional features, such as the PCMCIA for Wireless LAN Board. This board supports two Type 2 or one Type 3 PCMCIA type cards.

IDE Header

A standard IDE header is provided to support the 2.5" hard disk drive or the 64 MB and 256 MB compact flash.

Audio

The base unit has Sound Blaster-compatible audio. Wave table synthesis is not supported. FM synthesis and MIDI are supported in the hardware, but requires software driver support to function.

Higher quality integrated stereo speakers may be added as an option to the terminal. The amplifier is located on the Processor Board; the speaker output is provided on a header that receives the harness from the speaker module. In addition, a Line Out is provided on a 3.5mm stereo jack that permits connection of external amplified speakers.

The integrated stereo speakers, or an amplifier connected to Line Out, must be used in order to play Sound Blaster (audio subsystem) audio. However, an internal EUI speaker provides PC speaker functionality (beeps and tones) for all configurations.

The volume control can be set using the Windows OS Control Panel. There is no volume control under DOS.

The PC speaker sounds (such as beeps and touch clicks) are directed into the audio subsystem and are audible if speakers are connected.

Magnetic Stripe Reader

A 3-track MSR head is available as an option. The ISO and JIS card format is supported.

When card data is read, an interrupt is generated. A software device driver for the MSR must be loaded to enable the application to process the data.

Touch Screen Controller

The MicroTouch® "Excalibur" chip is used to interface the touch panel. This controller supports MicroTouch capacitive panels.

In order to save an RS-232 port, the touch data is delivered to the system through the mouse interface. This requires a mouse-aware touch device driver for the appropriate OS.

When the system is operating in the *dimmed* display mode, touch activity can restore full brightness if instructed by software to do so. When system is in *low power* mode, touch activity can generate the mouse port interrupt (IRQ12).

The Summa POS Motherboard supports the following touch screen LCDs;

- Sharp TFT LCD/capacitive touch screen (F002)

- Sharp TFT LCD/resistive touch screen (F004)\

- 15-inch LG TFT LCD/capacitive touch screen (F008)

Processor Board Connectors

All connectors are either keyed or impossible to plug incorrectly due to mechanical design of the product.

External Connectors	Internal Connectors
VGA CRT RGB 15-pin D Shell	LCD
Ethernet RJ45	Back light Inverter
Dual USB Type A	Integrated Speaker Module
External Stereo speaker (3.5mm jack)	MSR
Power supply	Touch screen (PS/2)
RS-232 9-pin D shell (two, one with +12 V power option)	
PS/2 Keyboard	Motion Sensor / Power Indicator
Customer Display	PCI Expansion header
Cash Drawer	IDE
20-pin high density RS-232 Conversion connector	Parallel port (POS Board header)
Microphone	Cash Drawer port (POS Board header)
S-Video	

Compact Flash

The optional compact flash replaces the hard drive in the unit. The 64MB compact flash is large enough to support a Windows CE load. The 256MB compact flash can be used in a Windows XP embedded environment. When using the Windows XP embedded OS, an additional 128MB SDRAM SODIMM is required to support the necessary virtual memory requirements.

NCR Retail Specific Hardware

The Processor Board contains logic that provides support for the custom retail interface. The logic controls the following features:

- Dual Cash Drawer Support
- Cash Drawer Diagnostic Support
- Magnetic Stripe Reader Interface
- Motion Detector
- Touch Screen Interface

An integrated retail specific feature of the processor is the cash drawer circuitry. The onboard circuitry internal to the board provides the control for two external cash drawers. A portion of the POS Board header (J6) is provided on the board to interface to the dual cash drawer connector. Header J6 only contains the control signals; it does not provide power. Software controls the cash drawer(s) through I/O port 00Exh. This means it can be I/O ports E0/E1h, E2/E3h, E4/E5h, or EA/EBh depending on the configuration of the SMC I/O controller's GPIO port(s). Default setting is E0/E1h.

Cash Drawer I/O Port Bit Definition:

Bit #	Description	Bit = 1	Bit = 0
7	Solenoid B Control	Turns off solenoid output	Activates solenoid output
6	Solenoid A Control	Turns off solenoid output	Activates solenoid output
5	Reserved	Reserved	Reserved
4	Reserved	Reserved	Reserved
3	Solenoid B Status	Solenoid B output active	Solenoid B output inactive
2	Solenoid A Status	Solenoid A output active	Solenoid A output inactive
1	Reserved	Reserved	Reserved
0	Cash Drawer(s) Status	Drawer(s) open	Drawer(s) closed

Note: Bits 2 and 3 are set to '1' by each device reset.

The cash drawer interface can be diagnosed remotely. For security reasons, the cash drawer diagnostics mode must first be activated by pressing an external momentary switch (SW2). The intention is for authorized personnel to be present when the cash drawer diagnostic tests take place.

There is only one cash drawer status signal; therefore, bit 0 is the status of either cash drawer or both cash drawers.

Power LED

The Processor Board provides support for an external power LED through the onboard Motion/Power LED connector. This LED is controlled through the SMC 37C935 GPIO pins. Once the SMC chip is programmed to support the Power LED function on GPIO pin 13, the LED is turned "on" anytime all power to the Processor Board is good. The system's power management software has the option to turn the LED off indicating the system is in a power-managed mode.

MSR

The MSR interface supports a maximum of 3 tracks of magnetic stripe information for support of ISO or JIS format cards. Activate the MSR interface by enabling it in *BIOS Setup* under IO Configuration. The MSR interface controller is a memory-mapped device, which can reside at system memory addresses CA000, CC000, or D0000. If MSR capability is not desired, it may be disabled through *BIOS Setup*.

Board BIOS

The Processor Board uses a Phoenix BIOS, which is stored in Flash ROM and easily upgraded through the network connection or serial port. The Flash EEPROM also contains the Setup utility, Power-On Self Tests (POST), and APM 1.2. The board also supports system BIOS shadowing, which enables the BIOS to execute from onboard write-protected DRAM.

The BIOS displays a sign-on message during POST identifying the type of BIOS and a five-digit revision code.

FLASH memory Implementation

The Intel E28F800B5-T70 Flash component is organized onboard as 1024 K x 8 (1 MB). While a typical PC BIOS image including video and LAN boot ROM code normally fits in 256 K on the Pentium Board and 512 K in the Pentium III/Celeron board, the boards support a 1 MB flash ROM. The current Phoenix BIOS release only requires 256 K of this 1 MB total. The Flash device contains the PC System BIOS along with the Video BIOS and LAN boot ROM which compresses the ROM images into a single binary image.

The Flash device is divided into four areas, as described below.

System Address		FLASH Memory Area
F0000H	FFFFFH	64 K Main BIOS
EE000H	EFFFFH	8 K System BIOS Reserved during boot
ED000H	EDFFFH	4 K Plug and Play ESCD Storage Area
E0000H	ECFFFH	52 K System/VGA BIOS Reserved during boot

BIOS Upgrades

Flash memory makes distributing BIOS upgrades easy. A new version of the BIOS can be installed from the hard disk, network or through a serial port.

The disk-based Flash upgrade utility, PHLASH.EXE, ensures the upgrade BIOS extension matches the target system to prevent accidentally installing a BIOS for a different type of system.

Setup Utility

The ROM-based Setup utility permits the system configuration to be modified without opening the system for most basic changes. The Setup utility is accessible only during the Power-On Self Test (POST) by pressing the <F2> key after the POST memory test has begun and before boot begins. A prompt may be enabled that informs users to press the <F2> key to access Setup.

Note: An external alphanumeric keyboard is recommended for running the BIOS CMOS Setup Utility. Otherwise, a Touch Screen can be used.

Plug and Play
The Processor BIOS also has a setup option to support the Windows runtime plug and play utilities. When this option is selected, only devices critical to boot are assigned resources by the BIOS. Device Node information is available for all devices to ensure compatibility with Windows 95. System configuration information is stored in ESCD format. The ESCD data is cleared upon loss of the CMOS voltage.

Advanced Power Management
The Processor BIOS has support for both 1.1 and 1.2 Advanced Power Management (APM). The version of APM drivers loaded in the operating system by the user determines what specification the BIOS adheres too. In either case the energy saving Standby mode can be initiated by a keyboard hot key sequence or a time-out period set by the user.

When in Stand-by mode, the Processor Board reduces power consumption by utilizing the processor System Management Mode (SMM) capabilities and also spinning down hard drives and turning off VESA DPMS compliant monitors. During setup, the user may select which DPMS mode (Stand By, Suspend, or Off) is sent to the monitor. The ability to respond to external interrupts is fully maintained while in Stand-by mode enabling the system to service requests such as in-coming data or network messages while unattended. The user may also select any keyboard or mouse activity to take the system out of the energy saving Standby mode. When this occurs, the monitor and IDE drives are turned back on immediately.

APM is disabled in BIOS by default; therefore, the user must enable this feature. The system must be configured with an APM driver in order for the system power saving features to take effect.

Operator Display
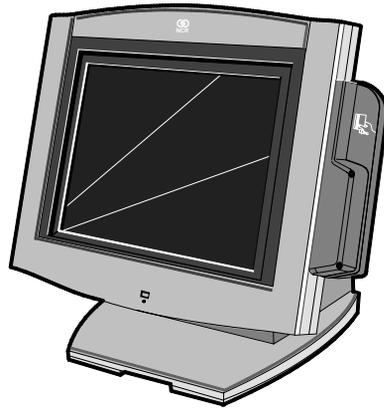
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The 7454 is available with two LCD types

- 12.1-Inch TFT (active matrix) 800x600 with 64K colors

- 15-inch TFT (active matrix) 1024 x 768 with 262K+ colors

Contrast control is set by software, using a digital potentiometer on the Processor Board. The terminal does not have a user-accessible contrast adjustment. Software can set a default value after reading the Panel ID.

Display contrast changes with temperature.

LCD Adapter Board

The signals from the LCD header on the Processor Board are brought to the LCD on a harness. Since there are multiple pin configurations and connector types being used on the LCD, a small adapter board is used to receive the LCD harness and map the signals into the correct pinout for the LCD panel. This board has a connector that plugs directly into the LCD panel.

LCD Backlight Inverter Module

An Inverter Board supplies power for the LCD Backlight, which is a separate module in the terminal. The inverter has a connector that receives power, ground, and a Backlight dimming signal from the Processor Board. The inverter generates the high voltage necessary to start and run dual CCFL Backlights.

A fuse located on the Inverter Board protects power to the inverter. This fuse protects the system from damage in the event of a Backlight or Inverter Board fault. The fuse is not field replaceable; if it blows, the safety characteristics of one or more components on the Inverter Board may have been compromised and the Inverter Board should be replaced.

If one or both Backlight tubes become disconnected or otherwise open-circuited, protection circuitry shuts down the inverter. This avoids over-powering a single tube and also protects against high voltage shorting.

Touch Screen

The Touch Screen completely covers the LCD and is mounted directly in front of the LCD, behind the front plastic bezel of the terminal. The touch controller on the Processor Board supports capacitive and resistive touch glass.

The touch glass has an integrated harness that is routed into the Processor Board enclosure and is connected to a header on the Processor Board. The touch glass has a glare-reducing texture that also helps hide fingerprints.

NCR 7454 Integrated Customer Display

The NCR 7454 Integrated Customer Display supports four lines of twenty 5x7 characters. It is available in a low profile or high-post model.
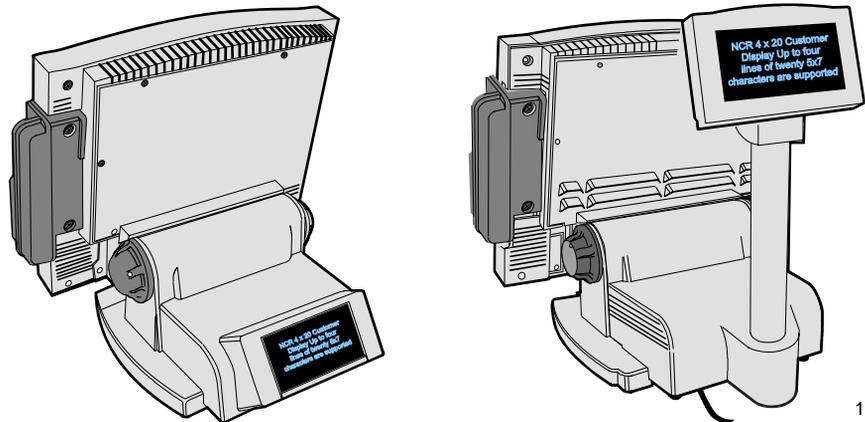
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The 7454 Retail Terminal also supports these remote customer displays:

- NCR 7454 4x20 Customer Display. This display uses the same display module as the 7454 Integrated Customer Display.

- NCR 5972-1100 Vacuum Fluorescent Display (VFD). This display uses a parallel port.

NCR 5973 International VFD Customer Display

The NCR 5973 VFD (Vacuum Fluorescent Display) is an optional display device for the 7454 Retail Terminal. The VFD is available in models that have a combination of:

- Dark gray cabinetry
- Mounting configurations
- System specific cables

Table Top Mount

12271
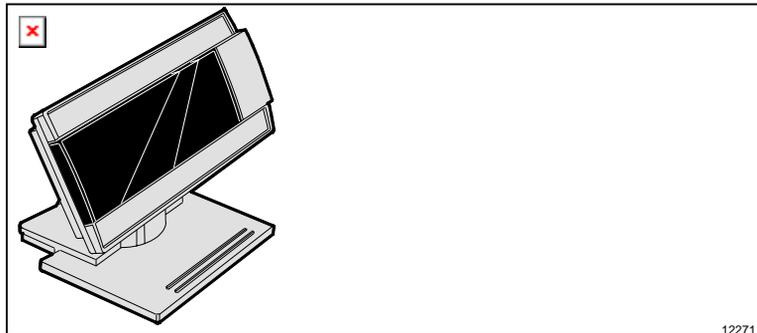
16" High Post Mount
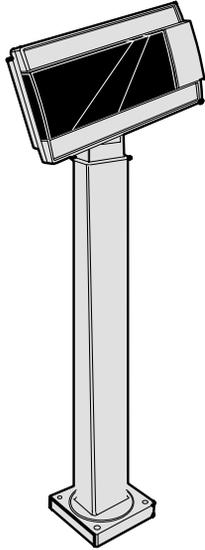
17198

Features

Magnetic Stripe Reader

A single 3-track analog Magnetic Stripe Reader (MSR) is available as a feature, supporting ISO and JIS format cards. When the MSR is not desired, a filler piece for the MSR section is included to make the unit appear uniform.

MSR

18286
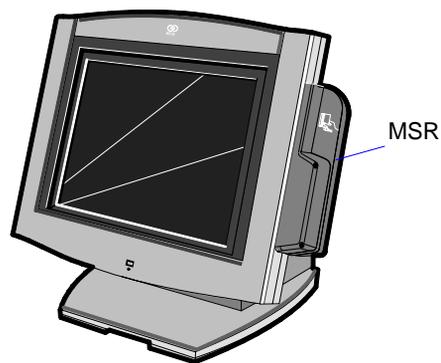
Printer Options

The sections that follow provide an illustration and brief description of the available printer options.

2214 Printer

The 2214 Printer is a thermal fiscal printer that can issue tickets and produce a journal. Its power cord plugs into a 120 VAC power source and the included RS-232 cable connects the printer's serial connector to the workstation.

18541
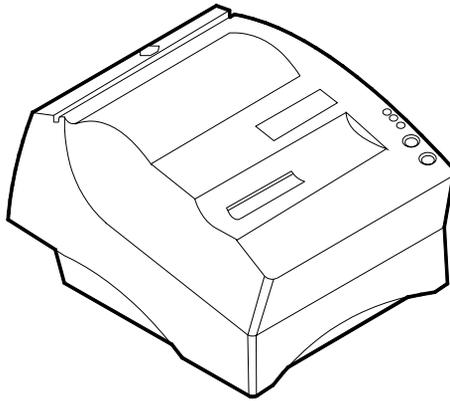
7158 Printer

The 7158 Printer is extremely fast, quiet, and reliable point-of-sale device. It consists of two specialized printers in one compact package: a thermal printer on top that prints receipts, and an impact slip printer in front to print on forms and checks that you insert. It receives its power from an external power supply, can be connected through a USB or serial port, and has a connector for cash drawers.
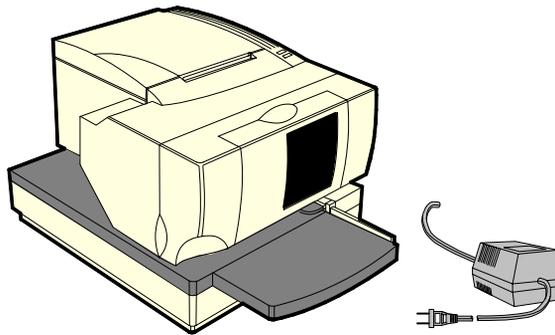
17304c

7166 Printer

The 7166 Printer is an extremely fast, quiet, and reliable point-of-sale printer. It consists of two specialized printers in one compact package: a thermal printer that prints receipts, and an impact slip printer. It receives its power from an external power supply, has a serial interface and a connector for cash drawers.
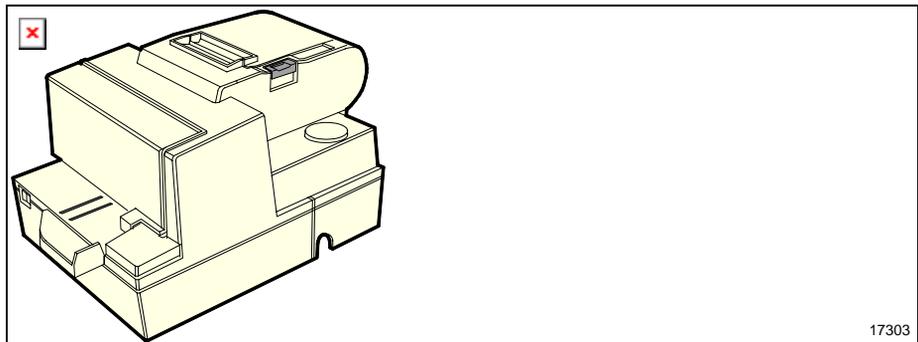
17303

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 it is kept electronically by the host terminal. The printer features a dual interface, so it can connect to the host terminal either through a USB or RS-232 connector. It receives its power from an external power supply, and has a connector for cash drawers.
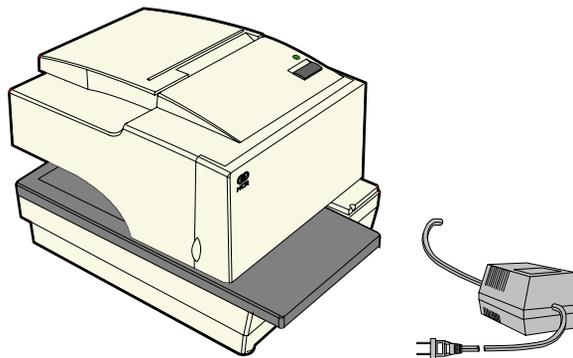
19711e

7194 Printer
The 7194 Printer is a high speed, high-resolution printer, capable of both text and graphics printing. It offers direct thermal printing in a receipt station. It receives its power from an external power supply, can be connected through a USB or serial connector, and has a connector for cash drawers.
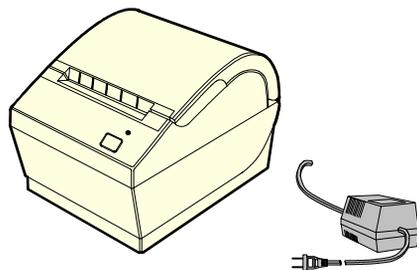
16437

7196 Printer

The 7196 Printer is a high speed, high-resolution printer, capable of both text and graphics printing. It receives its power from an external power supply, has a serial interface and a connector for cash drawers.
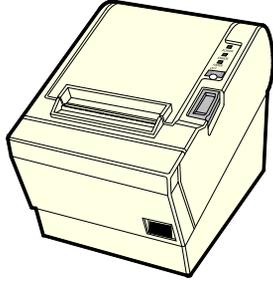
17302

7197 Printer

The NCR 7197 Printer is a fast, quiet, relatively small and very reliable multi-function printer. It prints receipts and two-color printing. The printer features a dual interface, so it can connect to the host terminal either through a USB or RS-232 connector. It receives its power from an external power supply, and has a connector for cash drawers.
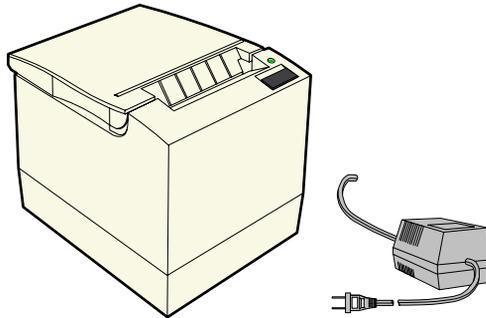
19712e

Other Integrated Devices and Indicators

Hard Disk Drive

A 2.5" IDE hard disk is available. The drive is the standard type that is used by notebook PCs.

Reset Switch

The Reset Switch is provided as a last resort to reboot the system if the software reset port mechanisms fail. This switch is located on the row of connectors that are located at the bottom of the enclosure. Although not intended to be easily accessible, the reset switch can be operated without removing covers or using any special tools.
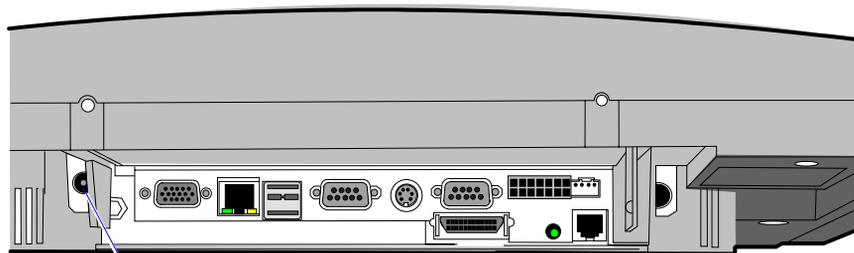
Reset Switch

16454

Reset Procedure
1. Press the Reset Switch and hold it in for more than 4 seconds. The screen goes blank.

2. Press the Reset Switch again. The system then reboots.

Internal Speaker

The Internal Speaker is connected to the PC speaker output of the system chipset, not to the audio subsystem. It is connected to the Processor Board via a harness and mounted inside the Processor Board enclosure.

POS Connector Board

The POS Connector Board is a small daughter board that mounts directly on the Cash Drawer and Parallel Port header. Connectors on the edge of this board form a second connector row above the Processor Board connectors. Connectors are available for two cash drawers, a customer display and a microphone.

Power for the cash drawers (24 V) and VFD customer display (5 V and 12 V) is supplied by the Enhanced Power Supply through the parallel connector.

Motion Sensor

The terminal hardware can detect movement near the terminal and enables software to prompt system operation from a low-power state. Application software may also be able to make use of motion detection when in the ON state if it is enabled by lower-level software.

Motion Sensor
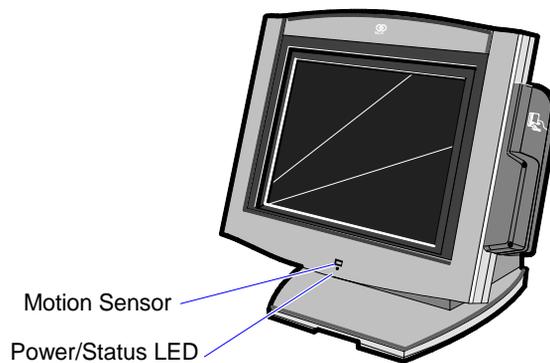
Power/Status LED

18287

Motion is detected as a change in ambient light level that is greater than a software-controlled threshold.

A photodiode mounted behind the front bezel of the unit senses ambient light levels. The photodiode resides on a small circuit board (the Motion Sensor Board). A harness connects the Motion Sensor Board to the amplifier and motion sensing logic on the Processor Board. The user Power/Status LED indicator shares this board.

Power/Status LED

The LED power indicator indicates that power is present. The LED is green when the processor and BIOS are operating properly. The LED is mounted behind the front bezel on the same board as the motion sensor.

Power OK LED

The Power OK LED is located behind the Cable Cover, between the Customer Display and Cash Drawer connectors.

Power OK LED
(5V and 24V)

16453

LAN Status LEDs

LAN Integrity
(Green)

LAN Speed:
Yellow = 100 MB
OFF = 10 MB

16455

Power Supply

The terminal uses an AC adapter for its power supply, concealed in the terminal mounting. The supply is inaccessible when the terminal is in the normal operation and mounting position to prevent tampering, and sealed to help protect against spills or other environmental hazards.

Note: The power supply automatically senses the proper AC voltage; therefore only normal servicing access is required.

All power required to operate the base unit, PCMCIA option and PCMCIA cards, speaker option, scanner option, and bus-powered USB peripherals is provided by the power supply.

The Processor Board serves as the hub to distribute power to all terminal functions. Cash drawers, VFD customer display, PS/2 keyboard, PCMCIA daughter board and slots, scanner (through RS-232 port), USB, hard disk, and the LCD all receive power through their respective Processor Board connectors.

Integrated Speaker Module (Optional)

The Integrated Speaker feature provides two stereo speakers that attach to the bottom of the Core Module. The maximum output of the speakers is approximately 6 watts per channel.

USB RS-232 Port Server

The USB RS-232 Port Server is an intelligent, stackable expansion module that connects to the terminal Universal Serial Bus (USB) port, providing high-speed RS-232 serial ports.

7454/7401
USB Port

RS-232 Ports

16944
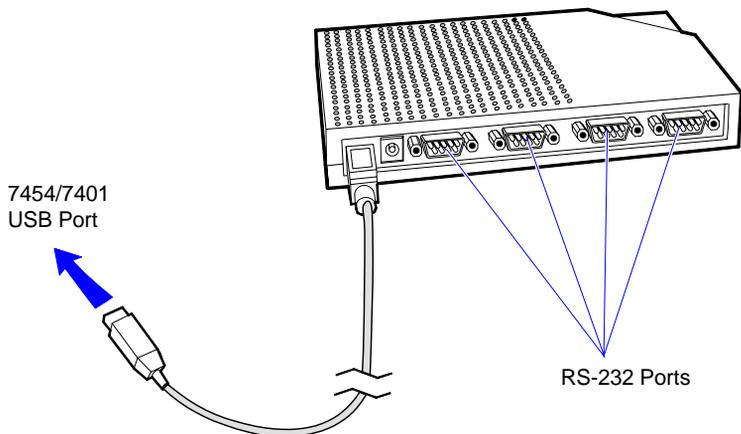
Additional Pentium III and Celeron Connectors

The Pentium III and Celeron board has an IRDA connector that is not on the Pentium board. It is not used at this time.

A connector can be added on Pentium III and Celeron models to add two additional RS-232 ports. To add the ports, install the *Dual RS-232 Port Kit* (7454-F072) as described in the Feature Kits appendix.

The following illustration shows the RS-232 Connector, which is part of the Dual RS-232 Port Kit, installed on the Connector Row Bracket.

RS-232 Connector
(COM 3 and COM 4)

IRDA
(Not used)
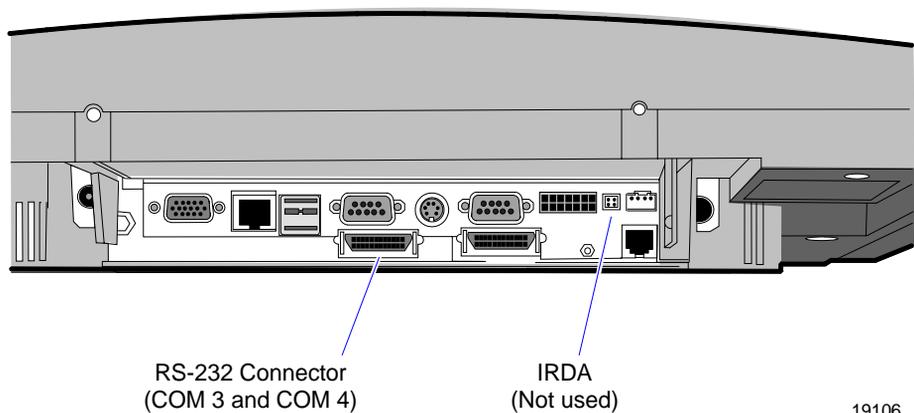
19106

The Dual RS-232 Port Kit also includes the Dual RS-232 Cable. When this cable is plugged into the Interface Cable Connector, the two additional serial ports are available.
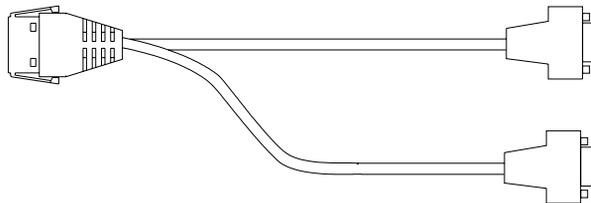
18002

Chapter 2: Hardware Installation

Introduction

The terminal is fully assembled at the factory. This chapter explains the mounting options and how to connect optional hardware components to the terminal.

Installation Summary

The terminal should be removed from the shipping packaging and visual checks made to verify the correct hardware configuration. The system is then configured and any communication cables are connected.

Only after inspection should the power cord be attached to the system and then connected to the AC power source. Power-up self-tests will run to verify basic functionality.

ROM-based setup should be used to configure network options. Full configuration depends upon the system server and the management Web site.

Installation Restrictions

- Before installing the terminal, read and follow the guidelines in the *NCR 7454 Retail Terminal Site Preparation Guide* and the *NCR Workstation and Peripheral AC Wiring Guide*.

- Install the terminal 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 terminal 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 terminal.

- If the power cord is replaced, it must be replaced with the same type of cord with the protective shroud.

- Do not route the power cord through openings with sharp edges.

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 connected to AC power. This can result in system or printer damage.

Warning: The 7454 must be mounted securely to prevent a hazard. It must be installed in accordance with local building codes. The post or wall on which the unit is mounted should be able to withstand four times the weight of the unit, which is approximately 20 lbs. (9 kg).

Connecting the Cables

Tilt Mount cable connectors are located on the underside of the Core Module, under a cable cover.

Accessing the Cable Connectors

1. Tilt the display to access the cable connectors.

Cable Cover
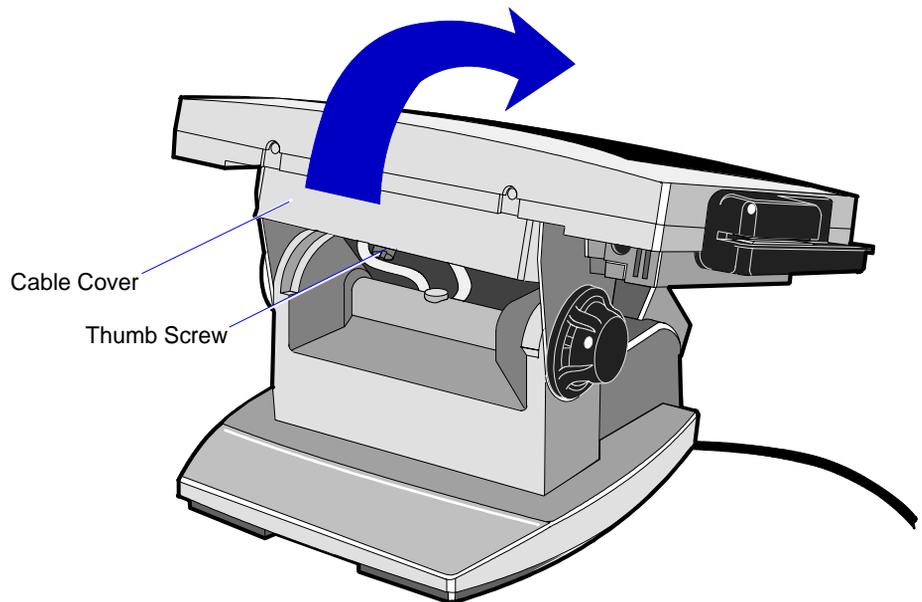
Thumb Screw

15968

2. Loosen the thumbscrew that secures the Cable Cover and remove the cover.

Routing the Cables

The 7454 has three places to secure cables to the base of the unit by using a cable tie wrap. Remove the power supply cover or customer display from the base of the unit, two thumb screws on bottom rear, and use a tie wrap to secure the Ethernet cable to one of the provided molded cable tie holders on the base. This should provide sufficient strain relief to prevent the cable from becoming tight and damaging the connector on the Processor Board.

The peripheral cables are routed down through the Mount Assembly and out the rear of the unit.

Bottom View

16413a
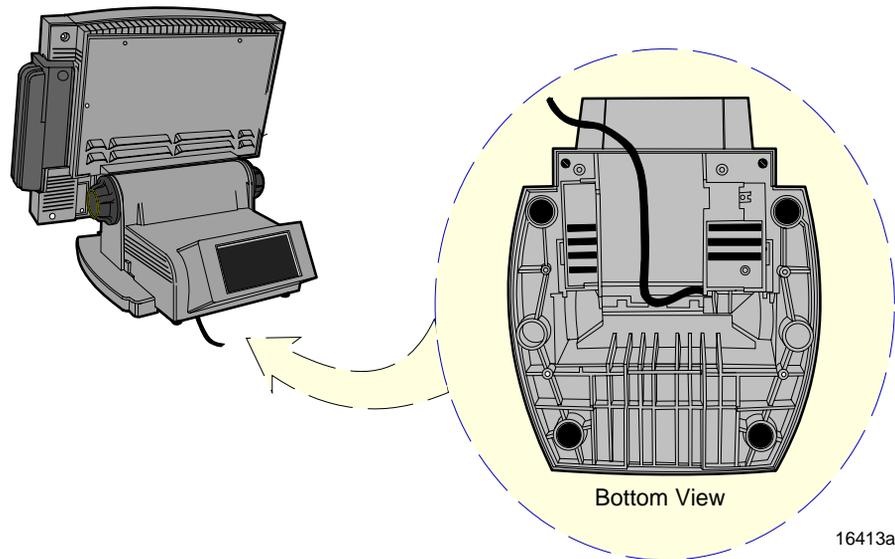
Identifying the Cable Connectors

The following illustration identifies each of the cable connectors. Refer to the sections following the illustration for specific instructions on installing each peripheral. After installing the peripheral and LAN cables, replace the cable cover and tighten the thumbscrew.
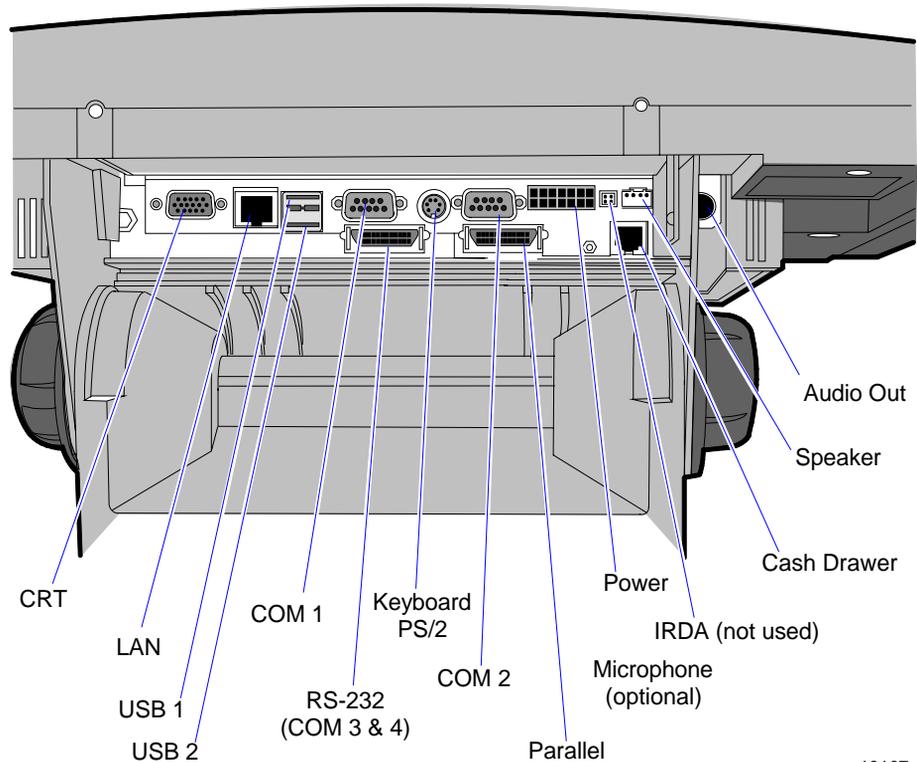
Note: COM1 and COM3 are powered ports.

Note: The COM3 & COM4 RS-232 ports require the *Dual RS-232 Port Kit* (7454-F072) feature

Installing Peripherals

This section describes how to install transaction printers and other peripherals on the 7454 terminal.

Installing a Transaction Printer

Transaction printers can connect through a non-powered RS-232 or USB connector as defined in the table below. Each printer except the 2214 requires an external power supply. The illustrations show how to connect to the 7194 printer. Connecting to the other printers is done in the same manner. Refer to the corresponding printer owner's manual for illustrations of the connector locations.

Printer Type	RS-232	USB
2214 Thermal Fiscal	√	
7158 Thermal Receipt/Impact Slip	√	√
7166 Thermal Receipt/Impact Slip	√	
7167 Thermal Receipt/Impact Slip	√	√
7194 Thermal Receipt	√	√
7196 Thermal Receipt	√	
7197 Thermal Receipt	√	√

Owner's Manuals/Guides

- *NCR 7158 Thermal Receipt/Impact Printer Owner's Guide* (B005-0000-1112)

- *NCR 7166 Multifunction Printer Setup & User's Guide* (B005-0000-1002)

- *NCR RealPOS 7167 Two-Station POS Printer Owner's Manual* (B005-0000-1406)

- *NCR 7194 Thermal Receipt Printer Owner's Guide* (B005-0000-1097)

- *NCR 7196 Thermal Receipt Printer Operator Manual* (B005-0000-1171)

- *NCR RealPOS 7197 Receipt Printer Owner's Manual* (B005-0000-1409)

RS-232 Installation

1. Connect the Printer Interface Cable to the *RS-232 Connector* on the back or on the bottom of the printer.

Cash Drawer Connector

Power Connector
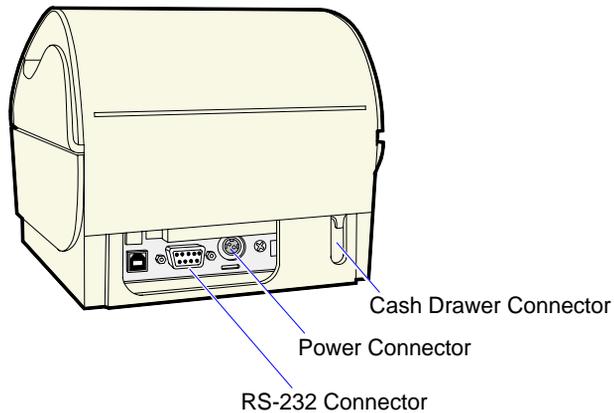
RS-232 Connector

16632a

2. Connect the other end of the printer cable to one of the RS-232 (non-powered) ports on the terminal.

3. Connect the external power supply cable to the *Power Connector* on the printer.

4. Plug the external power supply AC cable into an AC outlet.

USB Installation

1. Connect the Printer Interface Cable to the *USB Connector* on the back or on the bottom of the printer.

Cash Drawer Connector

Power Connector
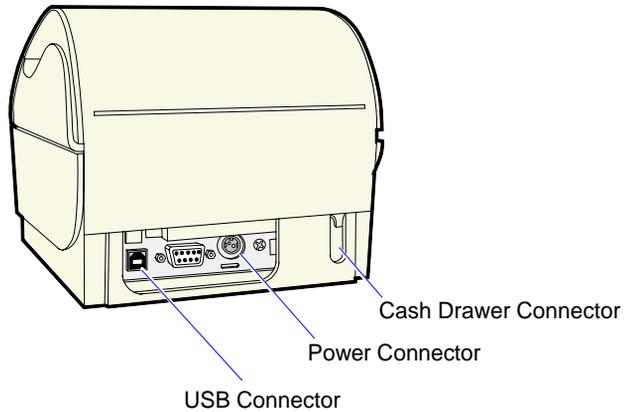
USB Connector

16632b

2. Connect the other end of the printer cable to one of the USB connectors (USB 1 or USB 2) on the terminal.

3. Connect the external power supply cable to the *Power Connector* on the printer.

4. Plug the external power supply AC cable into an AC outlet.

2214 Printer

1. Connect the Printer Interface Cable to the *RS-232 Connector* on the back of the printer.
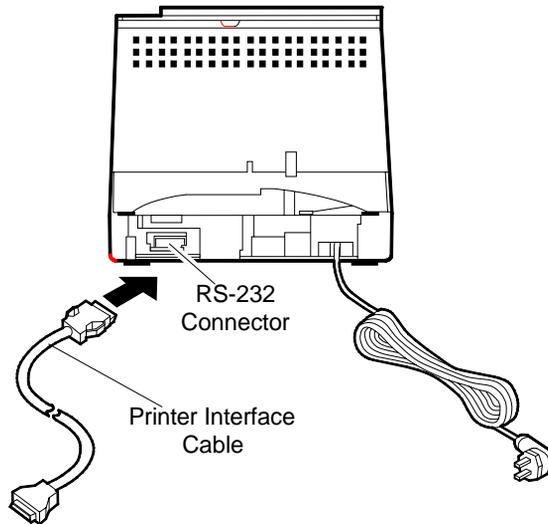
18543

2. Connect the other end of the Printer Interface Cable to an RS-232 port (non-powered) on the terminal.

3. Plug the Power Cord into an AC outlet.

Installing a Remote Customer Display

The terminal supports three high-post remote customer displays. The mounting configuration is the same and appearance is similar:

- 5974 Remote Customer Display (4x20 characters, VFD)

- 5972-1000 Remote Customer Display (2x20 characters, VFD)

- 5973 International VFD Customer Display

5974 Remote Customer Display
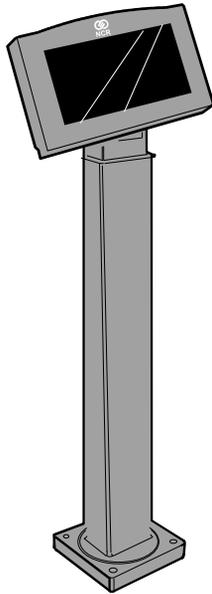
16670

1. Place the Display Mount on the desired surface within or 4 meters (13 feet) of the host terminal.

2. Determine if the cable should be routed down through the mounting surface or if it should be run on top of the surface.

3. Secure the Mounting Plate with 4 screws provided.
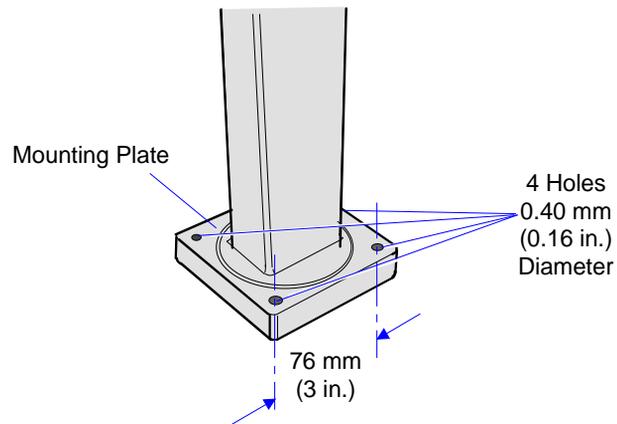
16671

4. Connect the Display Cable to the Customer Display port on the terminal.
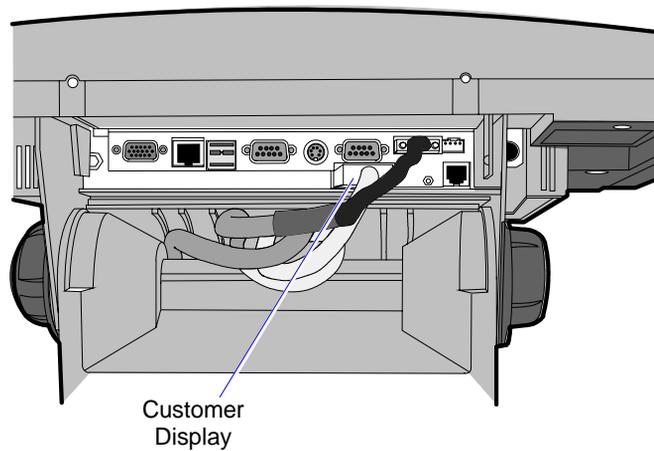
15969b

5972-1100 Remote Customer Display
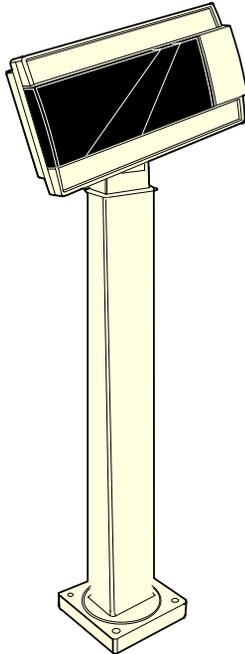
16257

1. Place the Display Mount on the desired surface within 4 meters (13 feet) of the host terminal.

2. Determine if the cable should be routed down through the mounting surface or if it should be run on top of the surface.

3. Secure the Mounting Plate with 4 screws provided.

Mounting Plate

4 Holes
0.40 mm
(0.16 in.)
Diameter

76 mm
(3 in.)
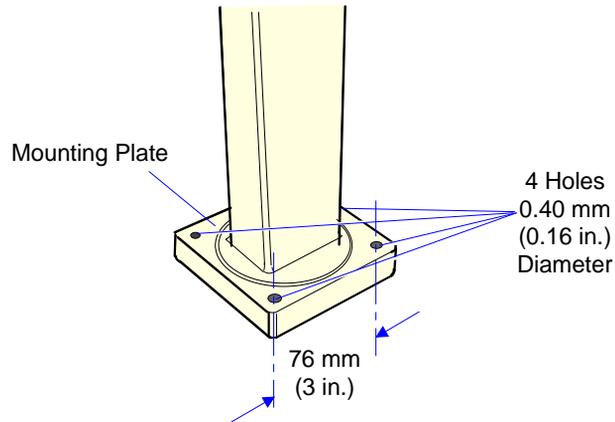
16258

4. Connect the 5972 Display Cable to the Parallel I/F Adapter Cable.

5972 Display Cable
497-0405676 - 4 M
1416-C278-0040

Parallel I/F Adapter Cable
497-0411000 - 0.6 M
1416-C472-0006

Customer
Display

Power
Brick

7454 Cust.
Display Port
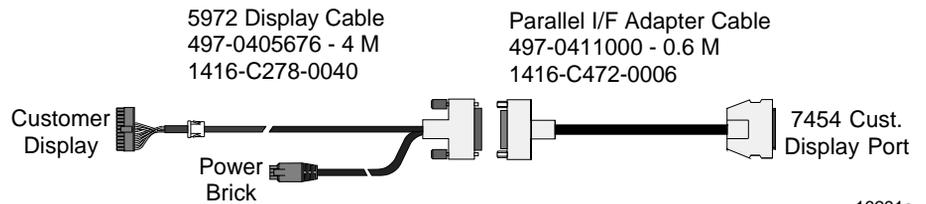
16291a

5. Connect the Parallel I/F Adapter Cable to the Customer Display
    port on the terminal.
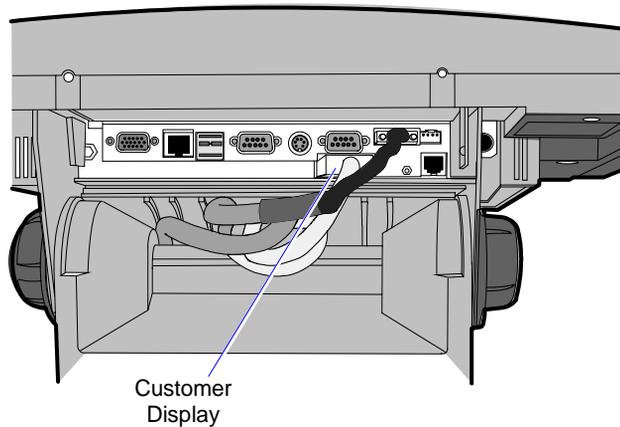
Customer
Display

15969b

6. Connect the 5972 Display Cable Power Brick connector to the Power Brick cable.

7. Plug the Power Brick into an AC outlet.

5973 International VFD Customer Display

(4) Screws
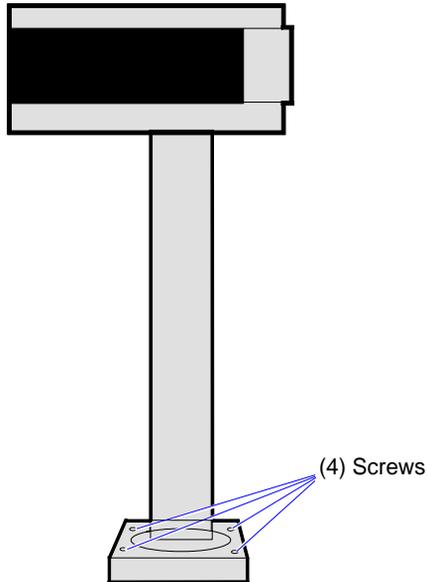
14528

1. Place the Display Mount on the desired surface within 4 meters (13 feet) of the host terminal.

2. Determine if the cable should be routed down through the mounting surface or if it should be run on top of the surface.

2. Secure the Mounting Plate with 4 screws provided.

Mounting Plate

4 Holes
0.40 mm
(0.16 in.)
Diameter

76 mm
(3 in.)
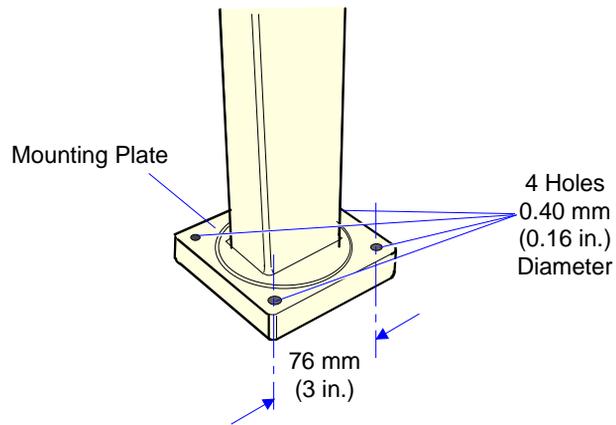
16258

3. Connect the 5973 Parallel Cable to the Customer Display port on the terminal.
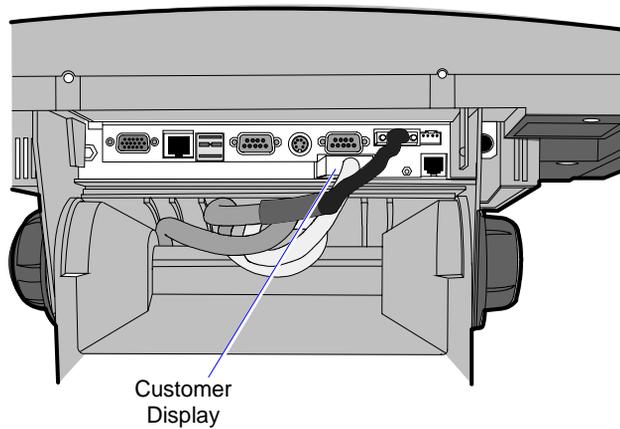
Customer
Display

15969b

Installing a High-Post Integrated Customer Display

The 7454 Integrated Customer Display supports four lines of twenty 5x7 characters. This is the same display module that is used with the low-profile integrated display.

NCR 4 x 20 Customer Display Up to four lines of twenty 5x7 characters are supported

16713
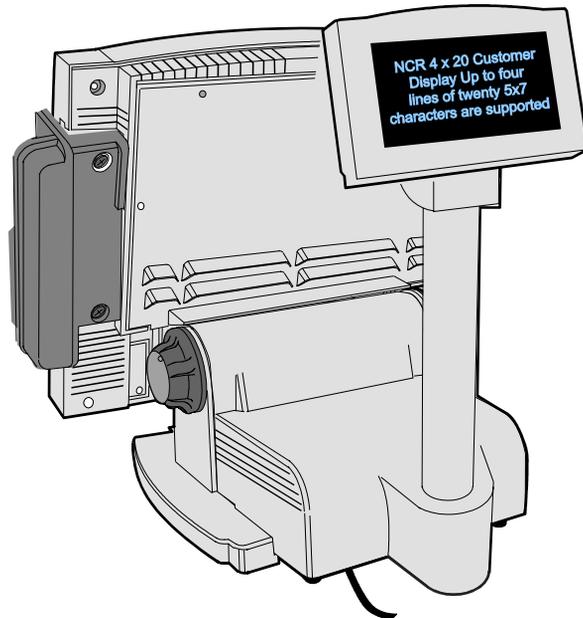
Installing an Integrated Customer Display
(5972-F039)

The standard Power Supply Cover on the 5953-F022 Remote Table Top Mount does not support attachment of an integrated NCR 7454 4 x 20 Customer Display. In order to mount an integrated display you need to install 5972-F039, which includes:

1. Power Supply Cover

2. 12-inch Integrated Display Post

3. Top Bracket.

4. Nylon Hole Plug

19726b
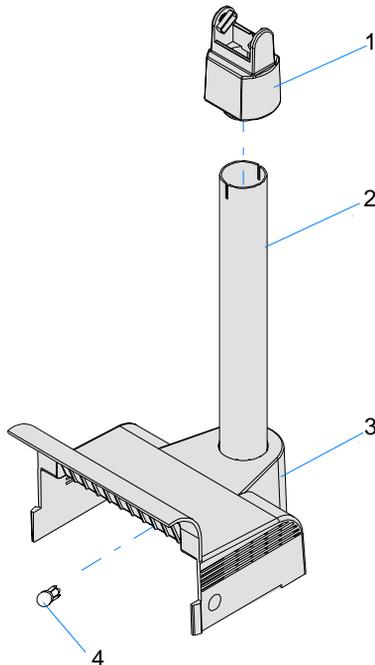
Installation Procedure

1. Route the cable (display connector end) up through the Power Supply Cover, Display Post, and Top Bracket. This is a tight fit and the connector has to be angled in order to make it though the openings. Use care to not damage the wires.

Top Bracket

Display Post

Power Supply Cover

4 x 20 Integrated High-Post Cable
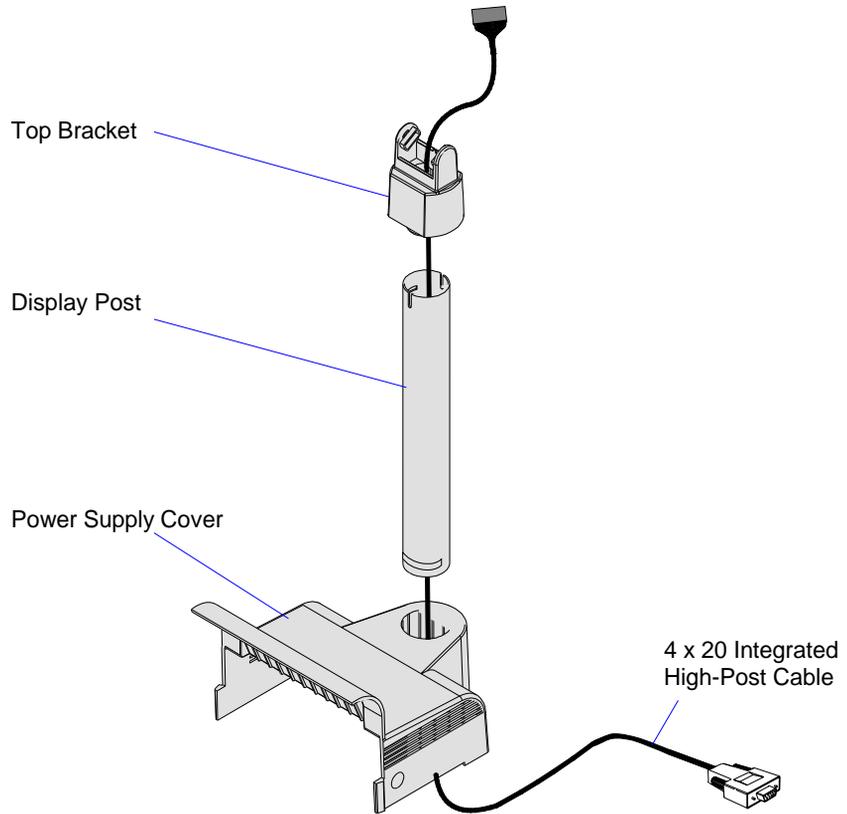
19949a

2. Insert the post into the hole on the top of the Power Supply Cover. Note the orientation above. The slot on the bottom end of the post should face the inside of the cover.

3. Install the Top Bracket onto the post.

4. Connect the cable to the

   a) Remove the Integrated Display Bracket (2 screws).

   b) Connect the cable to the 2 x 20 VFD Assembly.

   c) Replace the Integrated Display Bracket.

4 x 20 VFD Assembly   Integrated Display Bracket   Phillips PH Screw (4-24 x 0.625)
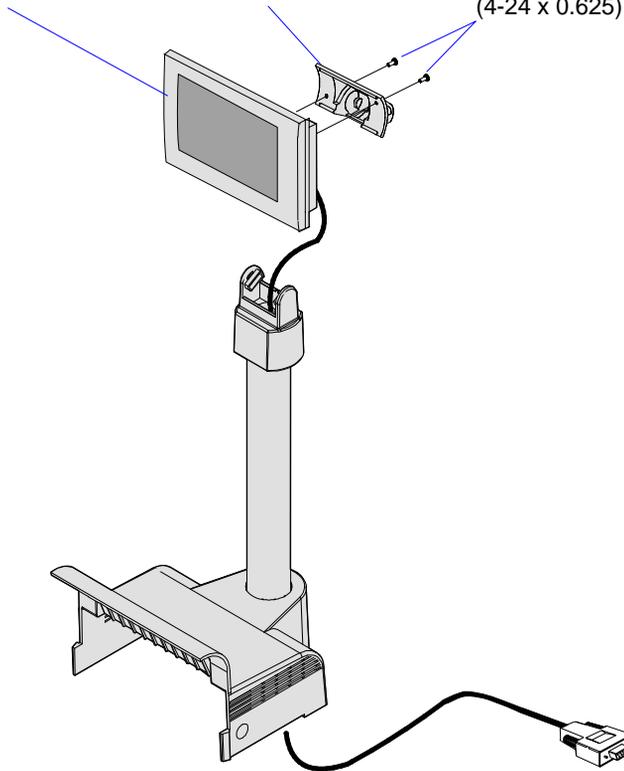
19948a

5. Install the Display Assembly onto the Top Bracket.

6. Install the Nylon Hole Plug in the Power Supply Cover, locking the post in place. The slot permits the display to be rotated to personal preference.

Nylon Hole Plug

7454 Customer
Display Connector

16948
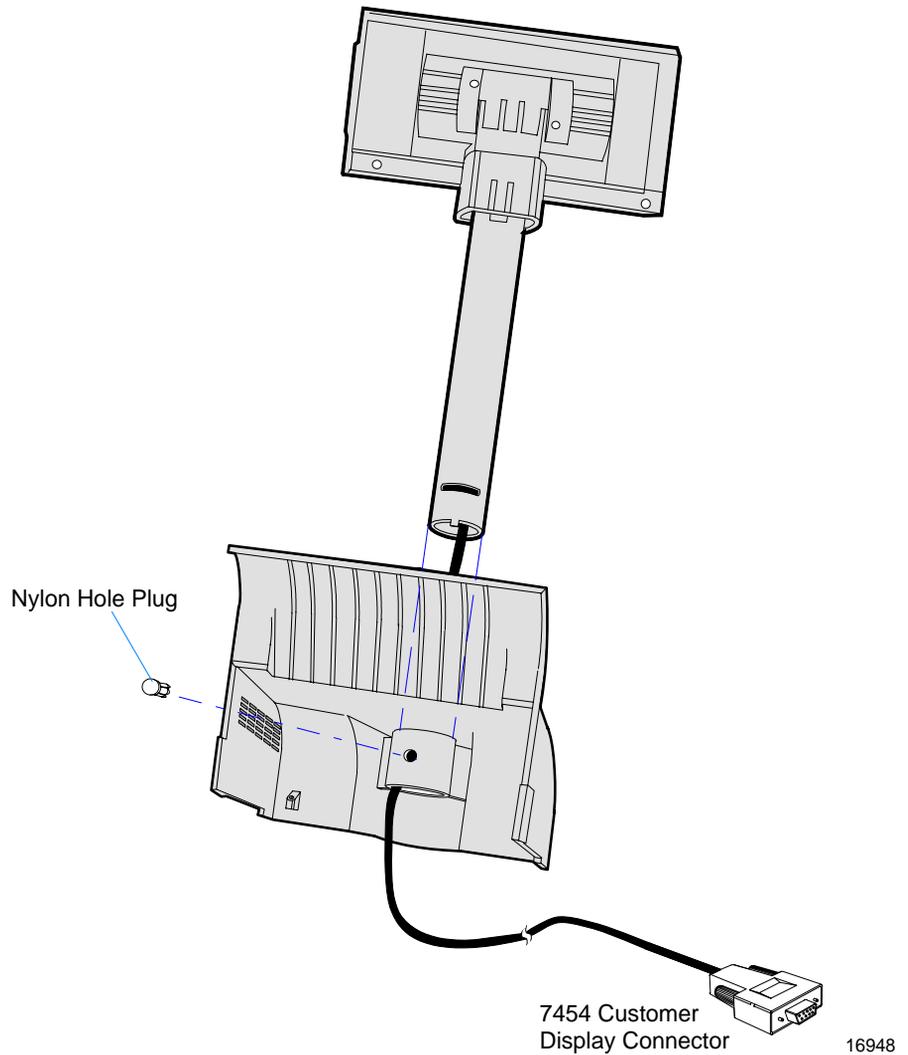
7. Remove the Power Supply Cover from the 7454 unit.

a) Remove the screws (2) that secure the cover.

b) Press in on both sides of the cover and lift it up in the back to remove it.

Press in on Both Sides   Screws (2)
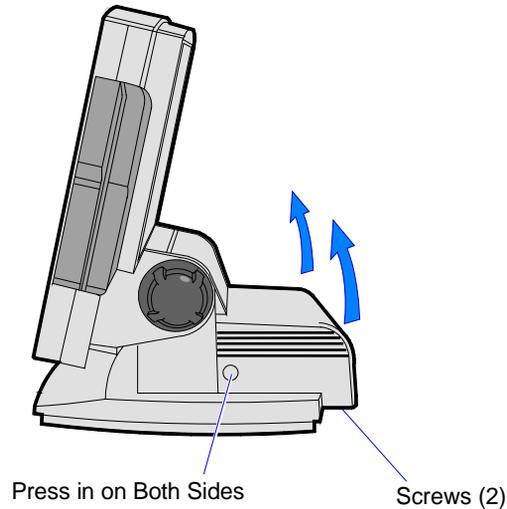
20049

8. Install the Customer Display and Cover assembly onto the 7454 (2 screws).

NCR 4 x 20 Customer
Display Up to four
lines of twenty 5x7
characters are supported
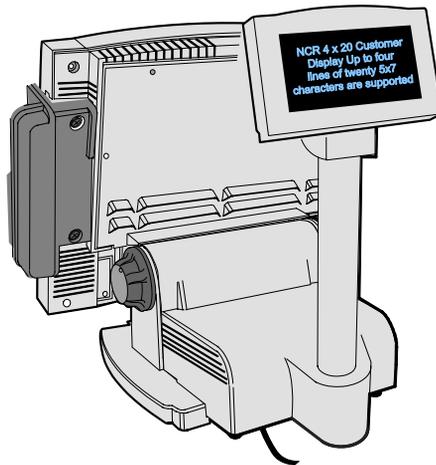
16713

9. Connect the Display Cable to the Customer Display connector on the terminal.

Installing a Cash Drawer

1. Place the cash drawer in the desired location, within cable length of the terminal.
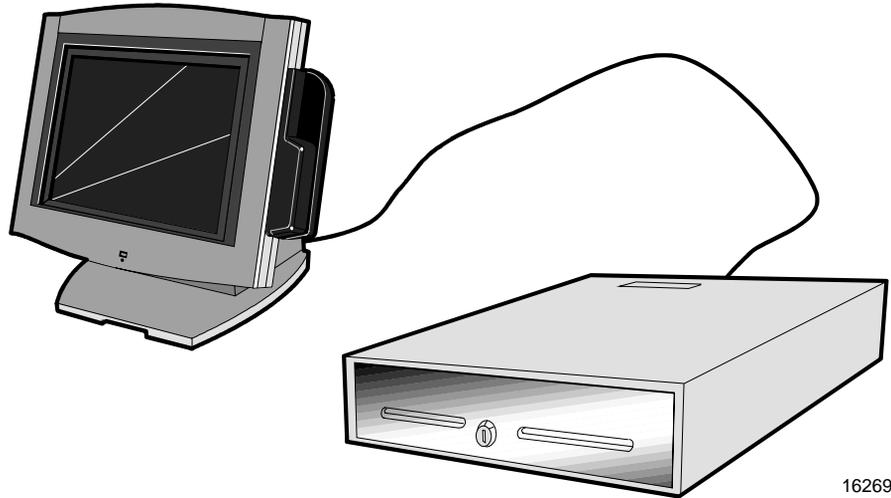
16269

2. Connect the cash drawer cable to the terminal cash drawer connector.
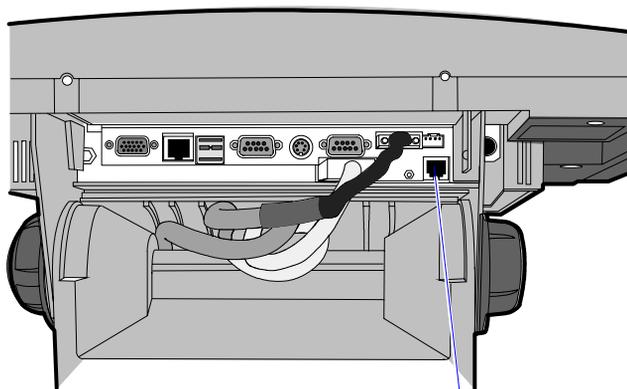
Cash Drawer

15969c

Note: The Cash Drawer can optionally be connected to the printer.

Installing a Second Cash Drawer

The terminal supports a 2-drawer configuration with a Y-cable
(1416-C372-0006).

1. Place the cash drawer in the desired location, within cable length of
    the terminal.

2. Connect the Y-cable to the terminal cash drawer connector.

Dual Cash Drawer Y-Cable
1416-C372-0006
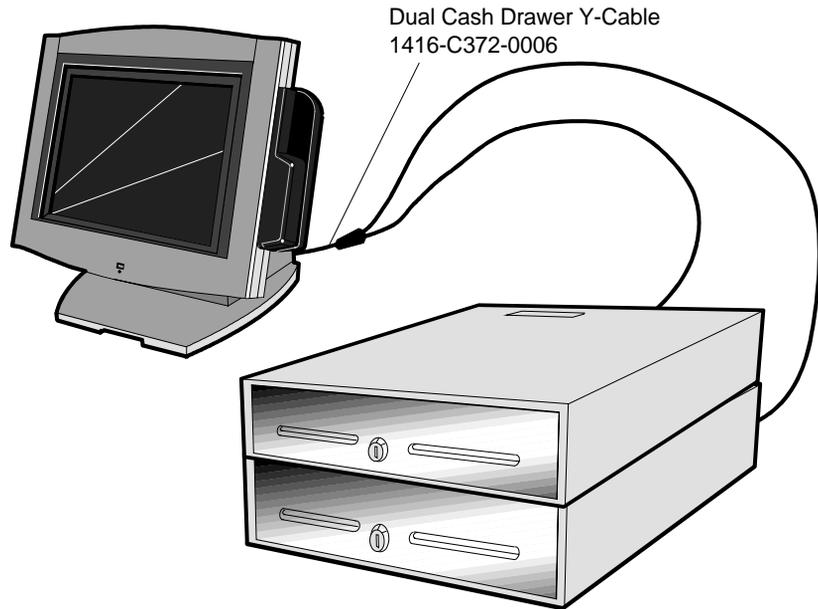
16270

Note: The Y-cable can optionally be connected to the printer.

Mounting the 7454

A Tilt Mount terminal can be installed on a flat horizontal surface or a flat vertical surface.
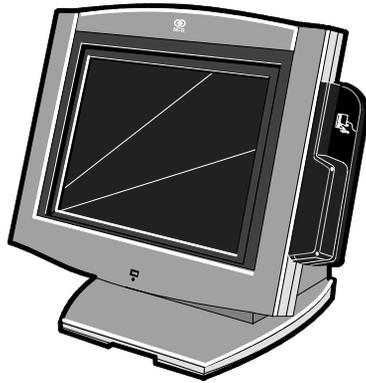
Table-Top Mount   Wall Mount

16429
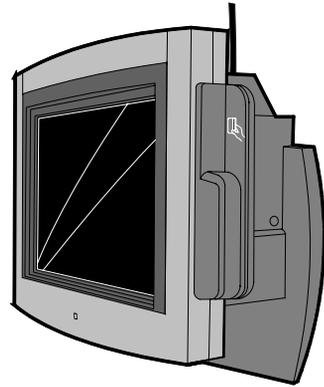
Wall Mounting a Tilt Mount

To install the Tilt Mount on a flat vertical surface, use the K533 Wall Mount Bracket Kit.

1. Secure the Wall Plate to the wall with lag screws (4) into the studs or with hardware of similar strength. The recommended viewing height for the terminal is 1.2 m (48") from the floor.

Wall Mount Adapter Plate

Release Lever
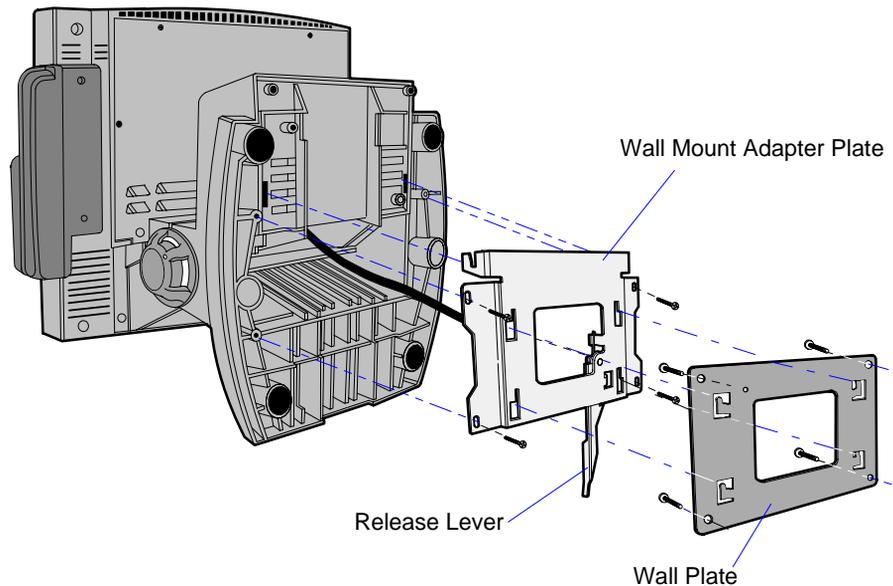
Wall Plate

16400

2. Install the Wall Mount Adapter Plate to the bottom of the terminal with screws (4).

3. Install the terminal to the Wall Plate. The bottom of the Wall Mount Adapter Plate has slots that mate to locking tabs on the Wall Plate.

4. Latch the Release Lever.

Finalizing the Installation

After the hardware installation has been completed, the terminal can be powered up to finalize the installation. The operating system, along with platform modifications, is pre-installed. The following sections list the steps involved to complete the system installation for each of the Gold Disk operating systems.

Completing the OS Installation (Win2000)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, it will perform a disk check and then continue with the Windows 2000 installation.

2. Enter the *User Name* and *Organization*.

3. Enter the *Computer Name* for the client.

4. Enter the *Administrator's Account Password* (optional)

5. When prompted, press *Finish* to reboot the client.

6. Login when prompted.

7. Run the MicroTouch screen calibration from the Desktop icon.

Completing the OS Installation (WinXPe)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. Click the Admin button to login as Administrator.

2. Read the EULA (End-User License Agreement) information in the DOS window, then type **EXIT** and press **Enter** to close the DOS window.

3. Start the Network Setup Wizard.

4. Select options to identify the network information for the terminal environment.

5. Enter the *Computer Description*.

6. Enter the *Computer Name*.

7. Enter the *Workgroup Name*.

8. When prompted, press *Finish* to reboot the terminal.

9. Log in when prompted.

1. Open the Control Panel or use the TouchWare Icon on the desktop and run the MicroTouch screen calibration.

Completing the OS Installation (WinNT)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, press *Next* at the Windows Setup screen.

2. Accept the Microsoft license agreement.

3. Enter the *User Name* and *Organization*.

4. Enter the *Computer Name* for the client.

5. Enter the *Administrator's Account Password* (optional).

6. When prompted, press *Finish* to reboot the client.

7. Log in when prompted.

8. Open the Control Panel and run the MicroTouch screen calibration.

Completing the OS Installation (Win98)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. When the terminal boots it enters the Windows setup routine.

   Note: When installing Win98 on terminals with early Processor Boards (7454-22xx) there are few differences in the procedure as follows:

   a) The terminal starts the *Add New Hardware Wizard*.

   b) For each device found, permit Windows to search for new drivers (take defaults).

   c) After each driver is installed you are asked to reboot. Answer **No**.

2. At the **User Information** screen, enter the *User* information. This can be done using a keyboard or you can use the touch screen keyboard. After entering the information, press **Enter** or touch **OK**.

3. Go into the Control Panel and set the terminal Date and Time.

4. In the Control Panel, run the MicroTouch screen calibration.

Completing the OS Installation (Win95)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, press *Next* at the Windows Setup screen.

2. At the **User Information** screen, enter the *User* information. This can be done using a keyboard or you can use the touch screen keyboard. After entering the information, press **Enter** or touch **OK**.

3. Run the MicroTouch screen calibration as described later in this chapter.

Completing the OS Installation (DOS)

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

Setting Auto-Logon (WinNT Terminal)

Since the client does not have a keyboard it is desirous to have it logon automatically.

1. Create a default user account that you want to use to logon to the client(s).

    a) Open the User Manager. Select the Windows **Start** button, select **Programs**, **Administrative Tools (Common),** and then Select **User Manager**.

    b) Select the **User** menu and then select **New User**. Give the account a password (mandatory). As an extra precaution set the password never expires and that the user can not change it.
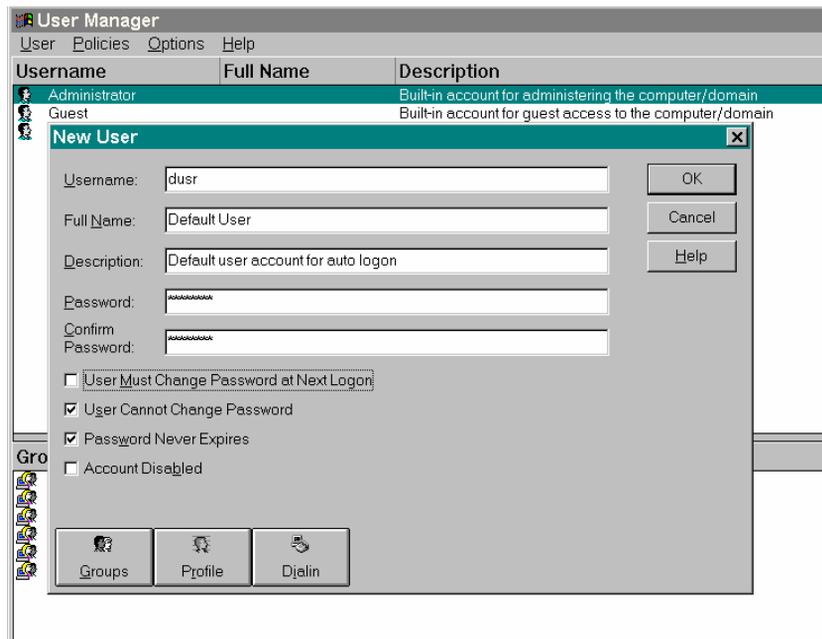
    c) Select **Groups** to modify the new user's group memberships.

d) Add the new user to the **Administrators** group. **You need to do this in order to be able to later turn off the auto-logon function.**
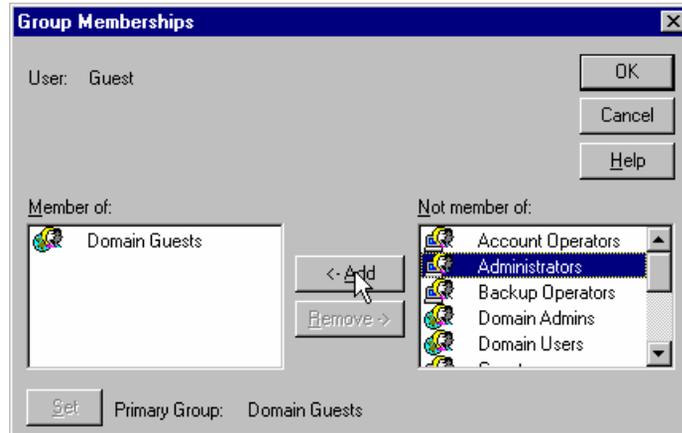
e) Select **OK** to close the Group Membership box.

f) Select **OK** to create the account.

2. Modify the Registry. Select the Windows **Start** button and select **Run**.

3. Enter regedit and then select **OK**.

4. Open the following registry subkey:

```
HKEY_LOCAL_MACHINE\Software\Microsoft\WindowsNT\
CurrentVersion\Winlogon
```

5. Create a new string value to permit auto logon for the default user. Select the **Edit** menu, select **New** and then select **String Value**.
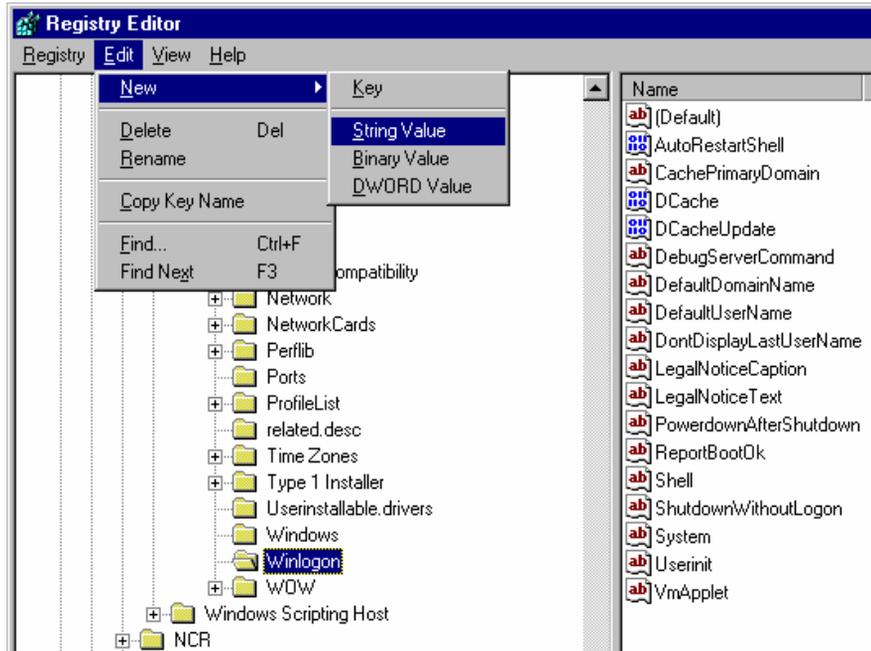
6. Name the new entry **AutoAdminLogon**.
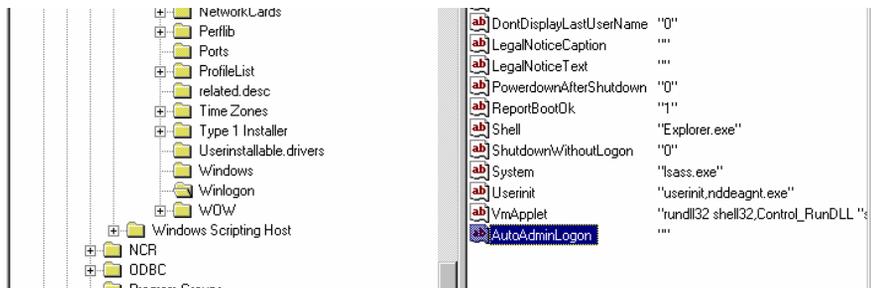
7. Edit the string value. With the new entry selected, select the **Edit**
    menu and then select **Modify**. Enter the value 1 for auto-logon. A
    value of 0 sets it to no auto-logon.
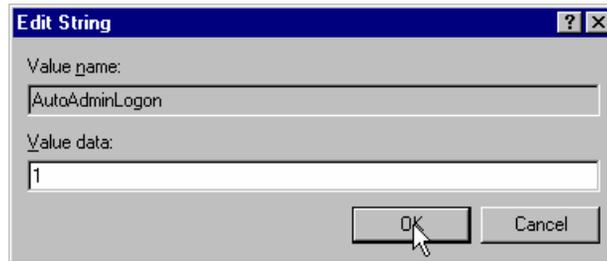
8. Select **OK** to set the value.

9. Modify the *DefaulUserName* to contain the user ID that you want to
    automatically logon. With the *DefaulUserName* selected, select the
    Edit menu and then select **Modify**. Enter the user ID.
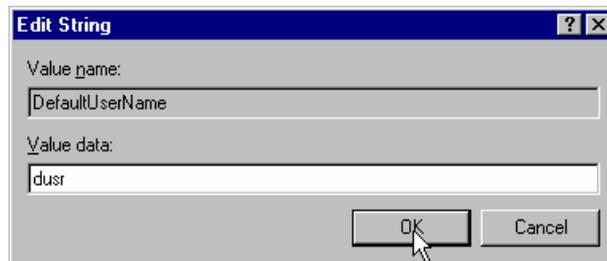
10. Select **OK** to set the value.

11. Create a new string value to contain the password for the default user. Select the **Edit** menu, select **New** and then select **String Value**.

12. Name the new entry **DefaultPassword**.
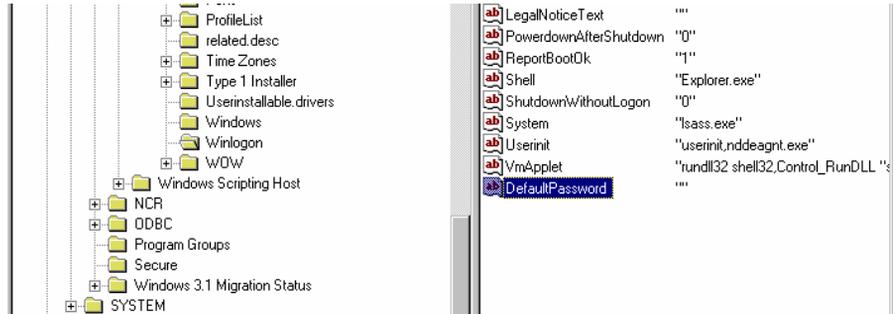
13. Edit the string value. With *DefaultPassword* selected, select the **Edit** menu and then select **Modify**. Enter the value of the password of the default user (from Step 1). The example below uses *password*.
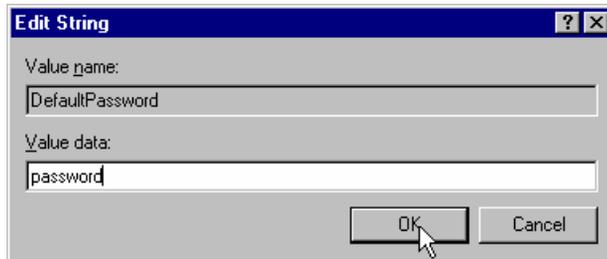
14. Select **OK** to set the value.

This completes the client installation.

To bypass auto logon, and to log on as a different user, hold down the SHIFT key after a logoff or after a Windows NT restart.

Installing a Serial Mouse

Follow these steps to install a Serial Mouse on the terminal.

1. Edit the `boot.ini` file, which is located in the root of the C drive.

    a. Open Windows NT Explorer

    b. Go to the **View** menu and select **Folder Options**.

    c. Select the **View** tab.

    d. Scroll down until you see a folder that is labeled **Hidden Files**. Make sure the button labeled **Show All Files** is selected and then select OK.

    e. Select the C drive root directory. Scroll down until you find the file named `boot.ini` and select it.

    f. Open the **File** menu and then select **Properties**.

    g. Uncheck the box labeled **Read Only** and then select **OK**.

    h. Open the `boot.ini` file with Notepad. It should have the following entries:

    ```
    [operating systems]
    multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows
    NT Workstation Version 4.00" /NoSerialMice

    multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows
    NT Workstation Version 4.00 [VGA mode]" /basevideo
    /sos
    ```

2. Delete the text `/NoSerialMice`. The file should now look like:

3. Save the file and then restart the terminal with the serial mouse connected.

After the terminal restarts it recognizes the mouse and installs the supporting drivers. The drivers are located on the hard drive at C:\install\i386. If for some reason they are not on the hard drive, connect the terminal to a network and share a CD-ROM drive with the NT Operating System disk installed, or copy the files needed to the network.

Guidelines for Calibrating the Touch Screen

The following guidelines should be observed for calibrating the touch screen.

- Calibration should be done at time of installation

- Recalibrate the touch screen when the system is installed at its final location.

- Recalibrate whenever the terminal is moved to a new location.

- Recalibrate the touch screen anytime the system has been disassembled for servicing.

- Only use the Microcal (DOS) program, the Touchware Control Panel (Windows), or Touchware icon on the Desktop (XPe) to calibrate the touch screen.

  Microcal:
  a. Set the video resolution. Go to the **Tools** menu, **Video**. Select **800 x 600 256 colors**.

  b. Go to the **Tools** menu, select **Calibrate**.

  Touchware Control Panel:
  a. Go to the **Calibrate** tab and press **Calibrate**.

Calibration Procedure

The calibration program looks at where your finger is when you lift it off the screen, not where you touch it. Therefore, calibrate the screen as follows:

1. Touch the screen near the calibration target.

2. Keep your finger on the screen and slide it to the center of the target.

3. Hold your finger firmly on the target for two seconds, then lift it off quickly.

4. Verify that the calibration was set accurately before making a service call. Perform the calibration again if necessary.

•   If cursor is not stable, or false touches are suspected, run the Noise Check Utility from the Touchware Control Panel (Windows) or from the Microcal (DOS) program. Choose the recommended frequency (the one with the lowest noise level). This should also be done if the touch screen is still not calibrated after one attempt to recalibrate it.

Microcal:

a. Set the video resolution. Go to the **Tools** menu, Video. Select **800 x 600 256 colors**.

b. Go to the **Tools** menu, select **Noise Check**.

c. Follow the instruction prompts. Choose the frequency with the lowest noise level.

Touchware Control Panel:

a. Go to the **Cursor** tab and press **Stabilize Cursor**.

b. Choose the recommended frequency.

•   The Edge Adjust should be turned off if using Windows.

Touchware Control Panel:

a. Go to the **Cursor** tab. **Edge Adjustment** should be turned off.

Application software can possibly generate a dialog box from the Touch Driver, with the message that the touch screen needs to be re-calibrated. If the screen appears to be working normally, then this message can be ignored. There is a check box labeled, `Do not show this message again`. Make sure this box is checked.

Summary

If there is a touch screen calibration issue during or after installation, take the following actions in the order listed:

1. Recalibrate.
2. If re-calibration is unsuccessful after two attempts, then run the Noise check to change the frequency.
3. If you are still not able to calibrate, change the touch screen glass.
4. The final step is to replace the Processor Board. If this corrects the problem, then the old glass is probably OK to reuse.

Out-of-Box Failures

The RSG-Atlanta Customer Satisfaction Hotline will replace <u>out-of-box</u> failed hard disks with identical, preloaded drives. Once a system is successfully installed, all disk contents are the responsibility of the customer. The customer is responsible for restoring operating system software and/or customer-specific data onto replacement disks sent to repair a failed or damaged disk in the field. NCR provides recovery tools for the operating system and platform software.

Chapter 3: Setup

Introduction

This chapter describes how to configure the BIOS CMOS options. Following this *Introduction*, there are sections specific to Pentium terminals and sections specific to Pentium III/Celeron terminals.

Note: An external alphanumeric keyboard is not required to run the BIOS CMOS Setup Utility, but a keyboard makes the setup easier.

BIOS Versions

The Setup Menus in this chapter reference NCR 7401/7454 BIOS Version 1.5.0.4 (Pentium) and NCR 7401/7452/7453/7454/7455 BIOS Version 2.1.2.x (Pentium III).

Entering Setup Without a Keyboard

1. Apply power to the terminal.

2. Calibrate the touch screen.

   a) When the screen prompt that says *Touch the screen two times to enter Setup* appears, touch the screen **three** times. This causes the system to bypass the BIOS Setup and go directly to the Touch Screen Calibration Setup.

   Note: Setup can also be entered from the Boot Menu that is displayed when you press **ESC** during POST.

b) As instructed on the screen, touch the circle near the lower-left corner of the screen. For best results, press the screen near the circle and then slide your finger onto the circle without raising your finger from the screen.

c) Using the same method as above, touch the circle near the upper-right corner of the screen.

You should receive a *Successful Calibration* message and then the *PhoenixBIOS Setup Utility* should come up.

d) Select the setup parameters by touching the controls at the bottom of the screen.

Entering Setup Using a Keyboard

1. Apply power to the terminal.

2. Press the F2 key when the message at the bottom of the screen prompts you to do so.

   Note: Setup can also be entered from the Boot Menu that is displayed when you press **ESC** during POST.

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 + and - (or F5 and F6) 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.

Note: If you are not using an external keyboard, you can touch the menu controls at the bottom of the screen. If you encounter difficulty doing this, recalibrate the screen.

Restoring Factory Settings

To automatically reset all values to their default settings for the *current screen*, press F9. The terminal will automatically load BIOS default CMOS values for boot up.

To reset *all* BIOS settings to their default settings go to the *Exit* menu, press F9, select either *Save Changes & Exit* or *Save Changes*, and press Enter.

Refer to the *BIOS Default CMOS Values* section later in this chapter for the pre-installed Setup defaults.

BIOS Default CMOS Values (Pentium)

The following are the BIOS default CMOS values for the terminal.

Note: When installing a new BIOS from the CD, the Processor Board type is automatically detected and the correct BIOS is automatically installed.

Main Values

System Time	(variable)
System Date	(variable)
Legacy Diskette A:	144 MV/1.25 MV, 3 ½"
Legacy Diskette B:	Disabled

IDE Primary Master	
Type	[Auto]
Cylinders	4191
Heads	16
Sectors/Track	63
Maximum Capacity	2163 MB
Multi-Sector Transfers	16 Sectors
LBA Mode Control	Enabled
32 Bit I/O	Disabled
Transfer Mode	Fast PIO 4
Ultra DMA Mode	Disabled

IDE Primary Slave	
Type	None

IDE Secondary Master	
Type	None

IDE Secondary Slave	
Type	None

Memory Cache	Enabled
Cache System BIOS area	Enabled
Cache Video BIOS area	Disabled

System Memory	640 K
Extended Memory	31744 K

Power Savings	Disabled
Standby Timeout	Off
Auto Suspend Timeout	Off

Fixed Disk	Disabled
Video	Disabled
IDE Drive 0 Monitoring	Disabled

IDE Drive 1 Monitoring	Disabled
IDE Drive 2 Monitoring	Disabled
IDE Drive 3 Monitoring	Disabled
PCI Bus Monitoring	Disabled
Boot sequence	
1. LANDesk® Service Agent II	
2. Hard Drive	
Continuous POST	Disabled

Advanced Values

I/O Device Configuration

Local Bus IDE adapter	Primary
Serial port A	Auto
Serial port B	Auto
Mode	Normal
Parallel port	Auto
Mode	Bi-directional
Floppy disk controller	Disabled
Disk-On-Chip Address	Disabled

MSR Address	Disabled
Plug and Play	No
Reset Configuration Data	No
PS/2 Mouse	Auto
Large Disk Access Mode	DOS
Secured Setup Configurations	No

PCI Configuration

ISA Graphics Device Installed	No
PCI/PNP ISA UMB Region Exclusion	Available (all)

Interrupts (Pentium)

The following table lists the default settings.

IRQ	System Resource
NMI	I/O Channel Check
0	Reserved, Interval Timer
1	Reserved, Keyboard buffer full
2	Reserved, Cascade interrupt
3	Serial Port 2
4	Serial Port 1
5	User available
6	Reserved, Floppy
7	Parallel Port 1
8	Real Time Clock
9	NCR Motion, Thermal interrupt
10	LAN
11	Windows Sound System/USB
12	Touch Screen
13	Reserved, Math coprocessor
14	On-board IDE (available if IDE is disabled)
15	MSR

Memory Map (Pentium)

The following table details the memory map for the Pentium processor. The ESCD area from ED000-EDFFF is not available for use as an Upper Memory Block (UMB) by memory managers. The area from E0000-EBFFF is currently not used by the BIOS and is available for use as UMB by memory managers. Parts of this area may be used by future versions of the BIOS to add increased functionality.

Address Range (hex)	Size	Description
FECFF000-FECFF01B	27	LAN PXE ROM
100000-10000000	255 MB	Extended memory
F0000-FFFFF	64 K	System BIOS
EE000-EFFFF	8 K	Main BIOS (available as UMB)
ED000-EDFFF	4 K	ESCD (plug and play configuration area)
EC000-ECFFF	4 K	OEM (available as UMB)
E0000-EBFFF	48 K	BIOS Reserved (currently available as UMB)
D0000-DFFFF	64 K	Available HI DOS memory
CE000-CFFFF	8 K	Flash Disk (optional)
CC000-CDFFF	8 K	NCR Trigantor MSR (optional)
C0000-CBFFF	48 K	Onboard video BIOS
A0000-BFFFF	128 K	Reserved for video memory
9FC00-9FFFF	1 K	Extended BIOS Data (moveable by QEMM, 386MAX)
80000-9FBFF	127 K	Extended conventional
00000-7FFFF	512 K	Conventional

BIOS Default CMOS Values (Pentium III/Celeron)

The following are the BIOS default CMOS values for the workstation.

Note: When installing a new BIOS from the CD, the Processor Board type is automatically detected and the correct BIOS is automatically installed.

Main Values

Note: An asterisk (*) indicates a variable value based on system specification, etc. .

System Time	*
System Date	*
Legacy Diskette A:	Disabled
Legacy Diskette B:	Disabled
Primary Master	2168 MB
Type	Auto
Cylinders	4200
Heads	16
Sectors	63
Maximum Capacity	2168 MB
Total Sectors	4233600
Maximum Capacity	2168MB
Multi-Sector Transfers	16 Sectors
LBA Mode Control	Enabled
32 Bit I/O	Disabled
Transfer Mode	FPI0 4/DMA 2
Ultra DMA Mode	Mode 2

Primary Slave	None
Type	Auto
Multi-Sector Transfers	Disabled
LBA Mode Control	Disabled
32 Bit I/O	Disabled
Transfer Mode	Standard
Ultra DMA Mode	Disabled
Secondary Master	None
Type	Auto
Multi-Sector Transfers	Disabled
LBA Mode Control	Disabled
32 Bit I/O	Disabled
Transfer Mode	Standard
Ultra DMA Mode	Disabled
Secondary Slave	None
Type	Auto
Multi-Sector Transfers	Disabled
LBA Mode Control	Disabled
32 Bit I/O	Disabled
Transfer Mode	Standard
Ultra DMA Mode	Disabled
System Memory	640 K
Extended Memory	64512 K

Advanced Values

Installed O/S	Other
Secured Setup Configuration	No
Reset Confirmation Data	No
Cache Memory	
Memory Cache	Enabled
Cache System BIOS	Write Protect
Cache Video BIOS	Write Protect
Cache Base 0-512 K	Write Back
Cache Base 512K-640 K	Write Back
Cache Extended Memory	Write Back
Cache A000-AFFF	Disabled
Cache B000-BFFF	Disabled
Cache C800-CBFF	Disabled
Cache CC00-CFFF	Disabled
Cache D000-D3FF	Disabled
Cache D400-D7FF	Disabled
Cache D800-DBFF	Disabled
Cache DC00-DFFF	Disabled
Cache E000-E3FF	Write Protect
Cache E400-E7FF	Write Protect
Cache E400-E7FF	Write Protect
Cache EC00-EFFF	Write Protect
PS/2 Port	Touchscreen
USB Port 2	Primary

I/O Device Configuration

Serial Port A	Auto
Powered Port	Auto
Serial Port B	Auto
Parallel Port	Auto
Mode	ECP
Fdc on Lpt	Disabled
Floppy Diskette Controller	Enabled
Serial Port C	Enabled
Mode	Normal
Base I/O Address	3E8
Interrupt	IRQ 5
Powered	Auto
Serial Port D	Enabled
Base I/O Address	2E8
Interrupt	IRQ 11
Mode	RS-232
Disk-On-Chip Address	CE00 - CFFF
MSR Address	CC00 - CDFF
MSR Interrupt	6
System Monitors	
+12 V Status	*
+ 2.5 V Status	*

+ 5 V Status	*
CPU Temperature	*
System Temperature	*
Vcc Status	*
Vcore Status	*
Vio Status	*
Vlcd Status	*
Vtt Status	*
Multiple ROM Menu	
On-board Intel LAN	Enabled
Parallel CD-ROM Boot	Disabled
On-board Intel PXE	Enabled
Lucent WaveLAN ROM	Disabled
WaveLAN PXE ROM	Disabled
Selectable ROM 7	Disabled
Selectable ROM 8	Disabled
Selectable ROM 9	Disabled
Selectable ROM 10	Disabled
Selectable ROM 11	Disabled
Selectable ROM 12	Disabled
Selectable ROM 13	Disabled
Selectable ROM 14	Disabled
Selectable ROM 15	Disabled
Selectable ROM 16	Disabled

Beep Error Codes	Off
Large Disk Access Mode	DOS
Local Bus IDE Adapter	Both
Advanced Chipset Control	
Graphics Aperture	64 MB
Enable memory gap	Disabled
ECC Config	Disabled
SERR Signal condition	Multiple bit
Default Primary Video Adapter	AGP
PCI/PNP UMB Resource Exclusion	
C800 - CBFF	Available
CC00 – CFFF	Available
D000 – D3FF	Available
D400 – D7FF	Available
D800 – DBFF	Available
DC00 - DFFF	Available
PCI/PNP IRQ Resource Exclusion	
IRQ 3	Available
IRQ 4	Available
IRQ 5	Available
IRQ 7	Available
IRQ 9	Reserved
IRQ 10	Available

IRQ 11	Available
PCI IRQ line 1:	Auto Select
PCI IRQ line 2:	Auto Select
PCI IRQ line 3:	Auto Select
PCI IRQ line 4:	Auto Select
Boot-Time Diagnostic Screen	Disabled
QuickBoot Mode	Enabled
Continuous POST	Disabled
Boot menu retry	Keyboard
Allow warm boot	Disabled

Security Values

Supervisor Password Is	Clear
User Password Is	Clear
Set Supervisor Password	Press ENTER
Set User Password	Press ENTER
Diskette Access	Supervisor
Fixed Disk Boot Sector	Normal
Password on Boot	Disabled

Power Values

Power Savings	Disabled
Standby Timeout	Off
Auto Suspend Timeout	Off

IDE Drive 0 Monitoring	Disabled
IDE Drive 1 Monitoring	Disabled
IDE Drive 2 Monitoring	Disabled
IDE Drive 3 Monitoring	Disabled
PCI Bus Monitoring	Disabled
Video Power State Control	Auto

Boot Values

Intel (R) Boot Agent Version 4.0.17
Hard Drive
ATAPI CD-ROM Drive
Removable Devices

Exit Values

Exit Saving Changes	Press ENTER
Exit Discarding Changes	Press ENTER
Load Setup Defaults	Press ENTER
Discard Changes	Press ENTER
Save Changes	Press ENTER

Interrupts (Pentium III/Celeron)

The following table lists the default settings.

IRQ	System Resource
NMI	I/O Channel Check
0	Reserved, Interval Timer

IRQ	System Resource
1	Reserved, Keyboard buffer full
2	Reserved, Cascade interrupt
3	Serial Port 2
4	Serial Port 1
5	Serial Ports 3 and 4
6	Reserved, Floppy
7	Parallel Port 1
8	Real Time Clock
9	NCR Thermal interrupt/PII4 SMBus
10	Audio
11	LAN
12	Mouse (available if disabled)
13	Reserved, Math coprocessor
14	On-board IDE (available if IDE is disabled)
15	On-board IDE (available for MSR if IDE is disabled)

Memory Map (Pentium III/Celeron)

The following table details the memory map for the Pentium III/Celeron processors. The ESCD area from ED000-EDFFF is not available for use as an Upper Memory Block (UMB) by memory managers. The area from E0000-EBFFF is currently not used by the BIOS and is available for use as UMB by memory managers. Parts of this area may be used by future versions of the BIOS to add increased functionality.

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EC000-ECFFF	4 K	OEM (available as UMB)
E0000-EBFFF	48 K	BIOS Reserved (currently available as UMB)
D0000-DFFFF	64 K	Available HI DOS memory
CE000-CFFFF	8 K	Flash Disk (optional)
CC000-CDFFF	8 K	NCR Trigantor MSR (optional)
C0000-CAFFF	42 K	Onboard video BIOS
A0000-BFFFF	128 K	Reserved for video memory
9FC00-9FFFF	1 K	Extended BIOS Data (moveable by QEMM, 386MAX)
80000-9FBFF	127 K	Extended conventional
00000-7FFFF	512 K	Conventional

Chapter 4: Operating System Recovery

Introduction

This chapter discusses procedures how to recover the Operating System by using the parallel CD-ROM drive. The software is distributed on bootable CD-ROM media. The drivers that are necessary to run the CD-ROM are temporarily installed during boot.

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

Prerequisites

The following are required on the 7454 in order to perform an OS recovery using a CD.

- Bootable CD-ROM drive
  - External 2336-K007 (Parallel CD-ROM – Series 5 or Series 6)
- The terminal BIOS must be 1.02.00.00 or greater.
  - MicroSolutions BackPack CD-ROM Series 6 requires BIOS 2.1.1.1 or greater
- Keyboard

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

Updating Procedures

1. Connect the external CD-ROM (2336-K007) drive to the parallel port on the terminal.

2. Connect the power connector to the CD-ROM drive.

Parallel Connector

Power Connector

Parallel Connector
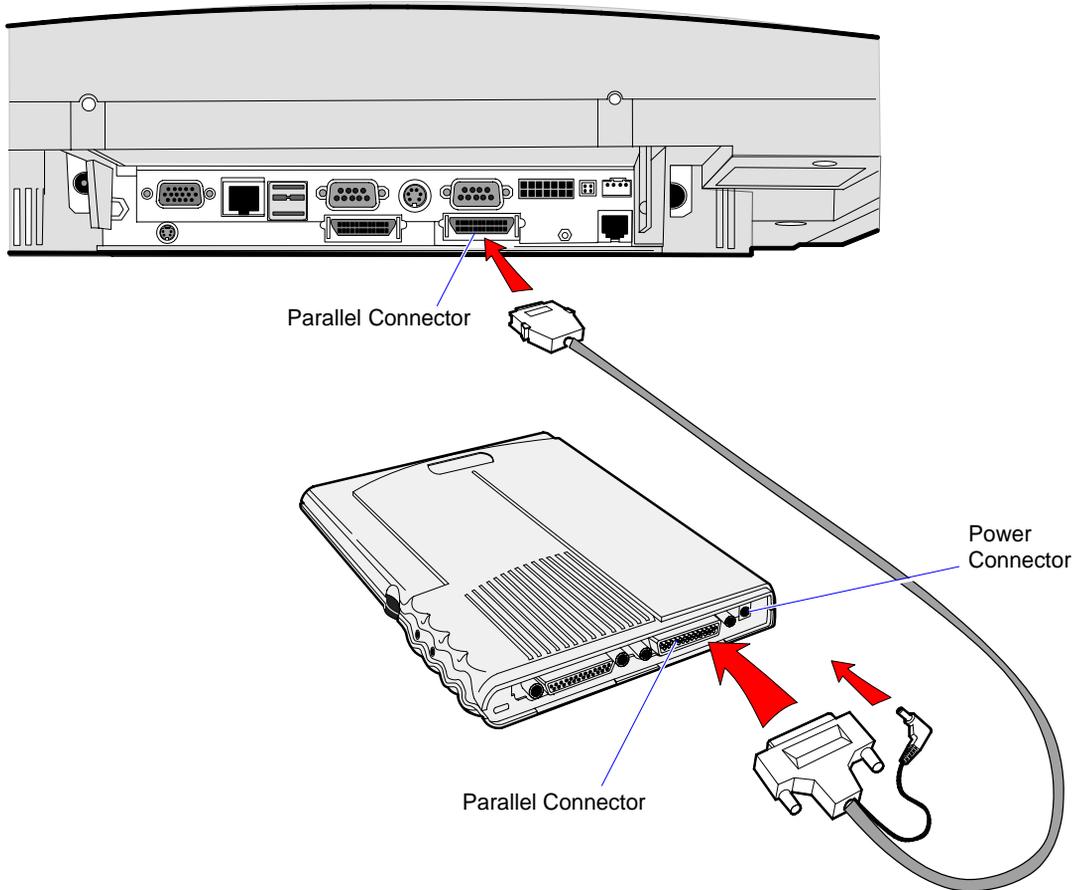
18250

Note: The parallel port on the 7454 is the Customer Display port. Therefore, if your terminal is configured with a Customer Display, you must temporarily disconnect it in order to use the CD-ROM drive.

3. Apply power to the terminal so the CD-ROM drive can be opened.

4. Insert the CD that contains the operating system image.

7454 Model	Software CD LPINs					
	Win2000	WinXPe	WinNT	Win98	Win95	DOS
*22xx	D370-0489-0100	Not Supported	D370-0433-0100	D370-0444-0100	D370-0442-0100	D370-0445-0100
32xx	D370-0516-0100	D370-0565-0100	D370-0501-0100	D370-0500-0100	D370-0503-0100 **Controlled	D370-0445-0100
34xx, 35xx, 36xx, 37xx	D370-0516-0100	D370-0565-0100	D370-0501-0100	D370-0500-0100	**Discontinued	D370-0445-0100

Note: * The 22xx models have been discontinued. Contact NCR Product Manager for LPIN availability.
** Contact Product Manager for Controlled Delivery support of Windows 95 LPIN for 32xx model.

5. Boot the terminal.

6. Press **F2** at the screen prompt to enter Setup.

7. Press **F9** to set BIOS System defaults.

8. In the **Advanced** menu, select **I/O Device Configuration**.

9. Verify that the **LPT 1 Mode** is set to **ECP**.

10. Go back to the **Advanced** menu, select **Multiple ROM Menu**.

11. Set the **Parallel CD-ROM Boot** to **Enabled**.

12. Set all other **Boot** options to **Disabled.**

13. Exit Setup and Save Changes.

    As the terminal reboots, you should see a message during boot indicating that the CD-ROM has been recognized:

    ```
    Micro Solutions BACKPACK CD-ROM v0.3
    . . .
    Booting from BACKPACK CD
    Starting MS-DOS
    ```

14. Follow the DOS screen prompts. After each entry you are asked to confirm your input. You can use *1* or *y* for **Yes**, *2* or *n* for **No**.

15. Enter whether or not you want to perform **Disk verification**. (Answering **Yes** takes twice as long, but is recommended.)

    If **Yes** is selected:

    - The Ghost® software verifies write operations and handles bad FAT clusters.

    - The Ghost error file (GHOST.ERR) is displayed before rebooting

    If **No** is selected:

    - The Ghost error file is displayed before rebooting only if Ghost aborts.

        Caution: If the error file is displayed, the batch file pauses for user input before rebooting. You may use Ctrl-C to cancel out of the batch file if you want to see the error file again, but **nothing** should be done that writes to the hard disk before rebooting. GHOST.ERR is on the RAM disk and is lost on reboot.

16. Select which type of recovery you want to perform from the next menu (normally option #1).

    1) Redo entire disk with the first partition the same size.

    2) Redo the first OS partition.

    3) Redo the second OS partition.

    The Ghost software then begins the disk recovery from the CD. It displays a progress bar and gives you an estimate how long the process should take.

    When the recovery process is completed, the client hard disk is restored to its preinstalled condition, as originally received from the factory.

17. At the completion of the recovery process remove the CD and press **ENTER** to reboot the terminal.

18. Remove the CD during reboot for the OS to begin. When system is restored, reset the BIOS to normal defaults.

Completing the OS Installation (Win2000)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, it will perform a disk check and then continue with the Windows 2000 installation.

2. Enter the *User Name* and *Organization*.

3. Enter the *Computer Name* for the client.

4. Enter the *Administrator's Account Password* (optional)

5. When prompted, press *Finish* to reboot the client.

6. Login when prompted.

7. Run the MicroTouch screen calibration from the Desktop icon.

Completing the OS Installation (WinXPe)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. Click the Admin button to login as Administrator.

2. Read the EULA (End-User License Agreement) information in the DOS window, then type **EXIT** and press **Enter** to close the DOS window.

3. Start the Network Setup Wizard.

4. Select options to identify the network information for the terminal environment.

5. Enter the *Computer Description*.

6. Enter the *Computer Name*.

7. Enter the *Workgroup Name*.

8. When prompted, press *Finish* to reboot the terminal.

9. Log in when prompted.

10. Open the Control Panel or use the TouchWare Icon on the desktop and run the MicroTouch screen calibration.

Completing the OS Installation (WinNT)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, press *Next* at the Windows Setup screen.

2. Accept the Microsoft license agreement.

3. Enter the *User Name* and *Organization*.

4. Enter the *Computer Name* for the client.

5. Enter the *Administrator's Account Password* (optional).

6. When prompted, press *Finish* to reboot the client.

7. Log in when prompted.

8. Open the Control Panel and run the MicroTouch screen calibration.

Completing the OS Installation (Win98)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. When the terminal boots it enters the Windows setup routine.

    Note: When installing Win98 on terminals with early Processor Boards (7454-22xx) there are few differences in the procedure as follows:

    a) The terminal starts the *Add New Hardware Wizard*.

    b) For each device found, permit Windows to search for new drivers (take defaults).

    c) After each driver is installed you are asked to reboot. Answer **No**.

2. At the **User Information** screen, enter the *User* information. This can be done using a keyboard or you can use the touch screen keyboard. After entering the information, press **Enter** or touch **OK**.

3. Go into the Control Panel and set the terminal Date and Time.

4. In the Control Panel, run the MicroTouch screen calibration.

Completing the OS Installation (Win95)

The system automatically reboots when the image recovery is complete and starts the software installation. This installation also installs most of the additional software and drivers that are included in the disk image. Complete the installation as follows.

1. After the terminal reboots, press *Next* at the Windows Setup screen.

2. At the **User Information** screen, enter the *User* information. This can be done using a keyboard or you can use the touch screen keyboard. After entering the information, press **Enter** or touch **OK**.

3. Open the Control Panel and run the MicroTouch screen calibration.

Completing the OS Installation (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 made on top of the generic operating system.

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

Microsoft Operating System License Agreements

When purchasing a workstation or kiosk preloaded with a Microsoft operating system, the application provider must follow certain license agreement guidelines. Listed below are some of the major points of Microsoft's "Embedded Software" agreement, which currently covers DOS, Win 3.11, Windows 95, Windows 98, Windows NT, Windows 2000, and Windows XPe.

- The end user application should not permit the user (typically a cashier) to exit the application so that they may be able to browse the operating system desktop, explorer, or other Microsoft operating system user interface elements. This does not apply to servicing, upgrading, or diagnosing problems for the workstation by services or field engineers. This restriction is meant to ensure that the end user is only permitted to navigate within the confines of the end user's application under normal operating conditions.

- The NCR OS Recovery image can only be used to recover or update systems with licenses procured from NCR.

Operating System Restrictions

The following section describes restrictions for operating systems used with the 7454 terminal.

Standby and Hibernate Mode Restriction

When using a 7454 terminal without a keyboard or mouse, the Windows 2000, Windows XP PRO, and Windows XP Embedded OS *Standby Mode* and *Hibernate Mode* should be avoided. These two *modes* place the hardware in a *low power state* which requires an interrupt to restart the processor.

The Windows 2000 and Windows XP Embedded Gold Disk Images disable *Hibernate Mode* and *Standby Mode* on the 7454 terminal. ***These two modes should not be used without a keyboard or mouse.***

NCR 7454-32xx Win2000 Operating System Recovery Software
(Version 02.02.00.02)
(LPIN: D370-0516-0100)

Note: This product should only be used on 7454 terminals with a Microsoft Windows 2000 license

7454-32xx Windows 2000 Operating System Recovery Software provides the means of restoring the operating system to the hard disk of a 7454 POS terminal. The bootstrap program (di_intel.bsd) and disk recovery boot image (di_intel.bid) are downloaded to the target terminal over the network and restore the hard disk to the preinstalled state as shipped from the factory. This enables installation of the following software:

- Microsoft Windows 2000 Professional w/ SP2

- Microsoft Internet Explorer 6.0 (6.0.2600.0000)

- Internet Explorer SP1

- SMI Lynx EM/EM+ Video driver (5.0.2195.178)

- SoundFusion Audio driver (5.12.01.3041)

- Intel 82559 Ethernet LAN drivers (5.0.67.0)

- NCRSYSM driver (3.0.1.9)

- Windows Installer (2.0)

- MicroTouch drivers (5.63)

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

- Backpack CD-ROM (3.02)   C:\Install\Drivers\CDRom

- Edgeport USB (1.16.9)   C:\Install\Drivers\USB

Furthermore, the following settings/revisions have been configured:

- Preinstalled W2K 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
- Ran Sysprep, using sysprep.inf and sysprep.bat, so that the mini installation will run on initial boot with the following parameters:

  - Automatically include PID
- Established a FAT32 primary system partition that fills the entire drive
- Included necessary OS cab files in C:\Install
- Installed SP2
- Exposed to both EM and EM+ video chipsets
- Exposed to a mouse so MicroTouch will install properly
- Installed SMI Control Panel (4.3.5)
- Installed Intel Proset utility
- Set virtual memory to 192-394
- Enabled APM
- Set 'APM monitor shutoff' to 'Never'
- 'Enable PME' (in Intel Proset utility) set to 'Hardware Default'
- Disabled game port
- Enabled DMA
- Set color to 16 bit
- Added SetResolution.exe to RunOnce registry.
- Added TerminalCheck.exe to Run registry.
- Added NCR-specific EULA.
- Added '/noguiboot' parameter to boot.ini to hide splash at startup.

NCR 7454-3xxx WinXPe Operating System Recovery Software
(Version 02.02.00.01)
(LPIN: D370-0565-0100)

Note: This product should only be used on 7454 terminals with a Microsoft Windows XPe license.

7454-3xxx Windows XPe Operating System Recovery Software provides the means of restoring the operating system to the hard disk of a 7454 POS terminal. The bootstrap program (di_intel.bsd) and disk recovery boot image (di_intel.bid) are downloaded to the target terminal over the network and restore the hard disk to the preinstalled state as shipped from the factory. This enables installation of the following software:

- Microsoft Windows XPe w/ SP1

- SMI Lynx EM/EM+ Video driver (6.13.10.228)

- Intel 82559 Ethernet LAN drivers (6.01.03.0000)

- NCRSYSM driver (3.0.4.12)

- MicroTouch drivers (5.64)

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

- Backpack CD-ROM (4.0.100.1190)   C:\Install\Drivers\CDRom

- Edgeport USB (2.20)   C:\Install\Drivers\USB

- Inside Out Networks
  Watchport/V Camera (2.20)   C:\Install\Drivers\Camera

Furthermore, the following settings/revisions have been 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 NFTS primary system partition that fills the entire drive

- Included necessary OS cab files in C:\Install

- Installed SMI Control Panel (4.2.2)

- Installed Intel Proset utility

- Set virtual memory to 128

- Enabled APM

- Set 'APM monitor shutoff' to 'Never'

- Set 'Enable PME' (in Intel Proset utility) to 'Hardware Default'

- Set color to 24 bit

- Added SetResolution.exe to RunOnce registry.

- Added NCR-specific EULA.

NCR 7454-22xx Win2000 Operating System Recovery Software
(Version 01.01.00.00
(LPIN: D370-0489-0100)

Installs the following software:

- Microsoft Windows 2000 Professional with Service Pack 1

- Microsoft Internet Explorer 5.0 (5.00.3103.1000)

- Chips and Technologies 69000 Assailant Video driver (2.46 Beta)

- Crystal Audio Codec driver (5.0.2184.1)

- Intel(R) 82559 Fast Ethernet LAN driver (5.0.67.0)

- MicroTouch Touchware (5.6C2)

- Backpack CD-Rom drivers available (version 3.02)

Configures the following settings/revisions:

- Sysprep.inf answer file and sysprep.bat batch file created to:
  - Skip EULA
  - Preinstall 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`

- Windows Installer (Version 1.1) installed

NCR 7454-32xx NT Operating System Recovery Software
(Version 02.02.00.01
(LPIN: D370-0501-0100)

Note: This product should only be used on 7454 terminals with a
Microsoft Windows NT license.

7454-32xx NT Operating System Recovery Software provides the
means of restoring the operating system to the hard disk of a 7454 POS
terminal. The bootstrap program (di_intel.bsd) and disk recovery boot
image (di_intel.bid) are downloaded to the target terminal over the
network and restore the hard disk to the preinstalled state as shipped
from the factory. This permits installation of the following software:

- Microsoft Windows NT with SP6a

- Microsoft Internet Explorer 6.0 (6.0.2600.0000)

- Internet Security Update (Q323759.exe)

- SMI Lynx 3DM Video driver (4.00.1381.0178)

- SoundFusion Audio driver (4.01.2086)

- Intel 82559 Ethernet LAN drivers (5.00.66.0000)

- NCRSYSM driver (3.0.1.9)

- Windows Installer (2.0)

- MicroTouch drivers (5.63 SR3)

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

- Backpack CD-ROM (2.04)   C:\Install\Drivers\CDRom

- Edgeport USB (2.13)   C:\Install\Drivers\USB

Furthermore, the following settings/revisions have been configured:

- Preinstalled NT 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

- Ran Sysprep (so that the mini installation will run on initial boot) with the following parameters:

  - Automatically include PID

- Host.cmd set in RunOnce to update the registry

- Established a 2gb FAT16 primary system partition

- Established a secondary NTFS partition that fills the remainder of the drive

- Included necessary OS cab files in C:\Install

- Made SP6a folder available in C:\Install (installed)

- Exposed to both EM and EM+ video chipsets

- Installed SMI Control Panel (4.3.5)

- Installed Intel Proset utility

- 'Enable PME' (in Intel Proset utility) set to 'Hardware Default'

- Enabled DMA

- Muted Volume Line-In

- Added SetResolution.exe to RunOnce registry.

- Added TerminalCheck.exe to Run registry.

- Added NCR-specific EULA.

- Added '/noguiboot' parameter to boot.ini to hide splash at startup.

NCR 7454-22xx NT Operating System Recovery Software
(Version 01.04.01.00
(LPIN: D370-0433-0100)

Installs the following software:

- Microsoft Windows NT Workstation 4.0 with Service Pack 4a. Service Pack 6 included (but not installed) on the disk

- Microsoft Internet Explorer 5.0

- MicroTouch TouchWare Version 5.4 for Mouse Port software

- Chips & Technologies 69000 Video driver

- CrystalWare Audio driver

- Intel EtherExpress software

- Intel PIIX Bus Master IDE drivers

- M-Systems DiskOnChip 2000 driver (not installed) available

- Backpack CD-ROM drivers (not installed) available

Configures the following settings/revisions:

- Enables the NT Dump settings to:
    - send an administrative alert
    - write dump to file
    - overwrite existing file
    - auto reboot after dump

- Mutes the Volume Line-In

- Changes event log to overwrite events as needed for the Application Type event logs

- Changes the Windows Scroll Bar Size from 16 to 18 pixels for easier Touch response

- Sysprep.inf answer file created to:
    - Skip EULA
    - Preinstall the Product ID Number (PID)

- Places the Gold Drive Part Number, Date Created, LPIN, and Version in Registry under:
  `HKey-Local_Machine\Software\NCR\Gold Drive`

- Windows Installer (Version 1.1) installed

- Removes the following key from the registry (as a current COM9 issue workaround):
  `Hkey_Local_Machine\System\CurrentControlSet\Servi ces\Serial\Parameters\ Serial 10999`

- Changes page file size to 139-256

NCR 7454-32xx Win98 Operating System Recovery Software
(Version 02.02.00.01)
(LPIN: D370-0500-0100)

Note: This product should only be used on 7454 terminals with a Microsoft Windows 98 license.

7454-32xx Win98 Operating System Recovery Software provides the means of restoring the operating system to the hard disk of a 7454 POS terminal. The bootstrap program (di_intel.bsd) and disk recovery boot image (di_intel.bid) are downloaded to the target terminal over the network and restore the hard disk to the preinstalled state as shipped from the factory. This permits installation of the following software:

- Microsoft Windows 98SE

- Microsoft Internet Explorer 6.0 (6.0.2600.0000)

- Internet Explorer Security Update (Q323759.exe)

- SMI Lynx 3DM Video driver(4.12.01.0034)

- SoundFusion Audio driver (4.12.2885)

- Intel 82559 Ethernet LAN drivers (5.00.67.0000)

- NCRSYSM driver (3.0.1.8)

- Windows Installer (2.0)

- MicroTouch drivers (5.63 SR3)

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

- Backpack CD-ROM (2.04)   C:\Install\Drivers\CDRom

- Edgeport USB (1.16.9)   C:\Install\Drivers\USB

Furthermore, the following settings/revisions have been configured:

- Preinstalled Win98 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
- Added Userinfo.exe to Start Menu to capture User Name, User Organization, Computer Name, and Workgroup (once the user has entered this information, userinfo will remove itself from the Start Menu)
- Established a FAT32 primary system partition that fills the entire drive
- Included necessary OS cab files in C:\Install
- Exposed to both EM and EM+ video chipsets
- Installed Intel Proset Utility
- Applied a Microsoft hotfix to replace usbhub.sys version 4.10.2222 with 4.10.2223; this executable has been placed in C:\Install\Drivers\USB\Hotfix
- Enabled DMA
- Disabled DSound Acceleration and Sensaura/EAX in the SoundFusion control panel
- Disabled game device and joystick
- Set to High Color
- 'Enable PME' (in Intel Proset utility) set to 'Hardware Default'
- Muted the Volume Line-In
- Added SetResolution.exe to RunOnce registry.
- Added TerminalCheck.exe to Run registry.
- Added NCR-specific EULA.
- Added '/noguiboot' parameter to boot.ini to hide splash at startup.

NCR 7454-22xx Win98 Operating System Recovery Software
(Version 01.01.00.00)

(LPIN: D370-0444-0100)

Installs the following software:

- Microsoft Windows 98 Second Edition
- Microsoft Internet Explorer 5.0
- MicroTouch TouchWare Version 5.4 for Mouse Port software
- Chips & Technologies 69000 Video driver
- Crystal Audio driver
- Intel 8255x-based PCI Ethernet Adapter
- Intel PIIX Bus Master IDE drivers
- Backpack CD-ROM drivers (not installed) available

Configures the following settings/revisions:

- Mutes the Volume Line-In
- Places the Gold Drive Part Number, Date Created, LPIN, and Version in Registry under:
  `HKey-Local_Machine\Software\NCR\Gold Drive`
- Windows Installer (Version 1.1) installed

NCR 7454-32xx Win95 Operating System Recovery Software
(Version 02.01.00.01)

(LPIN: D370-0503-0000)

> **Note:** This product should only be used on 7454 terminals with a Microsoft Windows 95 license.
>
> 7454-32xx Windows 95 Operating System Recovery Software provides the means of restoring the operating system to the hard disk of a 7454 POS terminal. The bootstrap program (di_intel.bsd) and disk recovery boot image (di_intel.bid) are downloaded to the target terminal over the network and restore the hard disk to the preinstalled state as shipped from the factory. This permits installation of the following software:
>
> - Microsoft Windows 95 OSR2
>
> - Microsoft Internet Explorer 5.5 (5.50.4134.0600)
>
> - SMI Lynx 3DM Video driver (4.12.01.0034)
>
> - SoundFusion Audio driver (4.12.2885)
>
> - Intel 82559 Ethernet LAN drivers (5.00.66.0000)
>
> - PIIX IDE BusMaster drivers (3.3.0.2)
>
> - NCRSYSM driver (2.01.01.004)
>
> - Windows Installer (1.1)
>
> - MicroTouch drivers (5.62)

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

- Backpack CD-ROM (2.04)   C:\Install\Drivers\CDRom

- M-Systems DiskOnChip (4.2)   C:\Install\Drivers\DskonChp

- Edgeport USB (1.15.2)   C:\Install\Drivers\USB

Furthermore, the following settings/revisions have been configured:

- Preinstalled Win95 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

- Added Userinfo.exe to Start Menu to capture User Name, User Organization, Computer Name, and Workgroup (once the user has entered this information, userinfo will remove itself from the Start Menu)

- Established a 2gb FAT16 primary system partition

- Established a secondary FAT32 partition that fills the remainder of the drive

- Included necessary OS cab files in C:\Install

- Exposed to both EM and EM+ video chipsets

- Installed Intel Proset Utility

- Disabled game device and joystick

- Set color to 256

NCR 7454-22xx Win95 Operating System Recovery Software
(Version 01.02.00.00)

(LPIN: D370-0442-0000)

Installs the following software:

- Win95 w/PID
- Msdos.sys file edited to include the following parameter:
  ```
  Autoscan = 2
  ```

- IE5
- MicroTouch version 5.4
- Volume Line-in set to 0
- Scroll Bar Size set to 18
- PCMCIA files updated:
  - Cbss.vxd
  - Pci.vxd
  - Pccard.vxd
  - Pcmcia.inf

- Userinfo.exe added (User info input)
- Windows Installer
- Amdk6upd.exe
- Version control added to Registry to track Gold Disk version info:
  ```
  Hkey_Local_Machine\Software\NCR\FitSock\Gold Drive
  ```

OS Recovery from a Larger Disk Image

The following procedure should be used to restore an Operating System when the destination disk is smaller than the source image (i.e., OS Recovery was made on a 10 GB source disk, but is being recovered on a 4.3 GB drive).

1. Boot the system.

    You should see a message during boot indicating that the CD-ROM has been recognized:

    ```
    Micro Solutions BACKPACK CD-ROM v0.3
    . . .
    Booting from BACKPACK CD
    Starting MS-DOS
    ```

2. Follow the DOS screen prompts. After each entry, you are asked to confirm your input. You can use *1* or *y* for **Yes**, *2* or *n* for **No**.

3. Enter **No** at the **Disk verification** question.

4. Select which type of recovery you want to perform from the next menu (normally option #1).

    1) Redo entire disk with the first partition the same size.

    2) Redo the first OS partition.

    3) Redo the second OS partition.

5. At the *Press any key to continue* dialog box, press **[CTRL]-C** to abort the process. When asked `Terminate batch job?` Answer **Y**.

6. From the command prompt, change to drive Z, which is the location of the Ghost software (CD-ROM drive).

7. Run the Ghost command.

    `Ghost.exe`

8. Press **Enter**.

9. Select **Local** → **Disk** → **From Image** and press **Enter**.

10. The directory that Ghost is now looking in should be Z: (if not, switch to Z). Select the **File name to load image from** file (*nnnnnnn*.gho) and press **Enter**.

11. Select the **Local destination drive** and press **Enter**.

12. Set the sizes of the primary and secondary partitions as follows.

O/S	Primary Partition/ Format	Secondary Partition Size
DOS	2 GB/FAT16	2 GB/FAT16
Win95	2 GB/FAT16	Fill remainder as FAT 32
WinNT	2 GB/FAT16	Fill remainder as NTFS
Win98	Single FAT 32 partition	N/A
Win2000	Single FAT 32 partition	N/A
WinXPe	Single NTFS partition	N/A

Note: In order to do this you may need to clear the amount from the second partition.

13. Press **Enter**.

14. If you are recovering from Win9x, it is likely that the second partition will be too small for FAT32. If so, a dialog is displayed `Converting partition from FAT32 to FAT, proceed?` Choose **Yes**.

15. At the next dialog box,
    `Proceed with disk load? Destination drive will be permanently overwritten,`
    Choose **Yes** to start the recovery process.

Chapter 5: BIOS Updating Procedures

Introduction

The terminal's BIOS can be updated using a parallel CD-ROM drive and software available on bootable CD-ROM media. The drivers necessary to run the CD-ROM are temporarily installed during boot. This chapter describes this procedure.

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

Crisis Recovery

In the event the BIOS becomes corrupt, such as the result of a power failure during the BIOS Update procedure, you can use the method discussed later in this chapter in the *BIOS Crisis Recovery* section to recover the BIOS.

Prerequisites

The following are required on the 7454 in order to perform a BIOS update using a CD.

- Bootable CD-ROM drive
    - External 2336-K007 (Parallel CD-ROM – Series 5 or Series 6)
- The terminal BIOS must be 1.02.00.00 or greater.
    - MicroSolutions **backpack®** CD-ROM Series 6 requires BIOS 2.1.1.1 or greater
- Keyboard
- *NCR BIOS and BIOS Update Software*
  (LPIN: A370-0022-0100)

Updating Procedures

1. Connect the external CD-ROM (2336-K007) drive to the parallel port on the terminal.

2. Connect the power connector to the CD-ROM drive.

18250
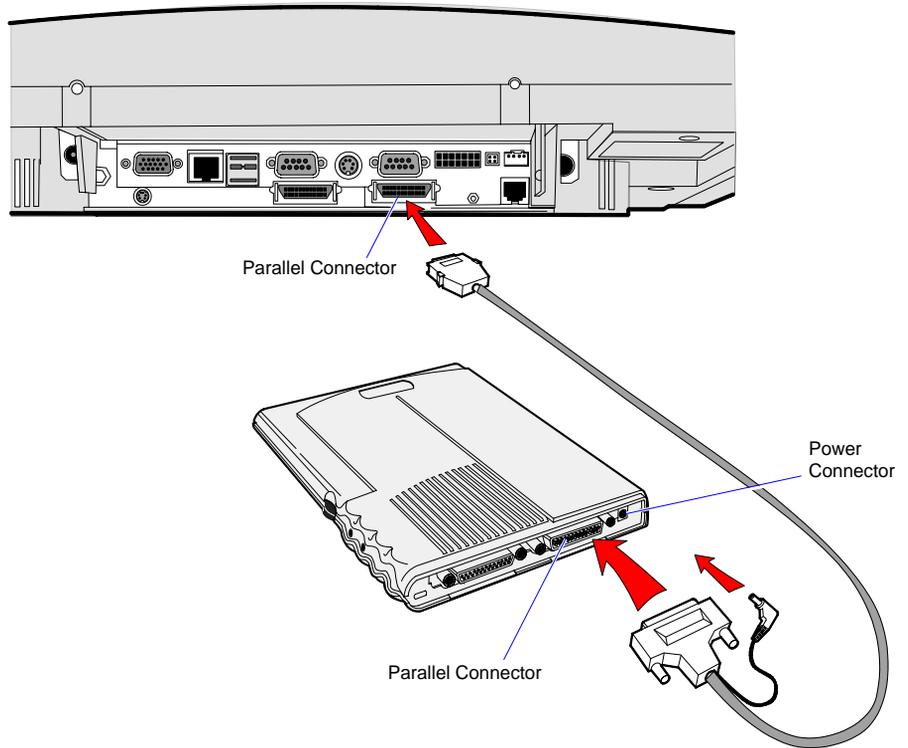
Note: The parallel port on the 7454 is the Customer Display port. Therefore, if your terminal is configured with a Customer Display, you must temporarily disconnect it in order to use the CD-ROM drive.

3. Apply power to the terminal so the CD-ROM drive can be opened.

4. Insert the BIOS update CD.

   NCR BIOS and BIOS Update Software
   LPIN: A370-0022-0100

5. Boot the terminal.

6. Press **F2** at the screen prompt to enter the Setup Utility.

7. In the **Advanced** menu, select **I/O Device Configuration**.

8. Verify that the **LPT 1 Mode** is set to **ECP**.

9. Go back to the **Advanced** menu, select **Multiple ROM Menu**.

10. Set the **Parallel CD-ROM Boot** to **Enabled**.

11. Exit Setup and Save Changes.

    As the terminal reboots, you should see a message during boot indicating that the CD-ROM has been recognized:

    ```
    Micro Solutions BACKPACK CD-ROM v0.3
    . . .
    Booting from BACKPACK CD
    Starting MS-DOS
    ```

12. 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 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, there is not model/serial number information in the BIOS.

        Important: Model/Serial Number is mandatory for FitClient operation.

    *   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.

13. When you get the green window, this indicates a successful update.

14. Remove the CD and then press any key to reboot.

13. When the system reboots, press **F2** at the screen prompt to enter Setup.

14. In the **Exit** menu, select **Load Setup Defaults**.

15. Exit Setup and Save Changes.

BIOS Crisis Recovery

The procedures below provide a way to restore the BIOS resulting from a non-recoverable condition.

Note: Use this BIOS crisis recovery procedure only for a **NON-RECOVERABLE** BIOS failure. A non-recoverable BIOS state typically results from power loss during a flash BIOS update process. This is a rare occurrence and should not be confused with other hardware errors that cause a *no video* state. **This procedure is not intended to be used for changing or upgrading an operational BIOS**.

Required Hardware

Part Number	Part Name	Use
	PC with at serial port	Download BIOS
497-0408349	Cable, 9-Pin Female to 9-Pin Female RS232	PC to terminal connection
497-0411000	Cable, Parallel Interface	7454 parallel port to Dongle connection
497-0413418	Parallel Dongle	Forces BIOS recovery
497-0414184	POS Connector Board	7454 parallel port (not required if already present)

Required Software

Acquire the following software from NCR.

NCR 74xx BIOS and BIOS Update Software
LPIN: A370-0022-0100, Release 3.0 or later
P/N: 497-0424310

Recovery Procedures

1. Connect the Parallel I/F Cable to the parallel (Customer Display) connector on the terminal.

RS-232
(Com 1)   Customer
Display
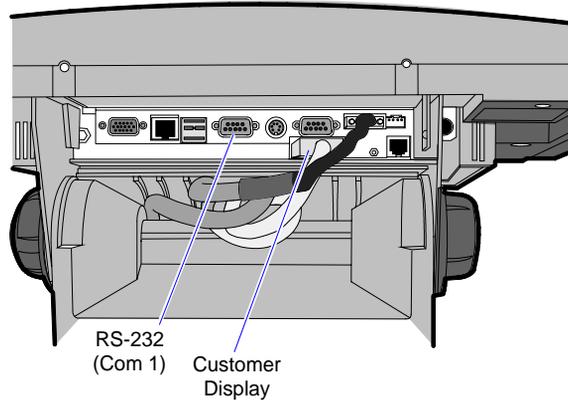
16993

Note: The parallel connector on the 7454 terminal is used for the Customer Display. If the terminal is equipped with a Customer Display you must temporarily disconnect the display cable. If the terminal is not equipped with a Customer Display then it is likely that the terminal does not have a parallel connector and you will have to install the POS Connector Board.

See the *NCR 7454 Retail Terminal Hardware Service Guide* (B005-0000-1342) for information how to open the terminal and install the POS Connector Board.

2. Connect the two machines with the RS-232 cable. Use COM Port 1 on both machines (COM1 is next to the USB ports on the 7454).
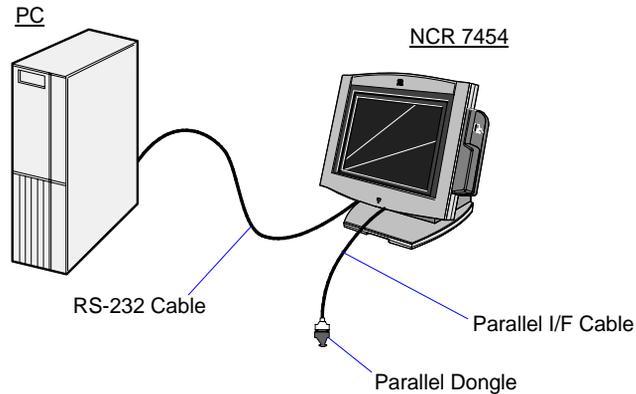
16991

3. Connect the Parallel Dongle to the Parallel I/F Cable.
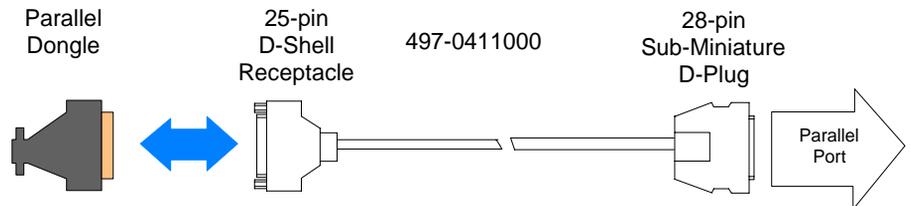
16992

4. Boot the PC in the DOS mode with CD-ROM support.

Note: The PC must be running in the DOS mode (not in a Windows DOS box) for the software to operate correctly.

5. Insert the BIOS update CD into the PC.

    NCR BIOS and BIOS Update Software
    LPIN: A370-0022-0100

6. Apply power to the terminal.

7. On the PC, change directory to the CD-ROM drive.

    ```
    E: [Enter]
    ```

8. Enter the update command:

    ```
    EMBflash [Enter]
    ```

9. Select the number for the 7454 terminal from the menu list:

    ```
    1) 7454
    2) 7401
    3) 7452
    4) 7453
    5) 7455
    6) 7460
    7) 7451
    8) 7456

    1 [Enter]
    ```

    A blue screen displays as the program runs, showing the program progress, followed by a green screen, indicating a successful load.

    PhoenixPhlash Status

    Flash memory has been successfully programmed

    PRESS ANY KEY TO EXIT
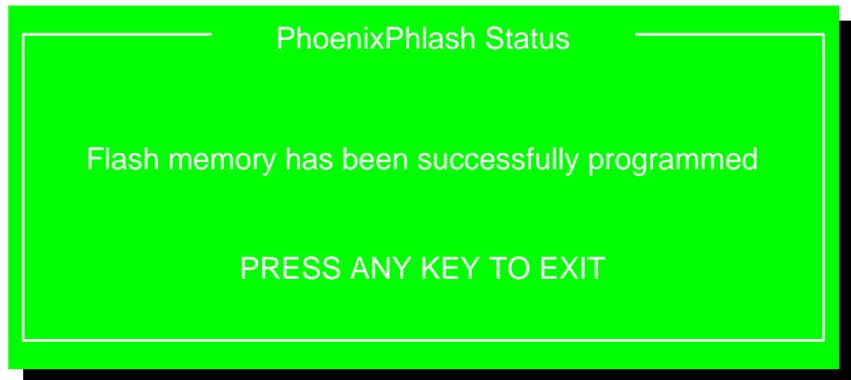
    19502

    The Class/Model/Serial # information is deleted using the Crisis Recovery procedure. Use the normal BIOS update procedures, as discussed earlier in this chapter, to restore the information.

Cable/Connector Pin-Out Information

Parallel Dongle

25-Pin D-shell Receptacle
(Viewed from wiring side)

13	12	11	10	9	8	7	6	5	4	3	2	1

25	24	23	22	21	20	19	18	17	16	15	14

19513

RS-232 Cable

P1   P2

9-Pin
D-shell
Receptacle

9-Pin
D-shell
Receptacle

5   1
9   6

1
5   6
9

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

P1   P2
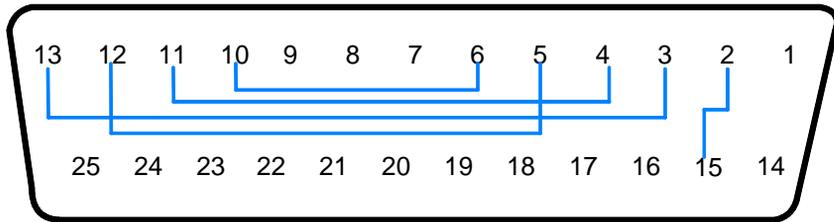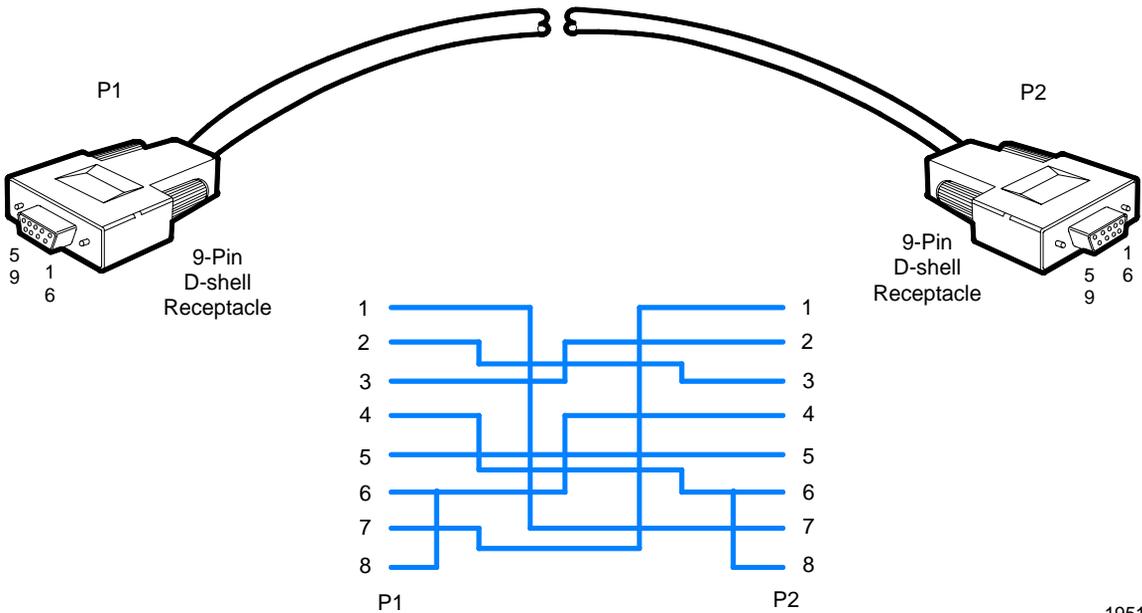
19512

Chapter 6: NCR 7454 4x20 Customer Display

Introduction

This chapter defines the character sets and supported commands. The NCR 7454 4x20 Customer Display is IEEE 1284 Compatible and supports Extended Capability Parallel (ECP).

Viewing Area

The characters are arranged in 4 rows of 20 characters. Each character is a 5x7 dot matrix.

16674
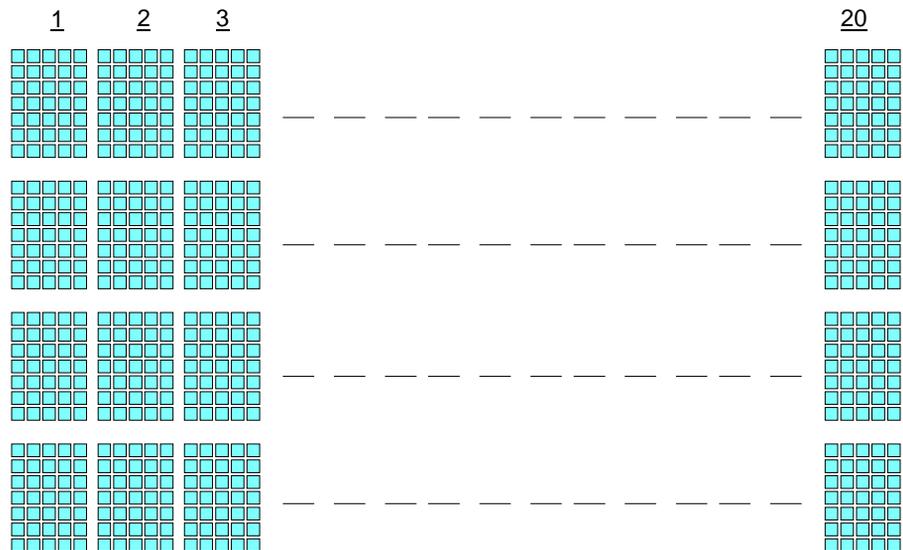
Diagnostics

Power-Up Diagnostics occur soon after the hardware reset circuitry is released, or when a Reset Display command is received from the host software. When the hardware is powered down, all registers and memory are lost. The display is not capable of any kind of power recovery back to a previous state. As a part of the Power-Up Diagnostics, the working registers and variables are initialized (set to zero).

The self-diagnostics include:

1. Micro-controller Test

    The Busy line is set active at the beginning of the test. The first test is Exclusive-ORing all internal program memory locations and the result of the test is zero. Any unused bytes in the summed page are always programmed with null values so that they do not have an impact on the execution of the test. An internal RAM test writes a varying numerical value to each RAM location. The pattern must show that all RAM locations can be uniquely addressed. All RAM will be written. After the write phase is complete, a read phase begins to ensure the writes held. If an error is discovered, testing halts and the firmware begins executing a forever do nothing loop.

2. Display Test

    The display will run an extra test that turns on all pixels on the display (character cells) for about two seconds and then displays the part number and the firmware version "008-0221552, V1.00.01" for another two seconds. This permits a user to examine the display for any pixel failure. The unit does not have the capability to determine if the Display Test passed. Once diagnostic testing is completed, the line states will be returned to normal and the firmware branches to its idle routine.

Note: When the I/F receives a Reset command, only Step 1 is executed. The Display Test is not executed.

Character Set

Page 1 – International

Page 2 – Japanese

MSB: D7-D4 / LSB: D3-D0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000																
0001																
0010																
0011																
0100																
0101																
0110																
0111																
1000																
1001																
1010																
1011																
1100																
1101																
1110																
1111																

Page 3 – Code Page 850

The table shows Code Page 850 character set. Column headers (D7 D6 D5 D4) from 0 to F, row headers (D3 D2 D1 D0) from 0 to F. Position 2/0 is SP (SPACE). The cells contain dot-matrix rendered characters of Code Page 850.

SP : SPACE

Command Descriptions

Structure/Logic Description

The Retail VFD firmware is comprised of operating system type services such as common subroutines, interrupt service routines, and data processing routines. Normally, the firmware is always active refreshing the Retail VFD to keep display data visible. The firmware will also act on interrupts due to host parallel communication. This communication is in the form of commands from the host to the Retail VFD that require the Retail VFD to modify the display appearance.

The Retail VFD firmware uses a micro-controller and interfaces to parallel links.

Host/Retail VFD Command Interface

The Retail VFD accepts two types of data; display data and command data. If a byte received from the host is any character except ESC (0x1B) character, it is processed as a character and displayed on the Retail VFD. If an ESC character (0x1B) is received, the subsequent byte(s) is processed as a command. If the subsequent byte is an invalid command it will be ignored. If an ESC is received, but no subsequent byte is received within ten seconds, the firmware will ignore it.

Note that each command consists of at least two bytes. The first byte (0x1B) is a command identifier indicating the next byte(s) is a command byte. The command byte may be followed by parameter or data bytes depending on the command. It is only valid to receive an ESC (0x1B) as a command identifier.

The following table describes the supported Retail VFD commands.

Command	Function	Return Status/String
1B 01	Reset Display	No
1B 02	Erase Display	No
1B 03	Invalid Command	No
1B 04	Set Diagnostic State	No
1B 05	Set Display State On	No
1B 06	Set Low Power State On (Default)	No
1B 07	Enable Cursor	No
1B 08	Disable Cursor (Default)	No
1B 09	Set Screen Save Blank (Default)	No
1B 0A	Set Screen Save Walk	No
1B 0B	Turn On Screen Save	No
1B 0C	Disable Screen Save Feature	No
1B 0D	Enable Character Blink	No
1B 0E	Disable Character Blink (Default)	No
1B 0F	Move Cursor Left	No
1B 10	Move Cursor Right	No
1B 11	Move Cursor Up	No
1B 12	Move Cursor Down	No
1B 13	Set Cursor Position	No
1B 17	Brightness Adjustment (Default = 5)	No
1B 18	Read Display ID	Yes
1B 19	Read Display ID String	Yes
1B 20	Select Character Set 1 (Default)	No
1B 21	Select Character Set 2	No
1B 22-32	Reserved	No
1B 38	Read Display Data String	Yes

Reset Display

Format: 1B 01

Description: This command executes the power-down power-up diagnostic
                 sequence. The BUSY line is set to active condition. The micro-controller
                 test consists of a sum-check test on the ROM and a write/read test on
                 the RAM. After executing the command, the display screen is cleared,
                 the cursor moves to the 0 position, the BUSY line is set to inactive
                 conditions, and all registers and variables are initialized. Note that the
                 screen is cleared during this command. If a host needs previous data
                 redisplayed, the host must resend the previous data after this
                 command has completed.

Erase Display

Format: 1B 02

Description: This command clears all of the displayed characters by writing a space
                 to each display position. A space is defined as character 0x20 of the
                 current character set. The cursor moves to the 0 position.

Invalid Command

Format: 1B 03

Description: This in now an invalid command.

Set Diagnostic State

Format: 1B 04

Description: This state is exclusive from the On and Low Power states. This
                 command causes the firmware to display the current NCR part number
                 and firmware version of the device. For example, the current part
                 number and firmware version of the device are 008-0221537 and
                 V1.00.01) for two seconds and then step through each installed 256-
                 character set (default and user defined) displaying one character at a
                 time on all 40 display positions at a rate of about one character per
                 second. Start with the currently selected character set and then display
                 all of the characters from the other sets the same way. This continues
                 until one of the other state commands is performed. Prior display data
                 is saved and can be restored be sending the Turn On (state 3) com-
                 mand.

Set Display State On

Format: 1B 05

Description: This state is used for normal run-time conditions. This operation
                 instructs the firmware to leave one of the other states and begin
                 performing normal refresh operations. There may be a slight delay
                 before the VFD reaches the specified brightness setting when exiting
                 the Low Power State. This delay should not exceed 1 second from the
                 time the command is received until the time the VFD reaches the
                 specified brightness.

                 Highest priority is given to refresh operations and a lower priority is
                 given to host communications. Host communications still work, but if a
                 large amount of data is to be programmed in a very short time frame, it
                 would work faster if the Blank State was programmed prior to the
                 information transfer.

The Screen Save feature may be in force during the Display On state. This means that after about five minutes of no new display activity, the Screen Save feature could take over and cause the display to go blank or begin walking from right to left.

Set Low Power State On

Format: 1B 06

Description: This state is used to reduce Retail VFD power consumption and extend the life of the Retail VFD. Power is only removed from the VFD and the display will not be refreshed. The Retail VFD controller is still fully operational and will continue to accept commands. This command causes the firmware to blank or turn off the Retail VFD. Display data can be processed while the display is in the Low Power state, but it will not appear until the Low Power state is changed. The displayed character(s) states is preserved so that upon leaving the Low Power State the display is restored. To leave the Low Power State, one of the other state commands must be received. This is the default state for the Retail VFD after power-up.

Enable Cursor

Format: 1B 07

Description: This command causes a flashing cursor to be used whenever the Display On state is in force. When the cursor is enabled, the firmware will show a visible flashing cursor at the current cursor position. The flashing cursor should be visible for one second and then the character at the cursor position should be visible for one second. The effect is to alternate between the character and the cursor. The cursor is defined as character 5FH of whatever character set is currently chosen. For the two supported character sets, the cursor is the bottom row of pixels turned on. For a user defined character set, the cursor will be whatever is defined as character 5FH of the character set. When the cursor is enabled, it overwrites the character at the cursor position. If the cursor is disabled, the character at the cursor position is left visible.

Disable Cursor

Format: 1B 08

Description: This command causes the cursor to be turned off. This is the default
                     state for the cursor after power-up. A disabled cursor does not
                     overwrite a displayed character.

Set Screen Save Blank

Format: 1B 09

Description: This command is intended to preserve the life of the display hardware
                     unit. The firmware maintains a five-minute timer that triggers this
                     feature. The Screen Save feature can be disabled through a command
                     from the host software. When the feature is not disabled, two specific
                     options exist. The Set Screen Save Blank operation causes the display to
                     go blank when the timer expires. When the firmware receives the
                     command code, the Screen Save mode is canceled and the five-minute
                     timer is established. Screen Save Blank removes power from the Retail
                     VFD and does not refresh the display in the same manner as the Set
                     Low Power On command. At power up, the timer is established at five
                     minutes and Screen Save Blank is established as a default. The five
                     minute timer is not reset by any invalid or incorrect command.

Set Screen Save Walk

Format: 1B 0A

Description: This command causes the visible display to walk right to left when the
                     Screen Save timer expires (five minutes). The characters on the display
                     will appear to walk across the corresponding display row from right to
                     left. The four lines in the 4x20 Display will walk in parallel completely
                     off the left side of the display and then the four lines will appear to
                     come back from the right. If the display is space filled, then no effect is
                     perceived even though the walking is taking place. The Screen Save
                     Blank mode is the default mode after power up.

Turn On Screen Save

Format: 1B 0B

Description: This command causes the one of the screen save functions (Set Screen
                     Save Blank or Set Screen Save Walk) to activate immediately rather
                     than waiting for the screen save timer to expire. If the Disable Screen
                     Save Option command is in effect when this command is issued, it is
                     canceled and the screen saver is enabled and activated immediately.

Disable Screen Save Option

Format: 1B 0C

Description: The firmware will cease to keep time for the screen save activity from
                     the host software and the display will neither go blank nor begin to
                     walk due to inactivity from the host. This command can be canceled by
                     the Turn On Screen Save, Set Screen Save Blank, and Set Screen Save
                     Walk commands.

Enable Character Blink

Format: 1B 0D

Description: The blink attribute is the only modifier that is supported for the display
                     character positions. The attribute itself is not necessarily programmed
                     with each new character code. Rather, each time a new character is
                     received, the current setting of the character blink operator is adopted
                     as the working attribute for the new character. If a new character is
                     received while character blink is enabled, the new character will blink.
                     This makes it possible to have a display with both blinking and non-
                     blinking characters. The blink period is one second on and one second
                     off. All characters that are blink enabled, blink at the same time. The
                     only way to cause an existing character to start or stop blinking is to set
                     up the character blink operator, locate the cursor to the correct
                     character, and resend the individual character code.

Disable Character Blink

Format: 1B 0E

Description: This command counteracts the Enable Character Blink. The firmware will implement all new character codes with an on and holding character presentation. On power up, the character blink modifier is defaulted to disabled.

Move Cursor Left

Format: 1B 0F

Description: Moves the cursor one position to the left. When the cursor is at the left end of the rows 2-4, it moves to the right end of the row above it. When the cursor is at the left end of the row 1, it moves to the right end of the row 4. The cursor location always indicates the position of the next character to be displayed, whether the cursor is enabled and blinking or not. After each character is displayed, the firmware performs a logical Move Cursor Right command.

Move Cursor Right

Format: 1B 10

Description: Moves the cursor one position to the right. When the cursor is at the right end of the row 1-3, it moves to the left end of the next row. When the cursor is at the right end of the row 4, it moves to the left end of the row 1. The cursor location always indicates the position of the next character to be displayed, whether the cursor is enabled and blinking or not. After each character is displayed, the firmware performs a logical Move Cursor Right command. When the cursor is at the right end of the row 4, it moves to the left end of the row 1 and operates in an Overwrite Mode. (i.e., The next character sent to the display will overwrite the character in the left end of the row 1.)

Move Cursor Up

Format: 1B 11

Description: Moves the cursor up one line. When the cursor is on the row 2-4, the cursor is moved to the same column on the row above it. When the cursor is on the row 1, the cursor is moved to the same column on the row 4. The cursor location always indicates the position of the next character to be displayed, whether the cursor is enabled and blinking or not. After each character is displayed, the firmware performs a logical Move Cursor Right command.

Move Cursor Down

Format: 1B 12

Description: Moves the cursor down one line. When the cursor is on the 1-3, the cursor is moved to the same column on the next row. When the cursor is on the row 4, the cursor is moved to the same column on the row 1. The cursor location always indicates the position of the next character to be displayed, whether the cursor is enabled and blinking or not. After each character is displayed, the firmware performs a logical Move Cursor Right command.

Move Cursor To Specified Position

Format: 1B 13 *nn*

Range: 00 ≤ *nn* ≤ 4F (hex)

Description: Moves the cursor to the specified position. Position 0 is the upper leftmost position and position 4F is the lower rightmost position. Any value outside this range will be discarded, the command will be ignored, and the cursor will not be moved. The cursor location always indicates the position of the next character to be displayed, whether the cursor is enabled and blinking or not. After each character is displayed, the firmware performs a logical Move Cursor Right command. The character positions are shown below.

0	1	2	3	4	5	6	7	8	9	0A	0B	0C	0D	0E	0F	10	11	12	13
14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	20	21	22	23	24	25	26	27
28	29	2A	2B	2C	2D	2E	2F	30	31	32	33	34	35	36	37	38	39	3A	3B
3C	3D	3E	3F	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F

16675

Brightness Adjustment

Format: 1B 17 *nn*

Range: $01 \leq nn \leq 05$

Description: Adjusts the brightness of the entire display. Individual characters or display positions will not be adjusted. On power up, the default brightness setting is 5 (100%).

Nn	Brightness
01	0%
02	25%
03	50%
04	75%
05	100%

Read Display ID Byte

Format: 1B 18

Returns: 0x8E

Description: This command is a request for the Retail VFD to return a identifier. The Retail VFD returns one byte (0x8E) that identifies the Retail VFD as a 4x20 with 5x7 dot matrix.

Read Display ID String

Format: 1B 19

Returns: 0x1D, "NCR_008-0221552,_F/W_V1.00.01"

Where 0x1D is a 1 byte string length indicator which indicates the length of the string that follows the string length indicator. For example, 1DH characters are sent after the string length indicator. Note: "_"indicates a space character (20H). The quotation marks "" are not part of the string and are not returned.

Description: This command is a request for the Retail VFD to return an ASCII string with detailed product information.

Display ESC Character

(Not a supported command)

Format: 1B 1B

Description: This command is a request for the ESC character to be displayed to the current cursor position.

Select Character Set n

Format: 1B 20 - 1B 21

Description: This set of command chooses one of the two supported internal character sets. Character set 1 is defined as Page 1(International), character set 2 is defined as Page 2(Japanese). Character set selection is dynamic. Host software can switch between character sets at any time. Switching between sets does not erase or change the display. This means characters from multiple character sets may be on a display. The default character set is Page 1(International).

Read Display Data String

Format: 1B 38

Returns: 0x50, "xxx---------xxxxx"

Where 0x50 is a 1 byte string length indicator which indicates the length of the string that follows the string length indicator. For example, 50H characters are sent after the string length indicator. Note: The quotation marks "" are not part of the string and are not returned.

Description: This command is a request for the Retail VFD to return an ASCII string which are being displayed on the Retail VFD.

Appendix A: Cables

Cable Index

Corporate ID	Part Number	Description
1416-C041-0030	497-0008623	Ethernet 10/100BaseT
1416-C262-0040	497-0404832	2010 coin dispenser
1416-C266-0040	497-0407943	9-pin female to 9-pin female RS-232
1416-C266-0152	497-0409379	7193 RS-232 50' 9-pin female to 9-pin female
1416-C320-0030	006-8601011	Cord set – SEV plug with straight "BM" power
1416-C321-0030	006-8601012	Cord set – United Kingdom plug with straight "BM" power
1416-C322-0030	006-8601019	Cord set – Australian cable with straight "BM" power
1416-C323-0030	006-8601010	Cord set – International plug with straight "BM" power
1416-C325-0030	006-1009037	Cord set – Power, US
1416-C337-0010	497-0407427	RS-232 interface, integrated
1416-C879-0010	497-0430266	RS-232 interface, remote, 1 m (Black)
1416-C879-0040	497-0430265	RS-232 interface, remote, 4 m (Black)
1416-C337-0040	497-0407429	RS-232 interface, remote
1416-C337-0152	497-0407430	RS-232 interface 50'

Corporate ID	Part Number	Description
1416-C359-0007	497-0408349	RS-232 (27") 9-pin female to 9-pin female
1416-C372-0006	497-0409394	Dual cash drawer (Y-cable)
1416-C373-0080	497-0409432	25' cable
1416-C374-0040	497-0409433	14' cable
1416-C408-0030	230-0113955	Power, SEV
1416-C409-0030	230-0113956	Power, UK rectangular
1416-C411-0030	006-1012224	Power, international
1416-C417-0040	497-0411815	Printer extender, 9-pin female to 25-pin female
1416-C418-0040	497-0411816	Printer extender, 25-pin male to 25-pin female
1416-C419-0030	250-0023191	Power, 120V twist lock
1416-C420-0030	008-0218043	Power – Japan w/ lock plug
1416-C422-0030	006-1002021	Power – US
1416-C464-0006	497-0413011	Backpack CD-ROM, Parallel
1416-C472-0006	497-0411000	Parallel interface
1416-C528-0010	497-0415949	USB, 1 meter
1416-C528-0040	497-0415950	USB, 4 meter

Appendix B: Feature Kits

7454 Kits

Below is a comprehensive list of the optional hardware Feature Kits that can be installed in the customer environment. Kit installation instructions (for those requiring instruction) are available on the Information Products web sites.

- *NCR Intranet:* http://inforetail.atlantaga.ncr.com

- *Internet:* http://www.info.ncr.com

To locate the installation guides on these sites:

1. Select **General Search**.

2. Select the **Kit Instructions** icon.

3. In the **Kit Title** field, enter the *Kit Title*.

   Example: Flash

   or

   In the **Kit Number** field, enter the *Kit Number*.

   Example: *7454-K040*

4. Select Search

   The file can be viewed online by left-mouse clicking on the pub title, or if you prefer to download the entire file you can right-mouse click on the title then select the *Save Target as...* option.

If you aren't sure of the title of number you can display all kits associated with a terminal product class by:

1. In the **Class** drop-down list, select the *Class* of the terminal.

   Example: *7454*

2. Select **Search.**

Kit Index

Kit Number	Part Number	Description
2010-K020-V001	497-0414206	Coin tray
2126-K161-V001	603-6211364	C-3 till
2126-K302-V001	603-6211312	C-3 till, lid with lock (2188-K202-V001)
2189-K052-V002	497-0009697	Slip tray (7450 G13)
2189-K053-V002	497-0009695	Coin tray (7450 G13)
2189-K060-V001	497-0009209	Till 2 ½
2189-K061-V001	497-0009210	Lid 2 ½
2330-K340-V001	497-0416464	WaveLAN II Turbo 11 Mbs PCMCIA card for USA & Canada
2330-K341-V001	497-0416466	WaveLAN II Turbo 11 Mbs PCMCIA card for Japan
2330-K350-V001	497-0412349	Range extender antenna
2336-K001-V001	497-0411988	Ethernet to RS-232 port server
2336-K007-V002	497-0421213	Informa CD-ROM
2336-K008-V001	497-0413014	USB to RS-232 port server
2336-K012-V001	497-0413710	USB to RS-232 2 port server
2336-K016-V001	230-0145388	Hand-held scanner (12 V power)
2336-K019-V001	497-0417069	Mouse, RS-232

Kit Number	Part Number	Description
2336-K022-V001	497-0417043	Teleqip coin dispenser base unit & RS-232 cable (100V)
2336-K030-V001	497-0417048	Coin cartridge – US 340403
2336-K031-V001	497-0417051	Coin cartridge – 1 dollar coin, US standard 340406
2336-K032-V001	497-0417053	Coin cartridge – Canadian 340405
2336-K033-V001	497-0417357	56 K modem, PCMCIA
2336-K455-V001	008-0221553	Remote 256x64 graphic VFD
2336-K600-V001	497-0414963	30 lb POS scale, USA
2336-K610-V001	497-0414964	15 kg POS scale, Canada
2756-K121-V001	497-0409421	Domestic power supply
2756-K122-V001	497-0409434	Y-cable adapter (mouse/keypad)
2756-K124-V001	497-0409422	International power supply
2756-K145-V001	497-0409666	Wall mount bracket for bump bar
2756-K152-V002	497-0409426	KDS cable
2756-K410-V001	497-0413066	SV 2000 CRT video controller
2756-K420-V001	497-0413064	KDS video add-on kit, domestic
2756-K421-V001	497-0413065	KDS video add-on kit, international
2756-K500-V001	497-0413062	KDS base kit, domestic
2756-K501-V001	497-0413063	KDS base kit, international
2756-K523-V001	497-0413067	RS-232 KDS controller
2756-K524-V001	497-0413068	RS-232 KDS controller, international
2756-K800-V001	497-0411009	Wall mount

Kit Number	Part Number	Description
2756-K801-V001	497-0411008	Ceiling mount
2757-K100-V001	497-0414898	Oasys KDS base kit
2757-K144-V001	497-0417729	Bump bar
2757-K145-V001	497-0414899	OAsys bump bar mounting bracket
2757-K150-V001	497-0423521	OAsys KDS base kit with AV1000 card
2757-K200-V001	497-0414900	OAsys video add-on kit
2757-K250-V001	497-0423522	OAsys KDS add-on kit with AV1000 card
2757-K300-V001	497-0414901	10 MB Ethernet card with software license
5945-K010-V002	497-0414162	Cable – 4 M RS-232 (9-pin D shell)
5945-K012-V001	497-0414163	Cable – 8 M RS-232 (9-pin D shell)
5945-K020-V001	497-0412046	Power supply (120 V, 60 Hz, US/Can)
5945-K025-V001	497-0412800	Power supply (220-240 V, 50 Hz)
5945-K030-V001	497-0412047	Generic keyboard overlay
5945-K150-V001	497-0416018	Electronic payment terminal with 2-track MSR
5945-K350-V002	497-0419112	Electronic payment terminal with 3-track MSR
5992-K095-V002	497-0421692	Stylus
5992-K150-V005	497-0423889	Signature capture plus with 2-track MSR
7156-K270-V001	497-0408657	Switch button (20 pieces)

Kit Number	Part Number	Description
7156-K280-V001	497-0408653	Slip table
7158-K301-V001	497-0411975	Power supply (55 W)
7401-K021-V001	497-0422274	32 MB SDRAM service kit
7401-K024-V001	497-0414201	64 MB SDRAM service kit
7401-K025-V001	497-0414202	128 MB SDRAM service kit
7401-K051-V001	497-0413160	Large capacity hard drive
7401-K060-V001	497-0412202	Dual PCMCIA port
7401-K070-V001	497-0416029	Dual RS-232
7401-K200-V001	497-0412200	High fidelity speaker module
7401-K533-V001	497-0411713	Wall mount bracket (tilt mount)
7452-K183-V001	497-0415241	32 MB flash disk
7453-K002-V001	497-0407633	Modular cash drawer – 2260
7453-K007-V001	497-0414767	Till with lid and lock
7453-K641-V003	497-0413391	Serial modems for 7161 and 7193 printers
7454-K005-V001	497-0424210	Modular cash drawer – midrange, gray 105, with anti-temper drawer flange
7454-K040-V001	497-0411474	8 MB flash disk
7454-K101-V002	497-0412005	MSR 3 track ISO
7454-K102-V001	497-0412299	MSR JIS 2 track
7454-K104-V001	497-0427614	3-Track ISO MSR in Black
7454-K451-V003	497-0412278	4x20 low post integrated customer display in gray (G105)

Kit Number	Part Number	Description
7454-K452-V001	497-0413077	4x20 high post integrated customer display in gray (G105)
7454-K453-V001	497-0412209	Remote post 4x20 customer display (bi-directional) in gray (G105)
7454-K454-V001	497-0427548	4x20 high post integrated customer display in charcoal gray (CG01)
7454-K455-V401	497-0427547	4x20 low post integrated customer display in charcoal gray (CG01)
7454-K456-V001	497-0414192	4x20 low post remote customer display in gray (G105)
7454-K457-V001	497-0427615	4x20 high post external customer display in charcoal gray (CGT01)

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