VeriFone®

Omni 3200

Reference Manual

VeriFone Part Number 19134, Revision B

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Omni 3200 Reference Manual
VeriFone Part Number 19134, Revision B

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About This Manual

The *Omni 3200 Reference Manual* contains information about the Omni 3200 terminal that is required by three distinct audiences:

* Application programmers who develop and test new applications for the Omni 3200 terminal.

* Technicians who configure Omni 3200 terminals, and download specific applications into the terminal memory, in preparation of the terminal's being deployed at end-user sites.

* Technicians, managers, or other designated persons who administrate and maintain Omni 3200 terminals at end-user installations.

To assist each of these audiences in performing their respective jobs, the organization and content of this manual is strongly task-oriented. Information is organized in the following sections:

* Setting Up and Installing the Terminal. You can find this same information in the Omni 3200 Installation Guide. It is included in this manual for reference, and to provide a concise introduction to Omni 3200 features.

* Using the Terminal Keys. This section provides more detailed information than does the Omni 3200 Installation Guide about using the terminal keypad and function keys to enter data. The functions described are generic, as opposed to application-specific.

* Performing System Mode Operations. The terminal functions described in this section are available to those who can access System Mode by entering the correct System Password.

   Procedures for performing tests, downloads, and diagnostic procedures are either "local" (with no external connection required) or "remote" (where an external connection via cable or modem is required).

Procedures for performing all local System Mode functions are described in detail. To avoid redundancies, remote procedures are introduced in this section, but are described in detail later on in the sections on downloading and remote diagnostics.

- <u>Performing Downloads</u>. This section contains detailed descriptions of the procedures required to perform all types of downloads, or uploads, of Omni 3200 applications, terminal operating systems, and other data transfers.

- <u>Remote Diagnostics and Debugging</u>. This section briefly describes how to how to perform remote diagnostics on an Omni 3200 terminal from a host computer using a dial-up telephone connection or a direct connection. It also describes how to download and test (debug) an application program that is running on the Omni 3200 terminal.

- <u>Troubleshooting and Service</u>. This section describes possible problems or malfunctions of the Omni 3200 terminal, and gives recommendations about how to fix them. It also includes information about terminal maintenance, and how to obtain technical assistance and other services from VeriFone.

The following appendices provide supplemental information:

- <u>Appendix A</u> lists and describes all standard English-language system prompts and error messages.

- <u>Appendix B</u> is the standard ASCII table for the Omni 3200 printer.

- <u>Appendix C</u> is a glossary of definitions of product-specific terms used in the Omni 3200 documentation, as well as of relevant industry-standard terms.

The manual concludes with an Index to serve as a quick-reference tool for locating the information you need. In the PDF version of this document, entries in the Table of Contents, as well as the page numbers of Index entries, contain hyperlinks to corresponding pages in the document.

Typographical Conventions

Example	Description
`char *strng;`	The `Courier New` font is used for source code and programming examples.
fprint( )	When source code, variable names, and other C language descriptions are shown outside the context of a programming example, the *Times New Roman italic* font is used.
	Italic is used in text to denote document or section titles, and for other cross-references.
`%[*][width]`	Items in braces note optional usage, such as an optional function parameter or a command line option.
`[,argument ...]`	An ellipsis (a series of three dots, either in a column, or in a line) signifies that an item may be repeated any number of times.
8Ah through 8Fh	Hexadecimal values are denoted with a lower-case 'h'.
CONFIG.SYS	Terminal file system or terminal-related objects are shown in ALL CAPS.
[ALPHA]	Keys on the Omni 3200 terminal keyboard appear between square brackets.
UNIT SEND	The Ariel type font is used to identify messages or prompts that appear on the Omni 3200 display.

All C language source code characters are case sensitive. For example *fprint( )* and *FPRINT( )* are different functions. All source code punctuation must be included as shown.

Setting Up the Terminal

Setup Procedure

The following procedure, which consists of seven steps, explains how to set up and install the Omni 3200 terminal (see Figure 1). It helps you select a location for the terminal, establish cable and telephone line connections, and configure optional peripheral devices, if necessary. Completing this procedure is, in most cases, a necessary prerequisite to performing the various tasks described in this manual.

Figure 1   Omni 3200 Terminal

Note: This same procedure description is also available to end users in the *Omni 3200 Installation Guide* (VeriFone part number 05996).

Step 1: Select a Location for the Terminal

Select a location for the terminal that is convenient for the task or tasks you must perform, and which offers adequate ventilation and protection.

Caution: The Omni 3200 terminal is designed for indoor use only.

Place the Omni 3200 on a flat surface such as a table or countertop. Avoid areas with:

- Excessive heat or dust

- Oil or moisture

- Devices that cause excessive voltage fluctuations or electrical noise, such as air conditioners, fans, electric motors, neon signs, or high-frequency security devices

- Direct sunlight or objects that radiate heat

The terminal should also be conveniently located in relation to telephone line and power connections.

The two power pack cables are each about 1.8 meters (6 feet) long and the telephone line cord is about 2.1 meters (7 feet) long. The telephone line connection for the Omni 3200 requires a telephone base unit or a modular telephone company wall jack.

Warning: Do not use this product near water, including a bathtub, wash bowl, kitchen sink, or laundry tub. Do not use in a wet basement or near a swimming pool. Avoid using a telephone (other than a cordless type) during an electrical storm.

Step 2: Unpack the Shipping Carton

Note: Carefully inspect the shipping carton and its contents for shipping damage (see Figure 2). If the terminal, or any other component, appears damaged, file a claim immediately with the shipping company and notify VeriFone. Do not use a damaged terminal.
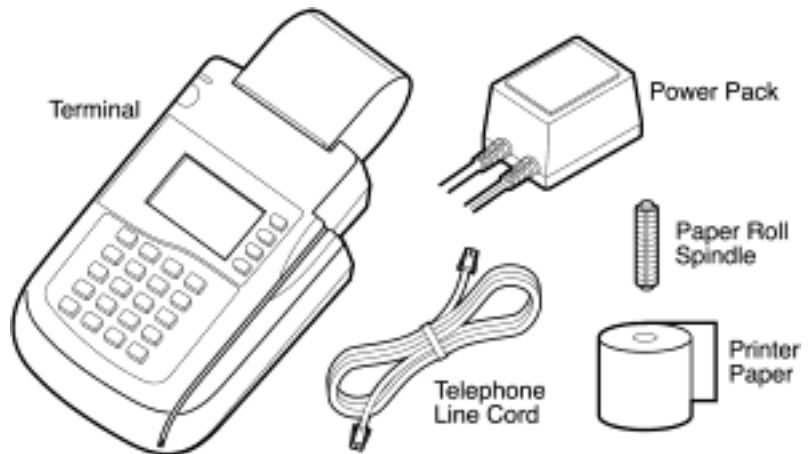
Figure 2   Omni 3200 Product Components

Follow these steps to unpack the carton:

1. With the shipping carton right side up, open the top and remove all items from the carton:

    -   Omni 3200 terminal

    -   Power pack

    -   Telephone line cord

    -   Roll of thermal printer paper

    -   Plastic paper roll spindle

Note: The roll of thermal printer paper and the paper roll spindle may have been installed in the Omni 3200 terminal prior to shipment.

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2.   Remove any protective plastic wrapping from the terminal or other components and place them on a table or countertop.

3.   Save the shipping carton and packing material for repacking or moving the terminal in the future.

Step 3: Examine Terminal Features

Before you continue the setup procedure, please take a moment to note the important features of the Omni 3200 (see Figure 3).
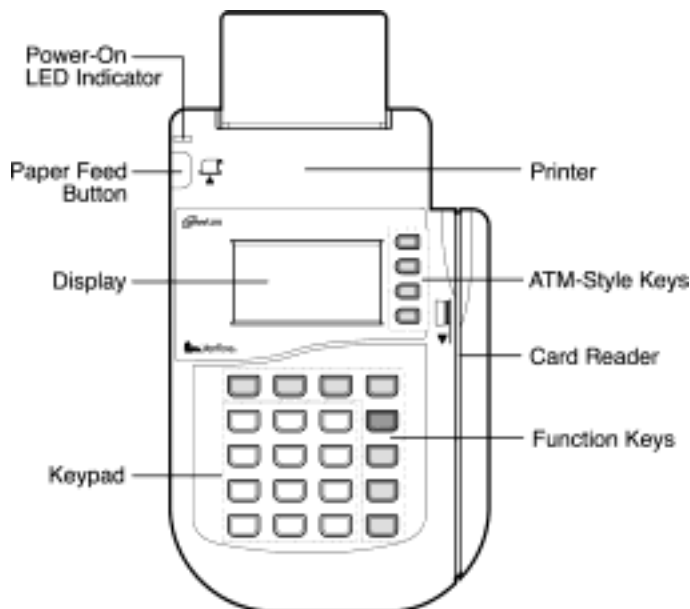
Figure 3   Features of the Omni 3200 Terminal

General Features

Viewing the top surface of the Omni 3200 terminal, you will notice the following features:

- In the center of the terminal, a display screen with a non-removable, clear protective cover.

- 24 keys, arranged in groups (see Figure 4):

  - A 12-key, telephone-style keypad

  - Eight function keys (four to the right of the 12-key keypad, and four above the keypad)

  - Four ATM-style keys to the right of the display
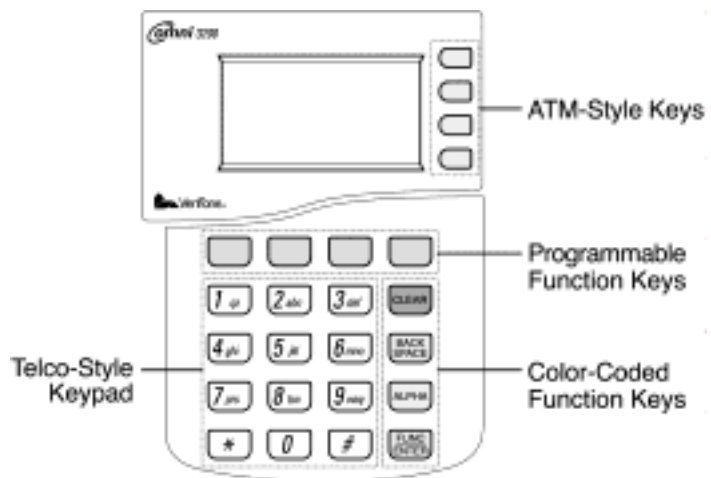
Figure 4   Omni 3200 Keypad and Function Keys

- A magnetic stripe card reader, built in to the right side of the terminal. A graphical icon, shown to the right, indicates the proper card position and swipe direction (see Figure 5).
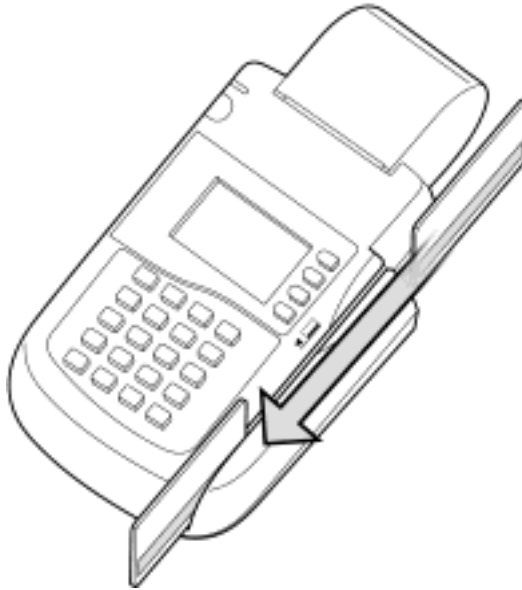
Figure 5   Using the Omni 3200 Card Reader

• A thermal printer, fully integrated into the upper part of the terminal. In the top left corner of the terminal is a small LED power-on and 'no paper' indicator, and below, a paper feed button. A graphical icon, shown to the right, indicates the location and function of the paper feed button.

Connection Ports on the Back Panel

If you turn the terminal around and view it from the back, you will notice five jacks, or ports, that are used to connect the Omni 3200 to a telephone line, to optional external devices, and to a power source (see Figure 6).

Four ports are located below the paper roll cradle and one is located to the right of the cradle. These ports are described in left-to-right order below.
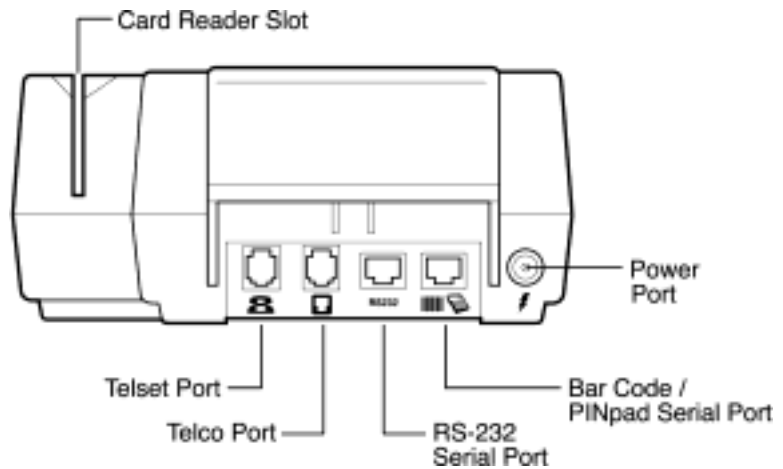
Figure 6   Omni 3200 Connection Ports

- At the far left of the back panel are two RJ11-type modular jacks (parallel ports) for connecting the terminal to a telephone line:

  The first port is identified by a telephone-shaped 'Telset' icon (shown to the right). You use this Telset port to connect the Omni 3200 to a telephone base unit.

  The second telephone line port is identified by a jack-shaped 'Telco' icon (shown to the right). You use this Telco port to connect the Omni 3200 to a telephone company wall jack.

- Two RJ45-type modular jacks (serial ports) for connecting optional peripheral devices:

  The first serial port is identified by an 'RS232' icon (shown to the right). You use this port to connect a VeriFone CR 600 check reader, or other peripheral device.

  The second serial port is identified by 'Bar Code and PINpad' icons (shown to the right). You use this port to connect a PINpad, smart card reader/writer, or bar code wand.

•   On the lower right-hand side of the back panel, is a round port for connecting the terminal to a power source. This port is identified by an 'electrical power' icon (shown to the right).

Step 4: Connect the Terminal to a Telephone Line

To process electronic transactions, the terminal automatically dials up and communicates with a host computer over a telephone line. You can connect the Omni 3200 to a telephone line in one of two ways: with a pass-through connection or with a direct connection:

•   <u>Pass-through connection</u>. The telephone line cord runs from the Telset port on the back of the terminal to a RJ11-type jack located on a standard telephone base unit.

    The telephone you use for a pass-through connection must be fully functional and must have two RJ11-type modular jacks on its base: one for the direct connection of the telephone and another for the Omni 3200 connection.

    With a pass-through connection, the line is busy when the terminal is using it to dial in to a host computer, or when a host computer is dialing in to the terminal.

•   <u>Direct connection</u>. The telephone line cord runs from the Telco port on the back panel of the terminal directly to a RJ11-type telephone company wall jack.

Set Up a Pass-Through Telephone Connection

To set up a pass-through telephone line connection from the Omni 3200 to a telephone base unit (see Figure 7):

1. Insert the connector on one end of the telephone line cord into the Telset port on the back panel of the terminal. (The Telset port is identified by the icon shown to the right.)

2. Insert the connector on the other end of the telephone line cord into the empty RJ11-type modular jack located on the telephone base unit.

Caution: If you use a pass-through connection for your terminal, do not attempt to make a normal telephone call while the terminal is processing a transaction. Lifting up the handset may disrupt the carrier signal and cause transaction processing to fail.
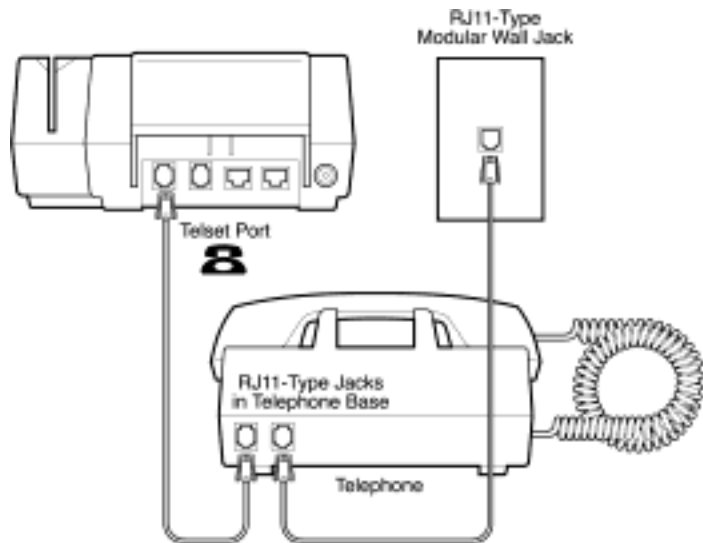
Figure 7   Pass-Through Telephone Line Connection

Set Up a Direct Telephone Connection

To set up a direct telephone line connection from the Omni 3200 terminal to a telephone company wall jack (see Figure 8):

1. Insert the connector on one end of the telephone line cord into the Telco port on the back panel of the terminal. (The Telco port is identified by the icon shown to the right.)

2. Insert the connector on the other end of the telephone line cord into a RJ11-type telephone company wall jack. (If you do not have this type of modular wall jack, you can obtain an adapter from a local business supply store.)
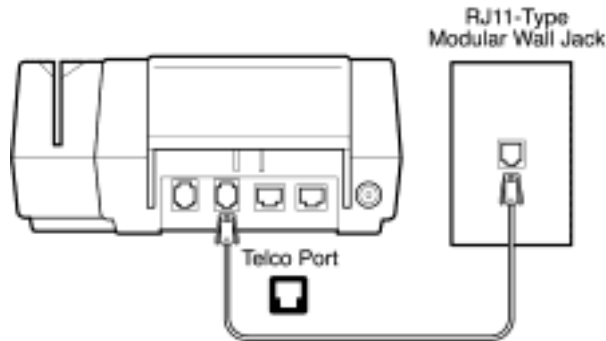
Figure 8   Direct Telephone Line Connection

Step 5: Connect Optional Device(s)

The Omni 3200 supports the complete line of VeriFone peripheral devices designed for use with Point-Of-Sale terminals. Using the two RJ45-type serial ports on the back panel of the terminal, you can connect up to two optional devices. These optional devices include various types of PINpads for entering customer PIN numbers, check readers, smart card reader/writers, and bar code wands.

Brief descriptions of how to connect various peripheral devices to the Omni 3200 terminal are provided below. For complete information about installing and using an optional device, please refer to the user documentation supplied with that device.

Warning: Before you connect a peripheral device to the Omni 3200, be sure the terminal is not connected to a power source. If necessary, unplug the power cable from the power port on the back panel of the terminal.

Connect a PINpad

To connect a PINpad to the Omni 3200 terminal (see Figure 9 and Figure 10):

1. If necessary, insert the small modular plug on one end of the PINpad cable into the modular jack on the PINpad.

2. If you are installing a PINpad 101, PINpad 201, or PINpad 1000, position and insert the grommet to secure the cable connection.

3. Insert the larger RJ45-type connector on the other end of the PINpad cable into the 'Bar Code/PINpad' serial port on the back panel of the Omni 3200 terminal.
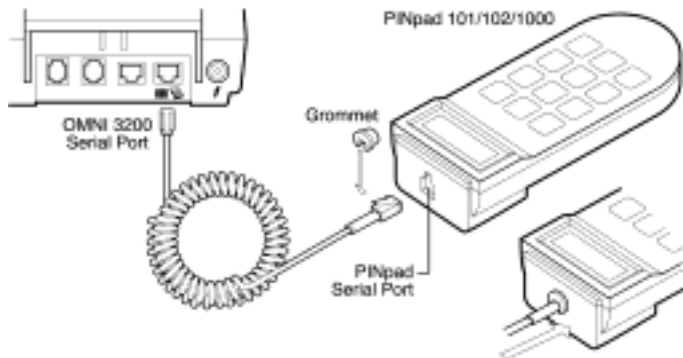
Figure 9   PINpad 101/102/1000 Connection
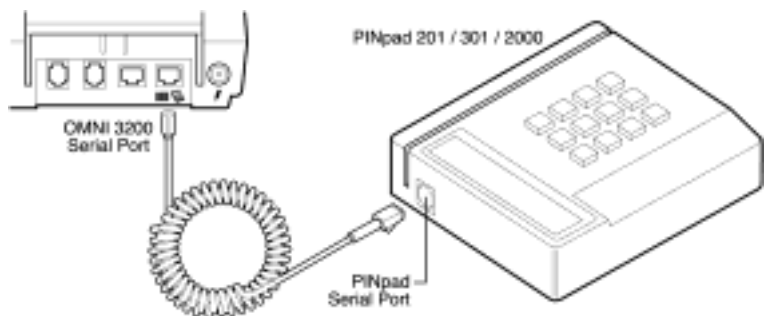
Figure 10 PINpad 201/301/2000 Connection

Connect a CR 600 Check Reader

Warning: Check readers may require a separate power source. Before you connect a check reader, or a similar device, to the Omni 3200 terminal, be sure the device is not connected to a power source. If necessary, disconnect the power pack cable from the device.

To connect a CR 600 check reader (see Figure 11):

1. If the cable is not already connected to the check reader, insert the small modular plug on one end of the cable into the modular jack on the check reader.

2. Insert the larger RJ45-type connector on the other end of the cable into the 'RS232' serial port on the back panel of the Omni 3200 terminal.
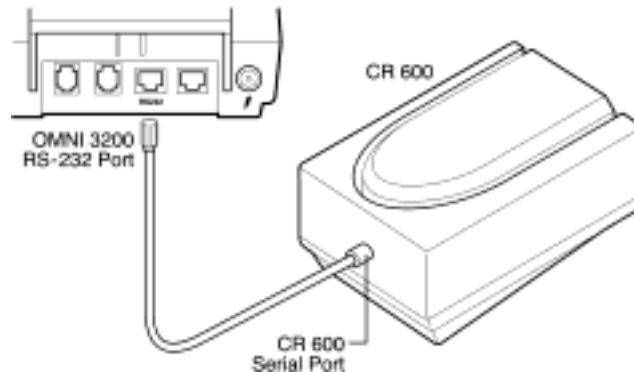
Figure 11 CR 600 Check Reader Connection

When you have completed the next step of the installation procedure, "Step 6: Connect the Terminal Power Pack," you may then connect the check reader to a power source.

Connect a Smart Card Reader/Writer or PINpad 501

To connect a SC 4xx or SC 5xx smart card reader/writer, or a PINpad 501, to the Omni 3200 terminal (see Figure 12):

1. If a cable is not already connected to the smart card reader/writer or PINpad 501, insert the small modular plug on one end of the interface cable into the modular jack on the optional device.

2. Insert the larger RJ45-type plug on the other end of the interface cable into the 'Bar Code/PINpad' serial port on the back panel of the terminal.
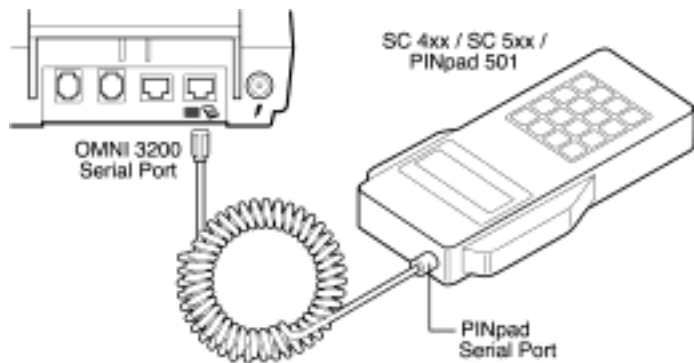
Figure 12 SC 4xx, SC 5xx, and PINpad 501 Connection

Connect a Bar Code Reader

To connect a VeriFone bar code reader, or wand, insert the RJ45-type plug on the end of the cable into the 'Bar Code/PINpad' serial port on the back panel of the terminal (see Figure 13).
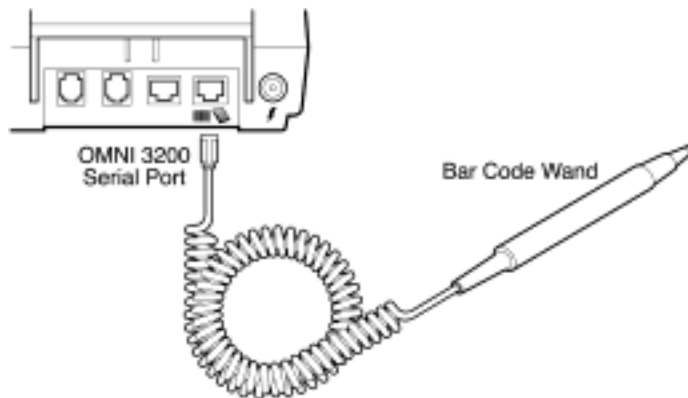
Figure 13 Bar Code Reader Connection

Step 6: Connect the Terminal Power Pack

Warning: Do not plug the power pack into an outdoor outlet or operate the terminal outdoors. Also, disconnecting the power source during transaction processing may cause data files stored in the terminal memory to be lost.

To connect the Omni 3200 terminal to a power source:

1. Insert the barrel-shaped connector on the end of one power pack cable into the round power port on the back panel of the terminal (see Figure 14). The power port is identified by the 'electrical power' icon, shown to the right.

2. Plug the metal prongs on the end of the other power pack cable into an indoor electrical power outlet.

    When you connect the power, the Omni 3200 display screen, and the green LED at the top left corner of the terminal, light up. The LED should now be flashing off and on, indicating that there is no paper in the printer.
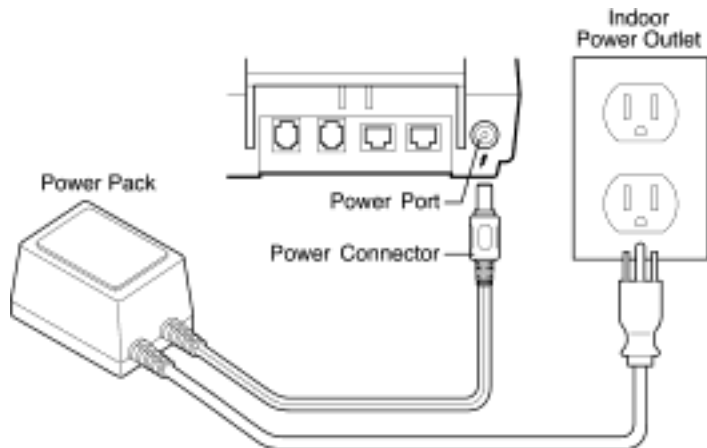
Figure 14 Omni 3200 Power Pack Connection

Step 7: Install a Paper Roll in the Printer

A fast, quiet thermal printer is built in to the Omni 3200. Because the printer receives power directly from the terminal, there are no additional cables to connect (see Figure 15).
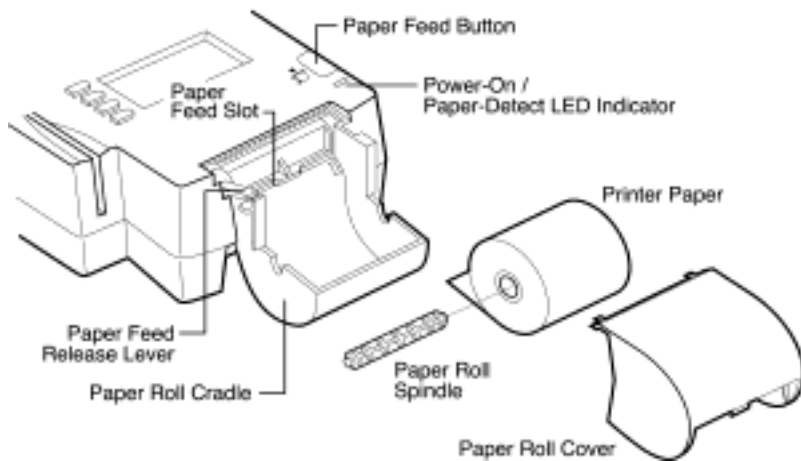
Figure 15 Thermal Printer Features

About Thermal Printer Paper

The Omni 3200 printer uses single-ply, thermal-sensitive roll paper that is 58 millimeters (2.25 inches) wide and about 25 meters (82 feet) long. Before you can process transactions that require a receipt or record, you must install a roll of paper in the printer. This procedure is described below.

Note: You can order thermal printer paper directly from VeriFone. Because the Omni 3200 uses standard size paper rolls, you can also purchase paper in bulk from local business supply stores.

> **Caution:** Because impact, friction, temperature, humidity, light, and oil affect the coloring and storage characteristics of thermal paper, handle this type of paper carefully. Never load a roll of paper that has any folds, wrinkles, tears, or holes at edges or in the printing area. For best results, cut the leading edge of the paper, instead of tearing it, before feeding it into the printer.

Installing a Paper Roll

To install a roll of thermal printer paper in the Omni 3200:

1. Be sure the terminal is connected to a power source. (The green LED indicator should be blinking off and on.)

2. Remove the paper roll cover from the top of the terminal by lifting up on the back of the cover.

3. Remove the protective strip from a new roll of paper and cut a clean, straight edge on the leading end of the paper.

4. Holding the roll with the paper feeding from the bottom of the roll, slowly guide the leading end into the paper feed slot (see Figure 15). When the sensor detects the paper, the feed mechanism starts automatically, advancing the paper into the printer. If necessary, press the paper feed button until the paper emerges from the slot below the serrated metal strip.

5. Insert the plastic spindle into the hole in the paper roll. Then, place the spindle and roll into the paper roll cradle so the ends of the spindle rest securely in the two slots.

6. If necessary, hold down the paper feed button until about 5 centimeters (2 inches) of paper emerge from the printer.

7. Replace the paper roll cover by inserting the two front tabs first and then lightly pushing down the back until it snaps in place. Lift up the edge of the paper when you install the paper roll cover so that it rests on top of the cover.

Using the Terminal Keys

When you have completed the setup procedure described above, it is useful to familiarize yourself with the operational features of the Omni 3200 front panel, and with using the terminal keypad to enter data, before proceeding with other tasks.

This section describes how to use the 'core keypad,' which consists of the 12-key Telco-style keypad and the four color-coded function keys to the right of this keypad (see Figure 16). Using these 16 keys, you can perform all of the data entry tasks described in this manual.

Functions that may be assigned to the four programmable function keys directly above the core keypad and to the four ATM-style keys to the right of the Omni 3200 display are application-specific. For this reason, these two key groups are not discussed in this manual.
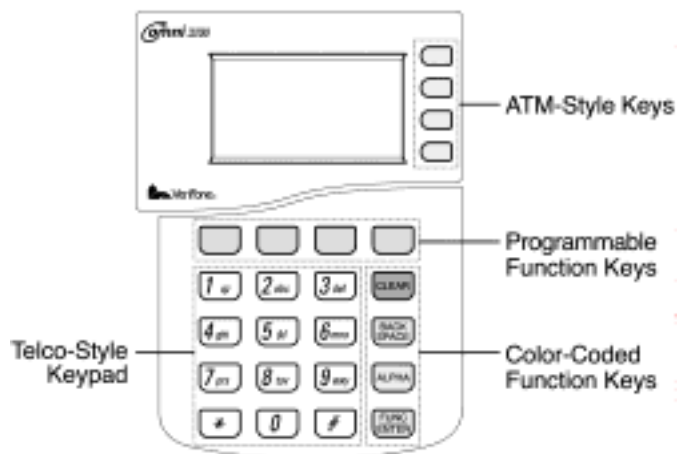
Figure 16 Front Panel Key Arrangement

Data Entry Modes

Before you can use the keys on the front panel to enter ASCII characters, the Omni 3200 must be in a mode that allows keyed data entry. There are two terminal operating modes, each of which lets you press keys to enter data under specific circumstances:

- Normal Mode. The terminal operating mode in which an application program is present in the SRAM and is currently executing.

- System Mode. A special, password-controlled terminal operating mode that is used to perform a variety of test and configuration procedures.

When you connect an Omni 3200 terminal to a power source, the application program stored in SRAM starts executing and the terminal automatically enters Normal Mode. The application then controls how terminal keys, including the programmable function keys and ATM-style keys, are used to process transactions and when you can use specific keys to type characters or respond to prompts.

When you connect an Omni 3200 terminal to a power source which does not yet have an application stored in SRAM, the system prompt DOWNLOAD NEEDED is displayed. You can then proceed to enter System Mode by pressing the [CLEAR] key, configure the terminal as required, and perform the required download.

To enter System Mode after an application has been loaded into the terminal memory, you must press a special key combination and then type in the required System Password. While in System Mode, you can only use the 16-key core keypad to enter characters and to respond to prompts. Key entries are controlled by the specific System Mode function you select.

When an Omni 3200 terminal is running in Normal Mode, entering System Mode stops the application. When you exit from System Mode, the application is automatically re-started, Normal Mode is entered, and data entry using the terminal keys is again controlled by the application program.

The Core Keypad

The core keypad is a 16-key arrangement which consists of a 12-key Telco-style keypad and four color-coded function keys located to the right of this keypad (see Figure 16).

Note: The System Mode functions described in the next section of this manual require that you enter numbers, letters, or symbols using the core keypad.

Using the core keypad, you can enter up to 50 ASCII characters, including the letters A–Z, the numerals 0–9, and the following special characters: * , ' " - . # : ! + @ = & and [space].

Function Key Descriptions

Note: The specific action that is performed when you press one of the following function keys depends on the terminal operating mode and context in which you press it. The following descriptions are provided solely to acquaint you with some general characteristics of these function keys before presenting more detailed System Mode procedure descriptions.

[CLEAR]

In Normal Mode — when the terminal's application is loaded and running — pressing the [CLEAR] key usually has the same effect as pressing the Escape (Esc) key on a PC. That is, it terminates the current function or operation.

In System Mode, you use the [CLEAR] key, alone and in key combinations, to perform a variety of functions. The most common use of the [CLEAR] key in System Mode is to exit from System Mode and return to Normal Mode or to exit a System Mode function and return to the System Prompt. The specific effect of pressing [CLEAR] depends on which System Mode function you select.

[BACKSPACE]

In Normal Mode, the [BACKSPACE] key is commonly used to delete a number, letter, or symbol that is typed on the terminal's display screen. You press [BACKSPACE] one time to delete the last character typed on a line. To delete additional characters, moving from right to left, you press the [BACKSPACE] key multiple times, once for each character.

In System Mode, you use the [BACKSPACE] key in the same way. That is, to delete characters you have typed on the display screen. The specific effect of pressing [BACKSPACE] depends on which System Mode function you select.

[ALPHA]

In Normal Mode, the [ALPHA] key is similar to the [SHIFT] key on a typewriter. That is, you can use it to enter one of the two or more characters or symbols that are assigned to individual keys on the 12-key Telco-style keypad. To use the [ALPHA] key to enter up to 50 different ASCII characters, follow this procedure:

1. Press the key on the 12-key keypad which shows the letter or symbol you want. (For example, you would use the [2] key to type the letters A, B, or C.) The number (1–9 or 0) or the symbol (* or #) you pressed is now displayed.

2. Press the [ALPHA] key once to display the first letter. Continuing our example, [2] [ALPHA] displays the letter A.

3. Continue pressing the [ALPHA] key as many times as required to display the character you want. For example, you would press the [2] key and then the [ALPHA] key once to display A, twice to display B, or three times to display the letter C. If you press [ALPHA] one more time, the letter A is displayed again.

Note: If you firmly press and hold down one of the keys on the 12-key keypad without using the [ALPHA] key, the same character repeats until you stop pressing the key. For example, if you press only the [2] key and hold it down, you get '2222222...'.

If two or more characters are displayed on the Omni 3200 screen, pressing the [ALPHA] key changes the last character on the line to the next letter, number, or symbol in the key sequence. For example:

Current display:	A5C*2
[ALPHA]	A5C*A
[ALPHA]	A5C*B
[ALPHA]	A5C*C
[ALPHA]	A5C*2

Table 1 below provides some additional examples of how to use the [ALPHA] key to ASCII characters from the 12-key Telco-style keypad.

Table 1   Example [ALPHA] Key Entries

Desired Character	Key(s) to Press
2	[2]
A	[2] [ALPHA]
S	[7] [ALPHA] [ALPHA] [ALPHA]
!	[#] [ALPHA]
[Space]	[0] [ALPHA] [ALPHA] (A blank space [SP] is entered in the character position.)
Comma (,)	[*] [ALPHA]
Plus sign (+)	[0] [ALPHA] [ALPHA] [ALPHA]

Table 2 below lists all of the ASCII characters you can type using the [ALPHA] key and the 12-key Telco-style keypad:

Table 2   Using the [ALPHA] Key and the 12-Key Keypad

Key to Press	Without Pressing [ALPHA] Key	Press [ALPHA] Key One Time	Press [ALPHA] Key Two Times	Press [ALPHA] Key Three Times
1 QZ	1	Q	Z	.
2 ABC	2	A	B	C
3 DEF	3	D	E	F
4 GHI	4	G	H	I
5 JKL	5	J	K	L
6 MNO	6	M	N	O
7 PRS	7	P	R	S
8 TUV	8	T	U	V
9 WXY	9	W	X	Y
0 -SP	0	–	[space]	+
*	*	,	'	"
# ,' "	#	!	:	@

NOTE: The [#] key also supports two additional characters, = and &. To enter =, press [#] once and then press [ALPHA] four times. To enter &, press [#] once and then press [ALPHA] five times.

Note: In System Mode, you use the [ALPHA] key to key in the default System Password, to enter a new System Password, and in several other ways, depending on which System Mode function you select.

[FUNC/ENTER]

In Normal Mode, the [FUNC/ENTER] key is generally used in the same was as the Enter key on a PC. That is, to end a procedure, confirm a value or entry, answer 'Yes' to a query, or to select a displayed option.

In System Mode, you similarly press [FUNC/ENTER] to begin a selected procedure, to step forward or backward in a procedure, and to confirm data entries. The specific effect of the [FUNC/ENTER] key depends on which System Mode function you select.

Viewing Information Wider Than the Display

Note: The scrolling function described below can only be used in system modes and procedural contexts where the terminal firmware or application software permits data entry.

In Normal Mode, if a line of information that is displayed on the screen is too long to read completely, you can view the text that is currently "hidden" by scrolling the display to the left or right:

• To scroll the display to the right, press the [#] key.

• To scroll the display to the left, press the [*] key.

To scroll more than one character at a time, hold the [#] or [*] scroll key down firmly until the information you want to view is displayed.

In System Mode, the [#] and [*] keys may have different effects, depending on which System Mode function you select:

For example, the scrolling keys work as described above when you use the [7] key function to edit records in the terminal's CONFIG.SYS file. If, however, you key in characters beyond the right margin of the display area during another System Mode function, you will soon hear an 'error beep.' (The error beep has a slightly lower tone frequency than the normal key entry beep.)

Performing System Mode Operations

This section describes a category of terminal operations called System Mode functions. System Mode functions are used exclusively by those responsible for configuring, deploying, and managing Omni 3200 terminal installations in the field.

When to Use System Mode

You can use System Mode functions to perform different subsets of related tasks:

- Application programmers: To configure a test terminal, download versions of the Omni 3200 application program you are developing, and test and debug the application until it has been validated and is ready to be downloaded to other terminals.

- Those who deploy Omni 3200 terminals to end-user sites: To perform specific tasks that are a prerequisite to deploying a new Omni 3200 terminal in the field, including configuring the terminal, downloading application software, and testing the terminal prior to deployment.

- Terminal administrators or site managers: To change passwords, perform routine tests and terminal maintenance, and configure terminals for downloads by telephone and for remote diagnostics.

To perform the subset of tasks that corresponds to your job, you select the appropriate System Mode function(s) and execute the corresponding procedure(s), as described in the subsections below.

Verifying Terminal Status

The Omni 3200 terminal you are working with may, or may not have an application program running on it. When you have set up the terminal as described in Section 1, and the terminal is connected to a power source, follow these simple guidelines to verify the terminal's status in relation to its software and current operating mode:

- If an application program has not yet been downloaded into the terminal's SRAM, the message DOWNLOAD NEEDED is displayed on the terminal's screen. From this point, you can press the [CLEAR] key to enter System Mode and perform the required application download.

- If an application program has already been downloaded into the terminal SRAM, an application-specific Application Prompt is displayed. The application is running and the terminal is in Normal Mode. If all installation steps have been completed, the terminal is now ready to process transactions.

The System Password

To prevent the unauthorized use of System Mode functions, the Omni 3200 terminal firmware requires that you key in a System Password each time you enter System Mode.

The default System Password, which is pre-set at the factory, is:

[1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1]

Note: For terminals that do not yet have an application program stored in their memory, password entry is not required to enter System Mode. Simply press the [CLEAR] key when the message DOWNLOAD NEEDED is displayed.

When you key in the correct password, the terminal enters System Mode and the System Prompt is displayed. The System Prompt consists of two parts: the word SYSTEM= and the terminal's firmware version ID, in VPQXXYYZ format. (For more information about the System Prompt, see the section entitled "The System Prompt" below.)

In System Mode, you can the select a procedure to change the default password to a unique and more secure password. When you set a new System Password, be sure to keep a copy of the new password in a secure place.

A valid System Password may consist of from one to ten alphanumeric characters. You can change the system password at any time, provided you know what the current password is.

When you key in the System Password to enter System Mode, an asterisk (*) appears on the display for each character you type, obscuring the password you are entering from general view. However, when you press the [ALPHA] key as part of a System Password, no asterisk is displayed.

Note: Some application program downloads automatically reset the System Password.

Caution: If you change the System Password and then forget it, there is no method to determine what the forgotten password is. Losing or forgetting the password will block access to System Mode functions and prevent you from requesting a download, performing remote diagnostics, or changing any of the information already stored in memory. The terminal can, however, continue to process transactions in Normal Mode. If you forget or lose the password to your terminal, please contact your local VeriFone representative for assistance.

The System Prompt

When you key in the correct password, the terminal enters System Mode and the System Prompt is displayed. When you see the System Prompt, the terminal is ready to accept entries from the core keypad.

The standard two-part format of the System Prompts is as follows:

SYSTEM= VPQXXYYZ

where,

SYSTEM= is a generic prefix for the System Prompt,

and

VPQXXYYZ identifies the version of Omni 3200 system firmware that is stored in the terminal's flash EPROM,

where,

V is the TXO indicator

P is for Omni 3200

Q is the feature specifier

XX is the two-digit operating system version number

YY is the two-letter country specifier, and

Z is the one-digit country release ID.

Note: Two example Omni 3200 firmware version IDs are VPQ47AO0 ("all open" version) and VPQ47US1 (U.S. version).

List of System Mode Functions

Table 3 is a complete list of the local and remote terminal functions you can access in System Mode.

Table 3   System Mode Functions

Key	Function Description	Type
[1]	Display the creation date, two-character originator ID (usually the initials of a person's first and last name), and the 4-digit TXO interpreter version number.	Local
[2]	Display the terminal's Unit ID (PTID) and SRAM size.	Local
[3]	Initiate a display test.	Local
[4]	Initiate system diagnostic tests.	Local
[5]	Set the date and time.	Local
[6]	Display all prompts and error messages stored in firmware in a continuous sequence.	Local
[7]	Edit a keyed file (such as CONFIG.SYS)	Local
[8]	Initiate a remote diagnostics session over a telephone line.	Remote
[9]	Test the integrated printer.	Local
[0]	Initiate a software download over a telephone line.	Remote
[ALPHA]	Change the system password.	Local
[BACKSPACE]	Initiate destructive memory test. Caution! This test erases the terminal's application memory.	Local
[*]	Upload software to another terminal.	Remote
[#]	Receive a direct software download.	Remote
[CLEAR]	Exit System Mode and restart the application program.	Local

Local and Remote Functions

The System Mode functions that are available on an Omni 3200 terminal can be divided into the following two categories or types:

- Local functions. Local functions address a standalone terminal and do not require communication or data transfers between the terminal and another computer or terminal.

  You use local System Mode functions to configure, test, and display information about the terminal.

- Remote functions. Remote functions require communication between the terminal and a host or download computer (or another terminal) over a telephone line or a cable connection.

  You use remote System Mode functions to download application software to the terminal, upload software from one terminal to another, and to perform remote diagnostics over a telephone line.

This chapter contains descriptions of how to perform local System Mode functions. Local System Mode functions include the following:

Key	System Mode Function
[1]	Display EPROM information
[2]	Display Unit ID and SRAM size
[3]	Initiate display test
[4]	Initiate System Mode diagnostics
[5]	Set the date and time
[6]	Display messages and prompts
[7]	Edit a keyed file (CONFIG.SYS)
[9]	Test the integrated thermal printer
[ALPHA]	Change the System Password
[BACKSPACE]	Initiate a destructive memory test
[CLEAR]	Exit and restart the application

Because additional information is required to set up and perform remote operations such as downloads and remote diagnostics, remote System Mode functions are described in other sections: "Performing Downloads" and "Remote Diagnostics and Debugging."

• The following three procedures are described in the section, "Performing Downloads:"

[0]   Perform a download by telephone

[*]   Upload software to another terminal

[#]   Receive a direct software download

• The following procedure is described in the section, "Remote Diagnostics and Debugging:"

[8]   Initiate remote diagnostics

About System Mode Procedure Descriptions

The procedure descriptions provided below explain how to perform each of the System Mode functions listed in Table 3.

Each procedure description starts at the System Prompt.

As you may recall, there are two ways to display the System Prompt, depending on whether or not an application has already been loaded into the memory of your terminal (see Table 4 below):

• If the message DOWNLOAD NEEDED is displayed, press [CLEAR] to enter System Mode.

• If an Application Prompt is displayed, press [FUNC/ENTER] and the [7] key simultaneously. Then, key in the System Password and press [FUNC/ENTER] again.

The default System Password, which is pre-set at the factory, is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1]

Each procedure takes you step-by-step through a complete System Mode operation in the following sequence:

1. When the System Prompt is displayed, select an operation by pressing the appropriate key,

2. Complete the operation, and

3. Return to the System Prompt.

Note: Before you proceed to enter System Mode and select the function(s) you want to perform, please verify that you have completely installed the Omni 3200, as described in Section 1 of this manual, and that the terminal is connected to a power source.

Procedure descriptions are arranged in a two-column, tabular format:

Display	Action

The left-hand column, with the heading Display indicates what appears on the terminal display at each step of the procedure. Please note the following conventions that are used in the Display column:

•   If a prompt or message appears on the screen exactly as it is described, it is shown in the Display column in the Ariel font, and in ALL CAPS. For example, DOWNLOAD NEEDED.

•   If text in the Display column is enclosed in parentheses, it means that the actual text or message may vary depending on the terminal version you have. For example, (Application Prompt). In this case, the normal font is used, and text is typed in Initial Caps.

Text presented in the Action column of a procedure description:

• Describes the current step and context of the procedure,

• Indicates the entries you must enter using the core keypad in response to a currently displayed prompt or message,

• Provides additional explanations or information about the steps of the particular System Mode function.

Note: Entering and leaving System Mode restarts the terminal application (assuming that an application has already been downloaded into the terminal's memory) and terminates any transaction that has not been completely processed.

Entering System Mode

To enter System Mode after you have connected the Omni 3200 terminal to a power source, follow the procedure described in Table 4.

Table 4   Enter System Mode

Display	Action
1. (Application Prompt) (or) DOWNLOAD NEEDED	If an Application Prompt is displayed, press [FUNC/ENTER] and [7] simultaneously to enter System Mode. If the system message DOWNLOAD NEEDED is displayed, press [CLEAR] to enter System Mode.
2. SYSTEM PASSWORD?	If an Application Prompt was displayed in Step 1 (that is, if an application has already been downloaded into the terminal memory), key in the System Password and press [FUNC/ENTER]. The default password, which is pre-set at the factory, is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1]. NOTE: Until an application has been downloaded into the terminal memory (that is, if the DOWNLOAD NEEDED message is displayed on your terminal), no password is required to enter System Mode.

Table 4   Enter System Mode

Display	Action
3. SYSTEM= (Firmware ID)	The System Prompt, which is displayed whenever the terminal enters System Mode, consists of SYSTEM=, followed by an 8-character firmware version ID, such as VPQ47AO0.
	You can now select from the following local and remote System Mode functions by pressing the appropriate key.
	NOTE: Each of these functions is described in detail below. Please read the corresponding procedure description before you initiate a specific System Mode operation.
	<u>**Key**</u> <u>**System Mode Function**</u>
	[1] Display EPROM information
	[2] Display Unit ID and SRAM size
	[3] Initiate display test
	[4] Initiate System Mode diagnostics
	[5] Set the date and time
	[6] Display messages and prompts
	[7] Edit a keyed file (CONFIG.SYS)
	[8] Initiate remote diagnostics
	[9] Test the thermal printer
	[0] Initiate a download by telephone
	[ALPHA] Change the System Password
	[BACKSPACE] Initiate destructive memory test
	[*] Upload software to another terminal
	[#] Receive direct software download
	[CLEAR] Exit and restart the application

[1]: Display EPROM Information

Pressing the [1] key in System Mode displays the following information about the flash EPROM in your Omni 3200 terminal:

•   Flash EPROM creation date (11/11/98, for example)

•   Initials of EPROM originator's name (DM, for example)

•   Four-digit TXO interpreter version number (5003, for example)

Note: If you contact your local VeriFone representative with questions or problems concerning your Omni 3200 terminal, you may be asked to supply this EPROM information.

Table 5   Display EPROM Information

Display	Action
1. SYSTEM= (Firmware ID)	Press [1] to display information about the terminal's flash EPROM.
2. (MM/DD/YY OO VVVV)	The date on which the Omni 3200 firmware was loaded into the EPROM, the initials of the person's name who performed the operation, and the version number of the interpreter used are displayed in the following format: MM/DD/YY OO VVVV, where MM = Month DD = Date YY = Year OO = Two-letter originator code (person's initials) VVVV = Four-digit interpreter version number To end the procedure and return to the System Prompt, press [CLEAR].

[2]: Display Unit ID and SRAM Size

In System Mode, press [2] once to display the terminal's 8-digit Unit ID. Then, to display the terminal's SRAM size, press [2] again t

The Unit ID is a permanent identifier that is assigned to each Omni 3200 terminal at the factory. Unique Unit IDs are only assigned at customer request. Otherwise, a generic ID (12000000) is used.

Because a terminal's Unit ID cannot be changed, it is often called a permanent terminal ID, or PTID. Factory-assigned PTIDs for VeriFone terminals are unique to ensure an added level of security.

Table 6   Display Unit ID and SRAM Size

Display	Action
1. SYSTEM= (Firmware ID)	Press [2] to display the terminal's Unit ID and SRAM size.

2. UNIT ID (MMXXXXXX)	The generic Unit ID for Omni 3200 terminals is '12000000' unless a permanent terminal ID (PTID) was set at the factory at customer request. The Unit ID format is
	
	MMXXXXXX, where
	
	    MM = Manufacturer ID (always '12' for VeriFone)
	    XXXXXX = Unique (or generic) unit ID number
	
	NOTE: If the 6-digit unit number consists of all zeros (XXXXXX = 000000), the terminal does not have a unique PTID.
	
	Next, to display the terminal's SRAM size, press [2] again.

3. (NNNN) KB RAM	The size of the SRAM (Static Random Access Memory) in your Omni 3200 terminal is displayed in kilobytes (KB). For example, 512 KB RAM. NOTE: The standard SRAM size of an Omni 3200 terminal is 512 KB. Optional SRAM sizes are 128 KB, 256 KB, and 1 MB (1000 KB). To end this procedure and return to the System Prompt, press [CLEAR].

[3]: Initiate Display Test

Press [3] in System Mode to initiate a two-step test of the terminal display panel. This test lets you verify that the pixel display grid and the display panel backlight are working properly.

Table 7   Initiate Display Test

Display	User Entry
1. SYSTEM= (Firmware ID)	Press [3] to initiate the display test.
2. (Pixel grid is 'on' and the backlight is 'on')	All of the pixels in the display grid are turned 'on' (dark) and the backlight remains 'on'. This lets you verify that the display grid is working properly. To continue the test, press [FUNC/ENTER].
3. (Pixel grid is 'off' and the backlight is 'off')	The display grid is 'off' and the backlight is 'off.' This test confirms that the backlight and pixel grid are working properly and can be turned off. To end the test and return to the SYSTEM= prompt, press [FUNC/ENTER] or [CLEAR].
4. SYSTEM= (Firmware ID)	The backlight is turned 'on' again and the System Prompt is displayed at the top of the pixel grid. To exit System Mode and restart the terminal application, press [CLEAR] again.

[4]: Initiate System Diagnostic Tests

Press [4] in System Mode to initiate a series of simple tests of the following integrated and optional system devices:

- Terminal keypad and display (integrated)

- Magnetic stripe card reader (integrated)

- Bar code reader (optional device)

- Modem connection to telephone line (Telco or Telset port)

Each diagnostic test must be performed manually, according to the procedure descriptions below. You can perform one or more tests selectively, and in any order. These four system diagnostic tests are described in Table 8 through Table 11 below.

Table 8   Test the Terminal Keypad and Display

Display	Action
1. SYSTEM= (Firmware ID)	Press [4] to initiate system diagnostic tests.
2. SYSTEM DIAG	To test the numeric keypad and display:
	In any order, press the keys [1] through [9] and [0] to test the keypad. The corresponding numbers should be displayed to the right of the SYSTEM DIAG prompt as you type them.
	NOTE: If a diagnostic test fails several times, contact your local VeriFone representative for assistance.
	To return to the SYSTEM= prompt, press [CLEAR].
	To exit System Mode and restart the terminal application, press [CLEAR] again.

Table 9   Test the Magnetic Stripe Card Reader

Display	Action
1. SYSTEM= (Firmware ID)	Press [4] to initiate system diagnostic tests.
2. SYSTEM DIAG	To test the integrated magnetic card reader:
	Place an encoded magnetic stripe card, with the stripe facing down and to the right, into the top of the card reader slot. Briskly slide the card downward through the slot without stopping.
3. T1=(X) T2=(X) T3=(X)	If data is read successfully from the card, a one-digit diagnostic code is displayed for each of three standard data tracks: T1= is for track 1, T2= is for track 2, and T3= is for track 3:
	0 = Data was read successfully 1 = No data was read 2 = No STX (Start of Text) 3 = No ETX (End of Text) 4 = Bad BCC (Block Control Character) 5 = Parity error
	If the card is not read at all, perhaps because the magnetic stripe was in the wrong position when the card was swiped, the 'T1= T2= T3=' message does not appear and the SYSTEM DIAG prompt continues to be displayed.
	NOTE: If a diagnostic test fails several times, contact your local VeriFone representative for assistance.
	To return to the SYSTEM= prompt, press [CLEAR].
	To exit System Mode and restart the terminal application, press [CLEAR] again.

Table 10   Test the Bar Code Reader

Display	Action
1. SYSTEM= (Firmware ID)	Press [4] to initiate system diagnostic tests.
2. SYSTEM DIAG	To test a bar code reader/wand:
	Swipe the tip of the wand in either direction across a bar code symbol.
	NOTE: The Omni 3200 firmware supports the Code 39 and EAN/UPC bar code optical recognition standards. Although seldom used, the 'raw timing' standard is also supported for bar code readers.
3. (NNN-NNN-NNN)	If the bar code is read successfully, the numeric value of the bar code is displayed. (This numeric value is usually imprinted above the vertical lines of the bar code, and includes hyphens.)
	If the bar code could not be read, the SYSTEM DIAG prompt continues to be displayed. In this case, repeat the procedure with another bar code.
	NOTE: If a diagnostic test fails several times, contact your local VeriFone representative for assistance.
	To return to the **SYSTEM=** prompt, press [CLEAR].
	To exit System Mode and restart the terminal application, press [CLEAR] again.

Table 11   Test the Telephone Line Connection

Display	Action
1. SYSTEM= (Firmware ID)	Press [4] to initiate system diagnostic tests.
2. SYSTEM DIAG	To test the telephone line (Telco or Telset) connection:
	Press the [ALPHA] key. A string of O's appears on the display. (In the default display font, a zero has a slash mark inside it to distinguish it from the letter O.)
	The string of O's indicates the following:
	– The Telco or Telset telephone line connection of the Omni 3200 terminal has been established, and
	– The dual-tone multiple-frequency (DTMF) function of the terminal modem has been automatically turned on.
3. OOOOOOOOOOOOOOOOO	To continue, press several numeric keys on the keypad to duplicate the actual dialing of a phone number.
	As you type, the numbers are appended to the string of O's. With each key press, you should hear the corresponding DTMF tone.
4. OOOOOOOOOOOOO1234...	When you have verified that the DTMF function works properly, press [FUNC/ENTER].
	A zero, preceded by an asterisk and followed by a comma (*0,), appears in the top right corner of the display and the DTMF function is turned off.
5. *0,	To complete the Telco test, press [BACKSPACE].
	The Telco function disconnects from the telephone line (that is, it "hangs up") and a string of ten asterisks, separated by commas, appears on the display.
6. ,*,*,*,*,*,*,*,*,*,*,	To return to the SYSTEM= prompt, press [CLEAR].
	To exit System Mode and restart the terminal application, press [CLEAR] again.
	NOTE: If a diagnostic test fails several times, contact your local VeriFone representative for assistance.

[5]: Set the Date and Time

This function lets you reset the current date and time maintained in the terminal's calendar/clock chip.

Following the procedure described in Table 12 below, you can change both values, or you can selectively change the date or time value.

Table 12   Set Date and Time

Display	Action
1. SYSTEM= (Firmware ID)	Press [5] to change the date and/or time.
	The prompt CHANGE DATE/TIME appears briefly, followed by the YYMMDD prompt.

2. CHANGE DATE/TIME
    (then)
    YYMMDD
	If you want to change the time, but not the date, press [FUNC/ENTER] or [CLEAR] now.

	To change the date:
	Key in today's date in YYMMDD (year, month, day) format. For example, to enter April 15, 1999, you would type [9] [9] [0] [4] [1] [5].
	NOTE: Depending on the country firmware version, the date format on your terminal may be different.
	If you make a mistake, press [BACKSPACE] to clear the incorrect character(s) and re-key the correct one(s).
	When the date entry is correct, press [FUNC/ENTER].
3. HHMMSS	If you do not want to change the time, press [FUNC/ENTER] or [CLEAR] now.
	To change the time:
	Type in the current time using the 24-hour format HHMMSS (hours, minutes, seconds). For example, to enter 8:30 a.m., key in [0] [8] [3] [0] [0] [0]. To enter 8:30 p.m., type [2] [0] [3] [0] [0] [0].
	When the new time entry is correct, press [FUNC/ENTER].

Table 12   Set Date and Time

Display	Action
4. Ww YYMMDD HHMMSS	The terminal displays the day of the week (Ww) followed by the date and time. (The current time is continuously updated by the calendar/clock chip.)
	NOTE: The days of the week are displayed with initial capital letters as Su, Mo, Tu, We, Th, Fr, and Sa.
	To return to the SYSTEM= prompt, press [CLEAR].
	To exit System Mode and restart the terminal application, press [CLEAR] again.

[6]: Display Messages and Prompts

If you press the [6] key in System Mode, all of the system prompts and error messages that are part of the current firmware version are displayed in sequence. When all messages have been displayed one time, the sequence ends and the System Prompt is re-displayed.

Note: This feature is for information only and is not a test function. To stop the display sequence at any time, press [BACKSPACE].

Table 13   Display Messages and Prompts

Display	User Entry
1. SYSTEM= (Firmware ID)	Press [6] to briefly display all system prompts and error messages in sequence.
	NOTE: Because over 50 system messages and prompts are stored in firmware, it takes several minutes for the complete display sequence to end. (Each message is displayed for approximately one second.)

Table 13   Display Messages and Prompts

Display	User Entry
2. (All system prompts and messages stored in firmware are displayed briefly, one at a time:) OPTIONS=01 MEMORY ERROR PROGRAM ERROR . . . OPTIONS=01	To stop the display sequence at any time, press [BACKSPACE]. NOTE: Depending on the country version of the firmware on your terminal, system prompts and messages may appear in a language other than English.
3. SYSTEM= (firmware ID)	When the sequence is completed, or if you press [BACKSPACE], the System Prompt is displayed. To exit System Mode and restart the terminal application, press [CLEAR].

[7]: Edit a Keyed File

Press [7] in System Mode to activate the keyed file editor. You can then use this editor to add or modify environment variables and application-specific variables that are stored as keyed records in the terminal's CONFIG.SYS file. For example, some of the keyed records commonly stored in CONFIG.SYS include:

*T=	Telephone number for remote diagnostics host computer
*ZA=	Application ID (for ZONTALK)
*ZP=	Host/download computer telephone number (for ZONTALK)
*ZT=	Terminal ID (for ZONTALK)

For more information about the ZONTALK 2000® download software, please contact your local VeriFone representative.

Note: To support application downloads using the VeriTalk[®] Enterprise System 1.3, called 'VeriTalk' in this manual, a different set of keyed variables must be stored in the CONFIG.SYS file. For more information about using VeriTalk in client-server installations, please contact your local VeriFone representative.

Using the keyed file editor, you can modify the value that follows a key by entering the appropriate value from the core keypad when the record is displayed. If no value is currently assigned to a keyed record, no data is displayed to the right of the equal sign (=).

During some System Mode procedures, the terminal firmware displays only the record key: *ZP= or *ZT=, for example. At this prompt, the keyed file editor is active and you can proceed to key in the correct variable for this key. When you key in the correct value, press [FUNC/ENTER] to store the variable under the corresponding key in the terminal's CONFIG.SYS file.

Note: Application-specific keys usually begin with a 3-digit number, followed by an equal sign (=), such as '101='. These keys are typically written into the CONFIG.SYS file during an application download. Subsequent downloads may add or modify these variables.

Table 14   Edit a Keyed File

Display	Action
1. SYSTEM= (Firmware ID)	Press [7] to activate the keyed file editor.
2. EDIT CONFIG.SYS (or) EDIT (Filename) (or) NO SUCH FILE	To edit records stored in CONFIG.SYS, press any key except [BACKSPACE] and continue with Step 3. If you press [BACKSPACE], the display prompt changes to EDIT. You then have two options: 1. Add or modify records in another existing keyed file, or 2. Create a new keyed file. If you choose the first option, type the name of an existing keyed file and press [FUNC/ENTER]. You can then continue with Step 5. If the requested file does not exist, the prompt NO SUCH FILE is displayed. To create a new keyed file, press [FUNC/ENTER] and continue with Step 3. NOTE: Press [CLEAR] at any point during Step 2 to return to the System Prompt (Step 1).
3. RECALL?	When you have entered the name of the file you want to edit or create, the RECALL? prompt asks you to: 1. Type in the record key of the variable you want to add or modify. For example, to display the download telephone number, key in *ZP and press [FUNC/ENTER]. or 2. Press [FUNC/ENTER] to display the first record in the existing keyed file you specified at the EDIT prompt (or to type the key and variable of the first record in the new keyed file you are creating). Press [FUNC/ENTER] to continue.

Table 14   Edit a Keyed File

Display	Action
4. (Key)= (EMPTY) (or) (Key)= (Variable)	NOTE: If a variable is not stored under a record key you enter in Step 5, the (EMPTY) message is displayed following the equal sign (=). **To enter a variable under an "empty" record key:** 1. Press [BACKSPACE], 2. Type in the variable data, and 3. Press [FUNC/ENTER] to store the new value. NOTE: If a variable does exist for a record key you enter, the value is always displayed following the equal sign (=). **To delete the variable data stored in a keyed record:** 1. Display the record 2. Press [BACKSPACE] and 3. Press [FUNC/ENTER]. **To edit a variable stored in a keyed record:** 1. Display the record, 2. Press [BACKSPACE] (or [ALPHA] to append data) 3. Key in the new (or appended) data, and 4. Press [FUNC/ENTER]. NOTE: In the procedure described above, you can press [ALPHA] after the [BACKSPACE] if you want to append data to the existing variable. In this way, you can avoid having to re-type the entire value. **To step through a keyed file, record by record:** 1. Starting at the RECALL? prompt, or at the record that is currently displayed, press FUNC/ENTER. 2. Press [FUNC/ENTER] to display the next record, and so on. 3. Press [ALPHA] to display the previous record. 4. The RECALL? prompt appears again when all of the records in the file have been displayed one time.

Table 14   Edit a Keyed File

Display	Action
5. RECALL?	When you are adding, deleting, or modifying variables, press [CLEAR] to return to the RECALL? prompt.
	NOTE: If you are editing a record, and if you press [CLEAR] before you press [FUNC/ENTER], the updated value is not saved.
	When the RECALL? prompt is displayed, press [CLEAR] to exit the keyed file editor and return to the System Prompt.
6. SYSTEM= (Firmware ID)	At the System Prompt, you can select another System Mode function, or press [CLEAR] again to exit System Mode and restart the terminal application.

The Keyed File Character Set

The keyed file character set consists of 95 ASCII characters from 00h to 5Fh (hexadecimal), or 0 to 95 (decimal). Characters outside this range should not be used and cannot be entered using the keyed file editor.

Note: For a complete list of the ASCII characters supported by the Omni 3200, as well as their decimal and hexadecimal equivalents, please refer to *Appendix B*.

[8]: Initiate Remote Diagnostics

Press [8] in System Mode to initiate a remote diagnostics session between the Omni 3200 terminal and a remote host computer over a telephone line.

Note: For detailed information about performing remote diagnostics, please refer to the section, "Performing Downloads."

[9]: Test the Thermal Printer

Press the [9] key in System Mode to initiate a test of the Omni 3200 integrated thermal printer. The test prints out all 95 ASCII characters in the printer's character set (32 to 126 decimal) in three different character sizes:

- Normal width / normal height (42 characters per line)

- Double width / normal height (21 characters per line)

- Double width / double height (21 characters per line)

The test ends automatically after about ten seconds by printing message Test Completed.

Note: Before you start this test, be sure that a roll of thermal paper is loaded in the integrated printer.

Table 15   Test the Thermal Printer

Display	User Entry
1. SYSTEM= (Firmware ID)	Be sure that a roll of thermal paper is loaded in the printer. Press [9] to start the integrated printer test.
2. INT. PRINT TEST	Three sets of 95 ASCII characters are printed out consecutively, each with a different character size. During the test, the INT. PRINT TEST message is displayed. The print test ends automatically after a few seconds and the System Prompt is displayed.
3. SYSTEM= (Firmware ID)	To exit System Mode, press [CLEAR].

[0]: Initiate Download By Telephone

Press [0] in System Mode to initiate a download of an application program from a remote download computer to the Omni 3200 terminal over a telephone line connection.

Note: For detailed information about performing downloads by telephone, as well as other types of downloads, please refer to the section, "Performing Downloads."

[ALPHA]: Change the System Password

Note: Some application program downloads automatically reset the System Password.

To change the System Password, press the [ALPHA] key while in System Mode.

If the Omni 3200 terminal you are working with is new, it may still use the factory pre-set default password, [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1].

If the default password does not work, there are two possible reasons why:

- The default System Password has been modified locally. Inquire about the password management procedures at your site. If you do not know the correct password, contact your local VeriFone representative for instructions.

- The System Password has been modified automatically as part of an application download procedure. Inquire about the password management procedures at your site.

> **Note:** The procedure described below assumes that the default System Password is still valid for your Omni 3200 terminal.

Table 16   Change the System Password

Display	Action
1. SYSTEM= (Firmware ID)	Press [ALPHA] to initiate the password change procedure.
2. CHANGE PASSWORD	The terminal displays the CHANGE PASSWORD prompt briefly and then asks you to key in the existing, or old, password.
3. OLD?	Key in the current System Password and press [FUNC/ENTER]. If you enter an invalid password, the OLD? prompt continues to be displayed until you: – Enter the correct password, or – Press [CLEAR] to cancel the operation. When the password is validated, you are then prompted to key in the new password. NOTE: A System Password is alphanumeric and must be 10 characters (or less) in length.
4. NEW?	Key in the new password and press [FUNC/ENTER].

5. AGAIN
 	
    (or)
 	
    NEW?
	The AGAIN prompt asks you to confirm the new password by entering it again. When you have done this, press [FUNC/ENTER].
	
	If you re-entered the password correctly, the modification takes effect immediately and the terminal returns to the System Prompt.
	
	If you key in the new password incorrectly, the NEW? prompt appears, asking you to repeat the entry one more time, or until it matches your the original entry. Repeat Steps 4 and 5.

Table 16   Change the System Password

Display	Action
6. SYSTEM= (Firmware ID)	The System Prompt is displayed when the password modification is complete. The next time you enter System Mode, you will have to enter the new System Password.
	You can now select another System Mode function or press [CLEAR] to exit System Mode and restart the terminal application.

[BACKSPACE]: Initiate Destructive Memory Test

In System Mode, press [0] to initiate a destructive test of the terminal's application memory (SRAM).

Caution: This function deletes all data and files currently stored in the terminal's application memory, including protected CONFIG.SYS records. Protected records have search keys that begin with an asterisk (*) or a pound sign (#), such as *ZA. Do not perform this procedure if you do not have a way to download a valid application program into the terminal's memory after the test is completed!

Table 17   Initiate Destructive Memory Test

Display	Action
1. SYSTEM= (Firmware ID)	Press [BACKSPACE] to initiate the destructive memory test.

2. MEMORY TEST
    MEM WILL BE LOST
    PRESS FUNC IF OK
	Three prompts are displayed to warn you that a destructive memory test has been initiated, and to inform you that the contents of the SRAM will be lost if you proceed with the test.

	Press [FUNC/ENTER] to proceed with the test.
	To end the memory test and return to the System Prompt prompt, press any key on the core keypad other than [FUNC/ENTER].

Table 17   Initiate Destructive Memory Test

Display	Action
3. MEMORY TEST (or) MEMORY -OK- (or) MEMORY ERROR	The memory test runs continuously until you stop the test (see below). During the test, the message displayed on the terminal screen alternates between MEMORY TEST and MEMORY -OK-. The message MEMORY -OK- indicates that no memory problems were detected during the previous test. NOTE: If a problem is detected during the test, the error message ***BAD RAM*** is displayed. If you see this message, contact your local VeriFone representative for assistance. To stop the test, press any key while the MEMORY -OK- message is displayed. The message MEMORY ERROR is then displayed to indicate that the contents of the memory were erased during the test. Press [CLEAR] to return to the System Prompt.
4. SYSTEM= (Firmware ID)	Because contents of the Omni 3200 application memory (SRAM) were cleared during the test, you can now proceed to select the appropriate System Mode function and download a new application program. NOTE: For more information about application downloads, please refer to the section "Performing Downloads."

[*]: Initiate Upload to Another Terminal

In System Mode, press [*] to upload the application program stored in the memory of one Omni 3200 terminal into the memory of another Omni 3200 terminal.

Note: The term "upload" is used to denote the transfer of data between two devices (terminals) of similar size, as opposed to a "download," which is the transfer of data from a larger device (host computer) to a smaller device (terminal).

The terminal that is uploading the application is called the 'sending terminal.' The other terminal is called the 'receiving terminal.'

To perform the data transfer, the sending terminal uses the [*] System Mode function (Initiate upload) and the receiving terminal uses the [#] function (Receive download).

Note: For detailed information and about performing terminal-to-terminal uploads, refer to the section, "Performing Downloads."

[#]: Receive Direct Download

In System Mode, press [#] to receive a direct software download from a download computer or from another Omni 3200 terminal.

A direct software download can be 'full' or 'partial.' In a direct download, as opposed to a download by telephone, the receiving Omni 3200 terminal must be connected to the download computer, or to another Omni 3200 terminal, by a cable. In addition, the download computer must be running the ZONTALK or VeriTalk application.

Note: For detailed information about receiving a direct download, please refer to the section, "Performing Downloads."

Performing Downloads

This section contains overview information and procedures for performing all available types of software and data transfers to support Omni 3200 terminal installations.

What is a Download?

In a 'download' procedure, data is transferred from one system to another. Usually, the system that sends the data is larger than the one that receives the data. If a smaller system transfers data to a larger system, or if the sending and receiving systems are of the same type or size, the transfer is called an 'upload'. In common usage, both types of data transfer procedures are often called 'downloads.'

To deploy and support the Omni 3200 terminal, two basic types of data transfer operations are used:

*   Data transfers (downloads) from a download computer, also called a host computer, to an Omni 3200 terminal, and

*   Data transfers (uploads) from one Omni 3200 terminal to another Omni 3200 terminal.

Note: When processing transactions, the Omni 3200 terminal also exchanges data in a packet-switching mode with a remote host computer.

What Can Be Downloaded?

You can use a download procedure to transfer the following types of software or data elements from one system to another:

- An Omni 3200 application program (a full program or, if a full application has already been downloaded, part of a program).

- Files, terminal configuration settings, passwords, current date and time, diagnostic information, and other binary data. (These things are usually downloaded along with the application program.)

- The TXO operating system (a newer or older version than the one that is stored in the terminal memory when it is shipped).

What Download Methods Are Available?

The following kinds of download methods are available to Omni 3200 application programmers, those responsible for deployment of terminals at end-user sites, and site administrators:

- <u>Direct download</u>. In a direct download, software or data is transferred from the sending system (a download computer) to the receiving system (an Omni 3200 terminal). A cable connects the serial ports of the two systems.

- <u>Download by telephone</u>. In a download by telephone — an 'indirect' as opposed to a 'direct' download — software or data is transferred over a telephone line from the sending system (a download computer) to the receiving system (an Omni 3200 terminal). The telephone line is connected to the modem of the sending computer and the receiving terminal.

- <u>Terminal-to-terminal upload</u>. In a terminal-to-terminal upload, software or data is transferred from the sending Omni 3200 terminal to the receiving Omni 3200 terminal. A cable connects the serial ports of the two terminals.

Which type of download method you should use select depends on several factors:

- The specific type of download task you wish to perform, including the type of software (application or operating system) you want to transfer.

- The location of the sending and receiving systems. That is, whether the systems are both local (in your immediate working environment) or whether one system is in a remote location (outside your immediate working environment).

- The availability of the required computer hardware and software, cables, or telephone line connections.

General Guidelines for Downloads

Here are some general guidelines to use when selecting the best download type to use:

- The direct download method is commonly used when developing and debugging terminal applications, and when preparing terminals for final deployment at end-user sites.

- Direct downloads are faster (up to 19200 bps using Direct Load over the download computer's COM1 port), and are more reliable than downloads by telephone.

- Downloads by telephone are most commonly use to deliver software updates from the host computer of a centralized deployment or service center to terminals that have already been deployed at end-user sites.

- To perform a direct download, the download computer must be running a special download program that is compatible with the Omni 3200 terminal's firmware. For example, ZONTALK, VeriTalk, or Direct Load (DL.exe).

- Direct application downloads may be full or partial, and do not replace the operating system on the receiving terminal. In addition, this type of download does not overwrite protected records stored in the terminal's CONFIG.SYS file.

- Terminal-to-terminal uploads overwrite all records, protected and non-protected.

- An operating system download overwrites both the existing operating system and the application program on the receiving terminal. You must therefore download an application program after you complete the operating system download.

Note: Additional information about the requirements and effects of different download procedures is provided below.

Comparison of Download Methods

The information provided in Table 18 below gives you a general overview of the hardware and software requirements, and the options and features (or effects) of each available download method.

Use this table to select the download method that is best suited to the task you need to perform. Then, go directly to the section for the corresponding 'Download Type' for a detailed how-to procedure description.

Table 18   Comparison of Download Methods

Download Type	Hardware Requirements	Software Requirements	Download Options and Features
Direct Application Download	Cable to connect download computer serial port to Omni 3200 'RS232' serial port	ZONTALK, VeriTalk, or Direct Load (DL.exe) running on download computer; Application program or program update resides on download computer; Correct variable data must exist in Omni 3200 CONFIG.SYS keyed file records	Can select full or partial application program transfer; Does not overwrite protected records (records starting with * or #.)
Direct Operating System Download	Cable to connect download computer serial port to Omni 3200 'RS232' serial port	ZONTALK, VeriTalk, or Direct Load (DL.exe) running on download computer; Operating system version resides on download computer; Configuration files must be set up on download computer Correct variable data must exist in Omni 3200 CONFIG.SYS keyed file records	Completely overwrites existing Omni 3200 operating system; Completely overwrites existing application program; Overwrites all settings on the receiving terminal, including CONFIG.SYS, date/time, and System Password, with those of the sending terminal; Requires that application download be performed afterwards; Upgrades (or downgrades) current TXO operating system version

Table 18   Comparison of Download Methods

Download Type	Hardware Requirements	Software Requirements	Download Options and Features
Application Download by Telephone	Modem and dial-up line connection on download computer side; Modem (integrated) and dial-up line connection on Omni 3200 using the Telco or Telset port	ZONTALK or VeriTalk running on download computer; Application program or program update resides on download computer; Correct variable data must exist in Omni 3200 CONFIG.SYS keyed file records	Can select full or partial application program transfer; Does not overwrite protected records (records starting with * or #.)
Operating System Download by Telephone	Modem and dial-up line connection on download computer side; Modem (integrated) and dial-up line connection on Omni 3200 using the Telco or Telset port	ZONTALK or VeriTalk running on download computer; Operating system version resides on download computer; Correct variable data must exist in Omni 3200 CONFIG.SYS keyed file records	Completely overwrites existing Omni 3200 operating system; Completely overwrites existing application program; Overwrites all settings on the receiving terminal, including CONFIG.SYS, date/time, and System Password, with those of the sending terminal; Requires that application download be performed afterwards; Upgrades (or downgrades) current TXO operating system version

Table 18   Comparison of Download Methods

Download Type	Hardware Requirements	Software Requirements	Download Options and Features
Terminal-to-Terminal Application Upload	Serial cable with RJ45-type connector on each end to connect RS232 ports of sending and receiving terminal; Receiving terminal must have same (or larger) SRAM size as the sending terminal	Sending and receiving terminal must have the same bootloader version; Correct and complete application program resides on the sending terminal	Performs full application transfer only; Overwrites all records stored in application memory, both protected and non-protected
Terminal-to-Terminal Operating System Upload	Serial cable with RJ45-type connector on each end to connect RS232 ports of sending and receiving terminal; Receiving terminal must have same (or larger) SRAM size as the sending terminal	Sending and receiving terminal should have the same (or similar) boot-loader version	Completely overwrites the existing Omni 3200 operating system; Completely overwrites an existing application program; Overwrites all settings on the receiving terminal, including CONFIG.SYS, date/time, and System Password, with those of the sending terminal; Requires that an application download be performed afterwards; Upgrades (or downgrades) the current TXO operating system version

Setting Up the Download Environment

The first step in performing a software download (or upload) is to establish that the software and hardware setup is correct for the sending and receiving system. Generally, this is the procedure you follow:

1. Identify and confirm the version of the software you wish to download, as well as the current version of the corresponding software, if any, on the receiving system.

2. Set up or confirm the download link (serial cable or dial-up telephone line) between the sending and receiving system. See instructions for connecting cables below.

3. Activate and configure the download software on the sending system (download computer), as required.

4. Initiate the download procedure on the receiving terminal, as described below, for the specific download type you have selected.

Cable Connection for Direct Downloads

To perform a direct download of an application program or operating system software, you must use a special cable to connect the serial ports of the sending system (download computer) and the receiving system (an Omni 3200 terminal). See Figure 17 below.

Two cables are available from VeriFone to support direct downloads: one for computers with DB25-type serial connectors (PN 26263-XX) and another for DB9-type connectors (PN 26264-XX). Both cables have a 10-pin RJ45-type modular plug on one end for the Omni 3200-side connection.

To connect the cable link between the sending download computer and the receiving Omni 3200 terminal:

1. Disconnect the power source from both systems.

2. Connect the DIN-type connector on one end of the cable to the COM1 (or COM2) serial I/O port on the download computer.

3. Connect the RJ45-type connector on the other end of the download cable to the 'RS232' port on the back panel of the Omni 3200 terminal.

4. Connect the power to the download computer and terminal.
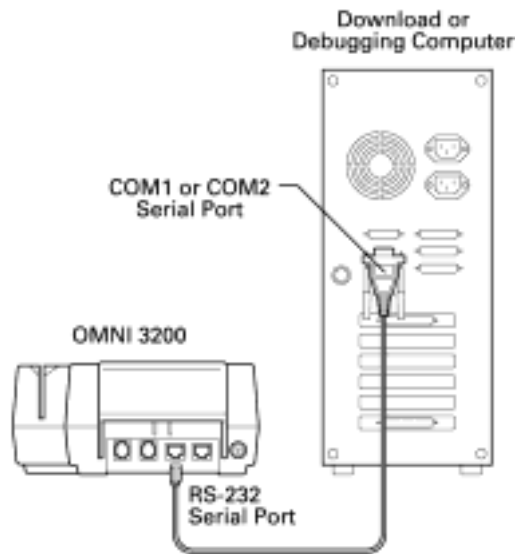
Figure 17 Direct Download Cable Connection

Cable Connection for Terminal-to-Terminal Uploads

To upload an application or an operating system version from one Omni 3200 terminal to another, you must use a serial cable to connect the 'RS232' ports of the sending and receiving terminal. See Figure 18 below.

The cable that is available for this purpose (VeriFone part number 05651-XX) has a 10-pin RJ45-type modular connector on each end. You insert the connector into the RS232 serial port on the back panel of each terminal.

To connect the sending and receiving Omni 3200 terminal for a terminal-to-terminal upload:

1. Disconnect the power source from both terminals.

2. Insert the RJ45-type modular connector on one end of the download cable into the 'RS232' port on the back panel of the sending terminal.

3. Insert the RJ45-type connector on the other end of the cable into the 'RS232' port on the back panel of the receiving terminal.

4. Connect the power source to both terminals.
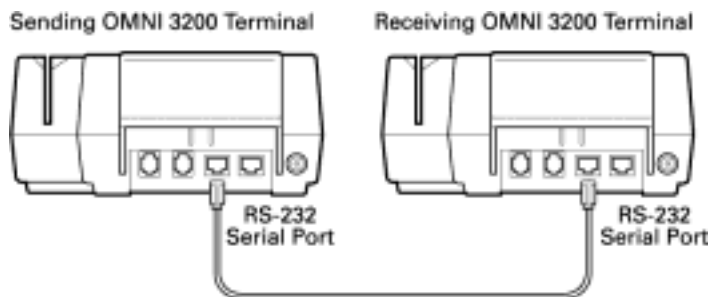
Figure 18 Terminal-to-Terminal Cable Connection

Application Downloads

This section contains step-by-step procedures for performing the following three types of application downloads:

- Direct (full or partial)

- Telephone (full or partial)

- Terminal-to-terminal (full only)

Note: Procedures for performing operating system downloads are presented in the section, "Performing Operating System Downloads" below.

Preparing for a Direct Application Download

Full or Partial?

The first step in performing a direct application download is to determine whether the download is to be full or partial:

- A <u>full download</u> transfers an entire application program to the receiving terminal, replacing any existing application with the new software.

- A <u>partial download</u> transfers only the part of an application program, or related data, that you specify in the computer's download control file. Usually, a partial download simply adds files and/or records to the terminal's CONFIG.SYS file.

Note: Separate procedure descriptions are provided below: one for a full application download and another for a partial application download.

What About Protected Records?

From Table 18, you may recall the following important points about direct downloads and protected records:

- A direct application download does not overwrite protected records stored on the receiving terminal. For example, the keyed records in the CONFIG.SYS file that start with * or #.

- A direct application download does not overwrite the receiving terminal's bootloader or operating system software.

There are two cases, however, in which an application download could accidentally overwrite an important file or record:

- If the file you are downloading has the same name as an existing file, the existing file will be overwritten.

- If a CONFIG.SYS record you are downloading has the same search key name as that of an existing keyed record, the variable value which corresponds to that key will be overwritten.

Note: To avoid accidental overwrites, be sure that the file names and record keys you plan to download are correct in relation to those that may be stored in the memory of the receiving terminal.

Checklist for a Direct Download Procedure

Before you begin a direct download procedure, check off these items:

- The download software (for ZONTALK, VeriTalk, or Direct Load) is running on the host computer, and is properly configured to download the correct application or data files to the Omni 3200 terminal.

- The serial cable between the download computer and the Omni 3200 terminal is properly connected.

- The receiving Omni 3200 terminal is connected to a power source.

Performing a Full Direct Application Download

The procedure described in Table 19 tells you how to perform a full direct application download from a host download computer to an Omni 3200 terminal.

Note: The steps described in the 'Action' column are performed directly on the Omni 3200 terminal. Notes are also provided in this column to indicate actions you must perform on the download computer side of the data transfer.

Table 19   Full Direct Application Download Procedure

Display	Action
1. SYSTEM= (Firmware ID)	Press [#] to initiate a direct application download.
	NOTE: When the UNIT RECEIVE prompt is displayed (next step), execute the appropriate ZONTALK, VeriTalk, or Direct Load command on the download computer to begin the download.
2. UNIT RECEIVE ---------- *--------- **-------- ***------- ****------ (. . .) **********	The UNIT RECEIVE prompt is displayed on the terminal until the download begins.
	The terminal displays the progress of the download. Each asterisk (*) displayed represents 10% of the application being transferred. When the display shows ten asterisks, the download is complete.
	NOTE: To stop the application download at any time, press [CLEAR]. The download procedure ends and the terminal returns to the System Prompt.

Table 19   Full Direct Application Download Procedure

Display	Action

3. DOWNLOAD DONE
   (or)
   DOWNLOAD DONE C
   (or)
   DOWNLOAD DONE P
   (or)
   DOWNLOAD DONE CP
 	
   (or)
   DOWNLOAD FAILED
	Any one of the following four messages indicates that the download was completed successfully:
	– DOWNLOAD DONE indicates that neither the clock nor the password was reset.
	– DOWNLOAD DONE C indicates the clock was set.
	– DOWNLOAD DONE P indicates the password changed.
	– DOWNLOAD DONE CP indicates both the clock and the password changed.
	
	When the full direct download is completed, you can press any key to return to the System Prompt.
	
	NOTE: If the message DOWNLOAD FAILED is displayed instead of one of the four DOWNLOAD DONE messages:
	
	1. Reset the download computer to repeat the download procedure.
	
	2. Press any key on the terminal to return to the System Prompt (SYSTEM=).
	
	3. Repeat the procedure, starting with Step 3. If the download fails again, check that the program you are attempting to download exists on the download computer, and that it is valid.
	
	If you continue to have problems with the direct application download procedure, contact your local VeriFone representative for assistance.

4. SYSTEM= (Firmware ID)	Press [CLEAR] at the System Prompt to exit System Mode and start the application program.

Performing a Partial Direct Application Download

The procedure described in Table 20 tells you how to perform a partial direct application download from a host download computer to an Omni 3200 terminal.

Note: The steps described in the 'Action' column are performed directly on the Omni 3200 terminal. Notes are also provided in this column to indicate the actions you must perform on the download computer.

Table 20   Partial Direct Application Download Procedure

Display	Action
1. SYSTEM= (Firmware ID)	Press [#] to initiate a direct application download.
2. UNIT RECEIVE	When the UNIT RECEIVE prompt is displayed, press [*] to indicate you want to receive a partial direct download.
	NOTE: When the PARTIAL DOWNLOAD prompt is displayed (next step), execute the appropriate ZONTALK, VeriTalk, or Direct Load command on the download computer to begin the download.
	To execute a VeriTalk download:
	1. Log in to the VeriTalk user interface.
	2. Bring up the Direct Download module.
	3. Select 'Operator Initiated'.
	4. Select download options.
	5. Click the Start button.
	NOTE: Detailed user documentation for VeriTalk is available from VeriFone. For more information about VeriTalk, please contact your local VeriFone representative.

Table 20   Partial Direct Application Download Procedure

Display	Action
3. PARTIAL DOWNLOAD ---------- *--------- **-------- ***------- ****------ (. . .) **********	The terminal displays the PARTIAL DOWNLOAD prompt until the download is initiated from the download computer. The terminal displays the progress of the download. Each asterisk (*) displayed represents 10% of the application being transferred. When the display shows ten asterisks, the download is complete. You can stop a download in progress at any time: – To stop a ZONTALK or Direct Load download at any time, press [CLEAR]. The download procedure ends and the terminal returns to the System Prompt. – To stop a VeriTalk download, click the Abort button on the Direct Download screen. (In VeriTalk, this is a privileged operation.)

Table 20   Partial Direct Application Download Procedure

Display	Action
4. DOWNLOAD DONE (or) DOWNLOAD DONE C (or) DOWNLOAD DONE P (or) DOWNLOAD DONE CP (or) DOWNLOAD FAILED	Any one of the following four messages indicates that the download was completed successfully: – DOWNLOAD DONE indicates that neither the clock nor the password was reset. – DOWNLOAD DONE C indicates the clock was set. – DOWNLOAD DONE P indicates the password changed. – DOWNLOAD DONE CP indicates both the clock and the password changed. When the partial direct download is completed, you can press any key to return to the System Prompt. NOTE: If the message DOWNLOAD FAILED is displayed instead of one of the four DOWNLOAD DONE messages: 1. Reset the download computer to repeat the download procedure. 2. Press any key on the terminal to return to the System Prompt (SYSTEM=). 3. Repeat the procedure, starting with Step 1. If the download fails again, check that the program you are attempting to download exists on the download computer, and that it is valid. If you continue to have problems with the direct application download procedure, contact your local VeriFone representative for assistance.
5. SYSTEM= (Firmware ID)	Press [CLEAR] at the System Prompt to exit System Mode and start the application program.

Performing an Application Download by Telephone

The procedure described in Table 21 below tells you how to perform a full or partial application download by telephone from a remote host download computer running ZONTALK software to an Omni 3200 terminal.

Note: For details about the setup requirements and download procedures for VeriTalk, please refer to the VeriTalk Enterprise System 1.3 User's Guide, VeriFone Part Number 52077-02.

Before you can initiate an application download by telephone, specific setup and configuration requirements must be met on both sides of the remote data transfer.

Preparing the Download Computer

For the remote download computer, these requirements are as follows:

- The download computer must be running the ZONTALK (or VeriTalk) download program,

- The ZONTALK (or VeriTalk) software must be correctly configured for the download by telephone,

- The application program (full or partial) that is to be downloaded must be resident in the download computer's file system,

- The download computer must have direct access to a dial-up telephone line over a modem connection, and

- The download computer must be ready to communicate over a telephone connection with the remote Omni 3200 terminal which initiates the download.

Preparing the Omni 3200 Terminal

To prepare the Omni 3200 terminal for a ZONTALK application download by telephone, the following requirements must be met:

- The internal modem of the Omni 3200 terminal must be connected to a dial-up telephone line using a direct (Telco) or pass-through (Telset) connection.

- The following keyed record variables are required by the ZONTALK download program, and should be stored in the terminal's CONFIG.SYS file:

Note: If the required ZONTALK variables (*ZP, *ZT, *ZA) are not stored in CONFIG.SYS when you initiate the application download, a prompt will appear on the terminal display asking you to enter each missing value.

- Complete dial-up telephone number of the remote download computer, including access numbers and prefixes (protected record key *ZP).

- Omni 3200 terminal ID (protected record key *ZT).

  This ZONTALK terminal ID is different than the permanent terminal ID (PTID) that is set at the factory. The *ZT variable is usually assigned prior to deployment of an Omni 3200 terminal to an end-user site, and can be modified in CONFIG.SYS using the keyed file editor. The terminal ID is a maximum 10-character alphanumeric value.

- Application program ID (protected record key *ZA).

  The application ID is usually assigned prior to deployment of an Omni 3200 terminal to an end-user site, and can be modified in CONFIG.SYS using the keyed file editor. The application ID is a maximum 21-character alphanumeric value.

Note: NOTE: If you do not know the correct values for *ZP, *ZT, and *ZA, contact your local VeriFone representative for information or instructions.

- If a baud rate other than 2400 bps is required for the application download by telephone, you can optionally assign a value to the *ZR record stored in CONFIG.SYS. Available baud rates are as follows:

Parameter	Baud Rate
No value	2400
*ZR= 0	300
*ZR= 2	1200
*ZR= 3	2400

Note: The following procedure description assumes that the ZONTALK setup and configuration requirements described above have been completed and confirmed to be correct on the download computer and on the Omni 3200 terminal.

Note: For details about the setup requirements and download procedures for VeriTalk, please refer to the VeriTalk Enterprise System 1.3 User's Guide, VeriFone Part Number 52077-02..

Starting the Download by Telephone Procedure

When you have set up the download computer and terminal, as describe above, you can start the download procedure, as described in Table 21 below.

Table 21   Application Download by Telephone (Using ZONTALK)

Display	Action
1. SYSTEM= (Firmware ID)	Press [0] to initiate a full or partial application download over a telephone line connection.
	NOTE: If the terminal's CONFIG.SYS file does not contain values for the *ZP, *ZT, and *ZA variables, you will be prompted to enter this information in the next step.
2. *ZP= (and/or) *ZT= (and/or) *ZA=	If one or more of the required ZONTALK variables are missing from the terminal's CONFIG.SYS file, you are now prompted to enter this information from the core keypad: • If *ZP=, key in the download computer's complete dial-up phone number and press [FUNC/ENTER]. • If *ZT=, key in the terminal ID and press [FUNC/ENTER]. • If *ZA=, key in the application ID of the program used by your terminal and press [FUNC/ENTER].
3. ZONTALK DOWNLOAD	When the terminal confirms that the required *ZP, *ZT, and *ZA variables are present in the CONFIG.SYS file, the message ZONTALK DOWNLOAD is displayed briefly to indicate this fact.
4. PARTIAL OR FULL? (alternating with) PART=* FULL=FUNC	The prompts PARTIAL OR FULL? and PART=* FULL=FUNC alternate on the terminal display, asking you to select the type of application download you want: partial or full: – To choose a partial download, press [*]. – To choose a full download, press [FUNC/ENTER]. The terminal then attempts to establish the dial-up telephone connection to the remote download computer.

Table 21   Application Download by Telephone (Using ZONTALK)

Display	Action
5. DIAL (Phone number) (or) NO LINE (or) NO DIALTONE (or) BUSY (or) NO ANSWER	The terminal's modem starts dialing the number stored in the *ZP record. Several different messages may be displayed at this point to indicate the status of the dial-up attempt: – NO LINE is displayed if no telephone line is plugged in to the Telco or Telset port. Check the terminal's modem port connection. – NO DIALTONE is displayed if the terminal could not get a dial tone on its dial-up line. Check the telephone line with a phone or another terminal. – BUSY is displayed if a busy signal is received when the number of the remote computer is dialed. Try again later. – NO ANSWER is displayed if the modem of the remote computer does not answer the call from the terminal. Check that the phone number stored in the *ZP record is correct. Try again later. NOTE: If the remote computer does not answer the terminal's call within 55 seconds (U.K), 30 seconds (U.S.) or 45 seconds (other countries), the terminal ends the dial-up session and the modem "hangs up."
6. CONNECTED ---------- *--------- **-------- ***------- ****------ (. . .) **********	When the telephone line connection between the Omni 3200 terminal and the remote download computer is established, the CONNECTED prompt is displayed and the download begins. The terminal displays the progress of the download. Each asterisk (*) displayed represents 10% of the application being transferred. When the display shows ten asterisks, the download is complete. NOTE: To stop the download at any time, press [CLEAR]. The download procedure ends and the terminal returns to the System Prompt.

Table 21   Application Download by Telephone (Using ZONTALK)

Display	Action
7. DOWNLOAD DONE (or) DOWNLOAD DONE C (or) DOWNLOAD DONE P (or) DOWNLOAD DONE CP (or) DOWNLOAD FAILED	Any one of the following four messages indicates that the download was completed successfully: – DOWNLOAD DONE indicates that neither the clock nor the password was reset. – DOWNLOAD DONE C indicates the clock was set. – DOWNLOAD DONE P indicates the password changed. – DOWNLOAD DONE CP indicates both the clock and the password changed. When the full or partial download is completed, you can press any key to return to the System Prompt. NOTE: If the message DOWNLOAD FAILED is displayed instead of one of the four DOWNLOAD DONE messages: 1. Press any key on the terminal to return to the System Prompt and repeat the procedure, starting with Step 1. 2. If attempts to download an application by telephone fail repeatedly, contact your local VeriFone representative for assistance.
8. SYSTEM= (Firmware ID)	Press [CLEAR] at the System Prompt to exit System Mode and start the application program.

Performing a Terminal-to-Terminal Application Upload

If you have one Omni 3200 terminal with a complete and up-to-date application program, you can conveniently transfer this application to one or more Omni 3200 terminals. The procedure is also fast, as the serial data transfer rate between the sending and receiving terminal is 19200 baud. The only hardware you need is a cable.

Note: A description of how to set up the cable connection between the sending and receiving terminal is described above in, "Cable Connection for Terminal-to-Terminal Uploads." See Figure 18.

The method of uploading an application from one terminal to another, as described in Table 22 below, is useful

• When a download computer is not available, and

• When you wish to perform a 'special' full application download, as described below.

'Special' Full Application Uploads

There is a major difference between the result of this method of transferring an application to another terminal and a full application download using other methods: Namely, it replaces all records — protected and non-protected — in the receiving terminal. It does not, however, replace the existing bootloader or operating system version.

You would, for example, use this method if you want to duplicate the current application software and settings of the sending terminal in one or more receiving terminals. This means that when the upload is completed, the receiving terminal has the same application program, as well as duplicate CONFIG.SYS settings, the identical date and time setting, and the same System Password.

The fact that a terminal-to-terminal upload overwrites all records stored on the receiving terminal has the following implications:

- You must make sure that application program, and all terminal settings on the sending terminal, such as the date and time, are the ones you wish to upload to the receiving terminal.

- When the terminal-to-terminal upload is completed, you must re-establish the receiving terminal's unique 'identity' by changing its terminal ID, its System Password, and any other settings or variables, as required for deployment.

Hardware and Software Requirements

Two mandatory conditions must be met before an application can be uploaded from one Omni 3200 terminal to another:

- The SRAM size of the receiving terminal must either be the same size, or larger than, the SRAM size of the sending terminal. For example, if the sending terminal has a 512 KB SRAM. The SRAM size of the receiving terminal must be either 512 KB or 1 MB.

  To determine the SRAM size of an Omni 3200, enter System Mode and press the [2] key twice.

- The firmware version ID of the sending and receiving terminals must be identical. For example, if the sending terminal has the Omni 3200 firmware version VPQ48AO0, the receiving terminal must also have version VPQ48AO0.

If one or both of these conditions are not met, an error message will be displayed when you attempt a terminal-to-terminal application upload.

Starting a Terminal-to-Terminal Upload Procedure

Before you start the procedure described in Table 22:

- Verify that the application software and all configuration settings on the sending terminal are those you wish to upload to the receiving terminal.

- Verify that the firmware version on both Omni 3200 terminals is identical and that the SRAM size of the receiving terminal is at least the same size as that of the sending terminal.

Note: The following procedure requires that you perform actions on both the sending and receiving terminal. For this reason, information in the Display and Action column is presented twice, and steps are numbered accordingly as 1a, 1b, 2a, 2b, and so on.

Caution: Any existing application, and all records stored on the receiving terminal, protected and non-protected, will be overwritten!

Table 22   Terminal-to-Terminal Application Upload

Display	Action
1a. Sending Terminal: SYSTEM= (Firmware ID)	Press [*] on the sending terminal to initiate the special full application upload.
1b. Receiving Terminal: SYSTEM= (Firmware ID)	Press [#] on the receiving terminal to receive the upload from the sending terminal.
2a. Sending terminal: UNIT SEND (then) FFFFFF (Memory block address)	The UNIT SEND prompt is displayed on the sending terminal until the upload begins. So that you can monitor the progress of the upload, a continuously updating 6-digit hexadecimal number is displayed and updated, indicating the address of the memory block currently being uploaded.

Table 22   Terminal-to-Terminal Application Upload

Display	Action
2a. Receiving terminal: UNIT RECEIVE (then) FFFFFF (Memory block address)	The UNIT RECEIVE prompt is displayed on the receiving terminal until the upload begins. The same continuously updating hexadecimal value is also displayed on the receiving terminal to indicate the address of the memory block current being received.
3a. Sending terminal: DOWNLOAD DONE CP (or) DOWNLOAD FAILED	When the upload is successfully completed, the DOWNLOAD DONE CP message is displayed on the sending terminal, indicating that the clock value (C) and the System Password (P) were modified on the receiving terminal. NOTE: If the message DOWNLOAD FAILED is displayed on either terminal, check the cable connection and try again. If the problem persists, contact your local VeriFone representative for assistance.
3b. Receiving terminal: DOWNLOAD DONE CP (or) DOWNLOAD FAILED	When the upload is successfully received, the DOWNLOAD DONE CP message is displayed on the receiving terminal, indicating that its clock value (C) and the System Password (P) were modified by the upload.
4a. Sending terminal: SYSTEM= (Firmware ID)	If the download is successful, the sending terminal automatically returns to the System Prompt. To exit System Mode, press [CLEAR].
4b. Receiving terminal: SYSTEM= (Firmware ID)	If the download is successful, press [CLEAR] on the receiving terminal to return to the System Prompt. Press [CLEAR] again to exit System Mode and start the application program.

Performing Multiple Uploads

When you have completed one upload, you can repeat the terminal-to-terminal application upload procedure described above for additional Omni 3200 terminals. To do this, follow these steps:

1. Disconnect the serial cable from the 'RS232' port of the terminal that received the previous application upload.

2. Connect the next Omni 3200 terminal to its power source and insert the plug of the serial cable into its 'RS232' port.

3. To set up the next upload procedure, ensure that both terminals are in System Mode, and that the System Prompt (SYSTEM=) is displayed. The sending terminal should already be in this condition (Steps 1a and 1b).

4. To start the next upload, press [#] on the receiving terminal. The rest of the procedure (Steps 2a through 4b) is the same.

Operating System Downloads

In addition to downloading application programs to Omni 3200 terminals, you can also download a new operating system without having to physically swap out any internal parts. This feature lets you easily update the terminal's TXO operating system when new releases become available.

You can perform an operating system download directly from a download computer, over a telephone line, or in a terminal-to-terminal upload.

Note: A ZONTALK operating system download can also be initiated by an application using the TXO library function *SVC_ZONTALK( )* with the 'O' (operating system) parameter.

The procedure for performing each type of operating system download operation is described below.

Note: See Table 18 to compare the general features of operating system downloads to different types of application system downloads.

An operating system download has the following effects on the receiving terminal:

- It overwrites the existing TXO operating system version, including the bootloader software that is stored in the flash EPROM. (There is no partial operating system download.)

- It erases the application program and all records, protected and non-protected, that are stored in the application memory

- It erases any unprocessed transactions.

For these reasons, be sure that all transactions on the receiving terminal have been completed before you initiate an operating system download. In addition, be prepared to download a new application program to the receiving terminal when you are finished with the operating system download.

Hardware and Software Requirements

The hardware requirements for operating system downloads are identical to those of corresponding application download methods:

- For direct downloads, a cable connection is required between the download computer and the receiving terminal.

- For downloads by telephone, the download computer and the receiving terminal must have a dial-up modem connection.

- For terminal-to-terminal uploads, a cable connection is required between the sending and receiving terminal. In addition, the SRAM size of the receiving terminal must be the same as, or larger than, the SRAM size of the sending terminal.

The software requirements for operating system downloads are very similar to those of application downloads:

- You can use Direct Load (DL.exe), ZONTALK, or VeriTalk to perform a direct operating system download.

- You can use ZONTALK or VeriTalk to perform an operating system download over a telephone line. To perform this type of download, ZONTALK and VeriTalk require that several keyed records be present in the receiving terminal's CONFIG.SYS file to define terminal and operating system parameters.

Note: The CONFIG.SYS records required by ZONTALK for an operating system download are described below. For details about the setup requirements and download procedures for VeriTalk, please refer to the VeriTalk Enterprise System 1.3 User's Guide, VeriFone Part Number 52077-02.

- For terminal-to-terminal uploads, there is no software requirement, except that the Omni 3200 firmware version on the sending and receiving terminal should be identical (or at least, very similar).

Upgrades and Downgrades

Depending on your specific requirements for terminal programming and deployment, you can download a later version of the TXO operating system than the current one (upgrade), or you can download a previous version (downgrade).

Note: Each operating system version has a name (*OS) and a serial number (*OT). Be sure to check and verify this information on both sides of the transfer before you initiate a download.

Performing a Direct Operating System Download

The procedure described in Table 23 below explains how to download a complete version of the TXO operating system from a download computer to an Omni 3200 terminal over a serial cable connection.

In Table 23, you will note that the first step of an operating system download procedure is different than for an application download.

Specifically, you must disconnect the power supply from the terminal, and then reconnect the power pin while holding down the [CLEAR] key. This causes the terminal to enter a special mode, indicated by a dual-tone beep, in which the bootloader software is running and the operating system is stopped.

To enter this terminal mode, in which only the bootloader is running, you must key in a System Password, regardless of whether or not an application has previously been downloaded into the terminal memory.

Note: An operating system download procedure overwrites the application program and all CONFIG.SYS records, protected and non-protected, on the receiving terminal. Please read the introductory information in this section carefully before you start!

Table 23   Direct Operating System Download

Display	Action

1. (Application Prompt)
 	
    (or)
 	
    DOWNLOAD NEEDED
	Disconnect the power supply from the terminal.
	
	Hold down the [CLEAR] key and reconnect the power supply to the terminal.

2. ENTER PASSWORD	When the terminal beeps, release the [CLEAR] key. The ENTER PASSWORD prompt is displayed. Key in the System Password and press [FUNC/ENTER]. NOTE: If the Omni 3200 you are preparing for the direct operating system download does not have an application program loaded in its memory (DOWNLOAD NEEDED), you must still key in the System Password to continue with this procedure. The default password, which is pre-set at the factory is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1].

3. DOWNLOAD Y=1 N=2
 	
    (then)
 	
    SYSTEM_MODE
    (If you press [2])
	To continue the download procedure, press [1]. Or, to stop the procedure, press [2].
	
	NOTE: If you press [2], you stop the download procedure and return to System Mode, as indicated by the SYSTEM_MODE message. At this point, you can press [1] to display the EPROM creation date (12/04/98 DM, for example) and the bootloader version ID (VPZ06LA1, for example).
	
	At this point, you can select another System Mode function or press [CLEAR] two times to exit the procedure and return to the Application Prompt (or to the DOWNLOAD NEEDED prompt if the terminal has no application).

Table 23   Direct Operating System Download

Display	Action
4. SYSTEM= (then) (Bootloader version ID) (then) OPSYS NEEDED ENTER * / 0 / # (then) ERASING FLASH	If you select the [1] option in Step 3, the terminal's bootloader firmware executes and you see the SYSTEM= message, followed by the bootloader version ID (for example, VPZ06AO0). After a few seconds, the OPSYS NEEDED prompt is displayed giving you three procedure options. To initiate the direct operating system download, press the [#] key. The ERASING FLASH message appears to indicate that the flash EPROM of the terminal is being erased as the first step of the operating system download procedure. NOTE: At this point, you cannot interrupt the download procedure from terminal and key presses will have no effect until the download is completed.
5. UNIT RECEIVE ---------- *--------- **-------- ***------- ****------ (. . .) **********	The terminal is now ready to receive the operating system download. The UNIT RECEIVE prompt continues to be displayed on the terminal until you execute the appropriate 'Start' command on the download computer. The terminal then displays the progress of the download. Each asterisk (*) displayed represents 10% of the operating system software being transferred. When the display shows ten asterisks, the download is complete.
6. DOWNLOAD DONE (or) DOWNLOAD FAILED	When the download is complete, the message DOWNLOAD DONE is displayed. The new operating system should then restart itself automatically and display the System Prompt. If you see the prompt DOWNLOAD FAILED, press [CLEAR], check all cable connections and repeat the procedure. NOTE: If you continue to have problems with the operating system download, contact your local VeriFone representative for assistance.

Table 23   Direct Operating System Download

Display	Action
8. SYSTEM= (Firmware ID)	At the end of a successful operating system download procedure, the System Prompt is displayed.
	NOTE: The firmware ID that follows SYSTEM= should now be that of the new operating system version you have just downloaded.
	While the terminal is still in System Mode, you can proceed to execute a direct application download.
	If, at the System Prompt, you press [CLEAR] and exit System Mode, the message DOWNLOAD NEEDED is displayed, indicating that you must download an application. (The operating system download erased any existing application software on the terminal.)

Performing an Operating System Download by Telephone

You can use the procedure described in Table 24 below to download an operating system over a telephone line connection between a remote download computer running the ZONTALK or VeriTalk software and an Omni 3200 terminal.

Before you can perform this type of download, you must set up ZONTALK or VeriTalk configuration files on the download computer and you must enter a set of ZONTALK or VeriTalk keyed records in the CONFIG.SYS file of the receiving terminal.

The download procedure must be initiated from the terminal, which dials up the download computer.

The required setup and configuration tasks are described below as they apply to ZONTALK. Some general guidelines are also included for using VeriTalk to perform an operating system download by telephone.

Setting Up the Download Computer (ZONTALK)

You must set up three files on the download computer before performing a ZONTALK operating system download by telephone: <terminal>.FAM, <terminal>.TMS, and <terminal>.TDD:

- <terminal>.FAM — The Family Type file for the download must contain an entry such as:

```
OMNI-OPSYS nn, X6
```

where 'nn' is a two-digit number identifying the family type in the ZONTALK log file. You can select any unique value.

- <terminal>.TMS — The TMS file must contain an entry such as:

```
OMNI*, * = internal 5
```

- <terminal>.TDD — The Terminal Data Directory file for the download must contain an entry such as:

```
OMNI-OPSYS Appl_ID Filespec
```

where 'Appl_ID' is the operating system name, and 'Filespec' is the (path\) filename that ZONTALK will use to locate the Terminal Data Records.

You can use a modem download file, <Appl_ID>.DLD, to define the operating system binary file that is sent to the requesting terminal. This way, the terminal does not have to "know" the new operating system name prior to requesting an operating system download. The .DLD download file may contain such entries as:

```
[KEY]   [keyvalue1]   4      Opsys1.bin
[KEY]   [keyvalue2]   4      Opsys2.bin
```

where 'KEY' (keyword) and 'keyvalue', when set appropriately in the ZONTALK Terminal Data Records, let you selectively download different operating system binary files according to their corresponding KEY values.

Setting Up the Terminal (ZONTALK)

To prepare the receiving terminal for an operating system download by telephone, you must store variable data under the following required record keys in the terminal's CONFIG.SYS file:

- *OS = Name of operating system to download

- *OT = Serial number of operating system to download

- *OD = Device (COM port) for ZONTALK to use (1–4)

- *OP = ZONTALK host telephone number

- *OR = Baud rate code
  (0=300, 1=600, 2=1200, 3=2400, 4=4800, 5=9600, 6=19,200)

Appending an Application Download to the Procedure

If you intend to execute an application download by telephone immediately following the operating system download, be sure to set the appropriate parameters in the CONFIG.SYS file.

For ZONTALK, the relevant parameters are as follows:

- *ZD=   The modem port to use for the application download (DEV_MODEM).

- *ZP=   ZONTALK host telephone number

- *ZT=   ZONTALK terminal ID

- *ZR=   ZONTALK baud rate

- *ZA=   ZONTALK application ID

Setting Up the Download Computer (VeriTalk)

To set up the download computer to perform a VeriTalk operating system download by telephone, follow these general guidelines:

1. Set up the Family and Application configuration on the download computer using the VeriTalk user interface.

2. Invoke the Family configuration and check if the Omni 3200 is listed. If not, enter this device and fill in the respective fields.

3. Invoke the Application configuration and add the name of the application (or in this case, the operating system) you want to download to the corresponding Family selection (Omni 3200).

4. Switch to the Download Info tab on the Configuration screen and specify the files to be downloaded for that application. (This step is equivalent to defining the ZONTALK <terminal>.TDD file.) For selective file downloads, you can also specify a KEY value.

5. Switch to the Parameter Info tab on the Configuration screen and specify the details of the memory locations, such as valid ranges, allowed characters, and so on. (This step is equivalent to defining the ZONTALK <terminal>.TDF file.)

6. Invoke the Relation Editor and add Terminal(s) for the download. After you add a terminal, specify (configure) the parameters to be downloaded for that terminal. You can also use the KEY directive to select specific files for download.

Note: You can import existing .DLD and/or .TDF files into VeriTalk using the Import utility from the VeriTalk user interface. You can also import files that contain useful configuration and parameter data.

Note: For details about the setup requirements and download procedures for VeriTalk, please refer to the VeriTalk Enterprise System 1.3 User's Guide, VeriFone Part Number 52077-02.

> **Note:** The procedure for operating system downloads by telephone, as described in Table 24 below, prompts you to enter missing CONFIG.SYS records. If you have previous entered this information, the prompts do not appear, and the operation proceeds to the next step in the procedure.

When you have completed all of the preliminary steps described above, you can start the procedure.

Table 24   Operating System Download by Telephone

Display	Action
1. (Application Prompt) (or) DOWNLOAD NEEDED	Disconnect the power supply from the terminal. Hold down the [CLEAR] key and reconnect the power supply to the terminal.
2. ENTER PASSWORD	When the terminal beeps, release the [CLEAR] key. The ENTER PASSWORD prompt is displayed. Key in the System Password and press [FUNC/ENTER]. NOTE: If the Omni 3200 you are preparing for the operating system download by telephone does not have an application program loaded in its memory (DOWNLOAD NEEDED), you must still key in the System Password to continue with this procedure. The default password, which is pre-set at the factory is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1].
3. DOWNLOAD Y=1 N=2 (then) SYSTEM_MODE (If you press [2])	To continue the download procedure from the receiving terminal, press [1]. Or, to stop the procedure, press [2]. NOTE: If you press [2], you stop the download procedure and return to System Mode, as indicated by the SYSTEM_MODE message. At this point, you can press [1] to display the EPROM creation date (12/04/98 DM, for example) and the bootloader version ID (VPZ06LA1, for example). At this point, you can select another System Mode function or press [CLEAR] two times to exit the procedure and return to the Application Prompt (or to the DOWNLOAD NEEDED prompt if the terminal has no application).

Table 24   Operating System Download by Telephone

Display	Action
4. SYSTEM= (then) (Bootloader version ID) (then) OPSYS NEEDED ENTER * / 0 / #	If you select the [1] option in Step 3, the terminal's bootloader firmware executes and you see the SYSTEM= message, followed by the bootloader's version ID (for example, VPZ06AO0). After a few seconds, the OPSYS NEEDED prompt is displayed giving you three procedure options. To initiate the direct operating system download, press the [0] key. NOTE: At this point, any key entry other than those prompted by the procedure is 'INVALID' until the download operation is completed. (To stop the procedure, you can disconnect the power from the terminal and start over again at Step 1.)
5. OPSYS NEEDED ENTER * / 0 / #	At the OPSYS NEEDED prompt, press [0] to select the operating system download by telephone option.
6. OPSYS NAME	This message is displayed if the name of the operating system to be downloaded has not been entered in the CONFIG.SYS file. For ZONTALK, the key for this record is *OS. Key in the name of the operating system and press [FUNC/ENTER].
7. OPSYS ID	This message is displayed if the ID (serial number) of the operating system to be downloaded has not been entered in the CONFIG.SYS file. For ZONTALK, the key for this record is *OT. Key in the serial number of the operating system and press [FUNC/ENTER].

Table 24   Operating System Download by Telephone

Display	Action
8. 1–SERL 2–MODEM	This message is displayed to let you select a serial port or a modem port for the download.
	To perform an Omni 3200 download by telephone, press [2] to select the internal modem, DEV_MODEM, as the terminal's COM port for the data transfer.
	NOTE: It is also possible to use the 'RS232' serial port (sync/async) to perform a direct operating system download. To select this option, press [1]. If you select the serial option, the message ERASING FLASH is displayed, followed by the message UNIT RECEIVE. The terminal then waits for the serial data transfer to be initiated from the download computer. To use this option, a serial cable connection between the download computer and the terminal is required.
9. BAUD RATE 0/2/3	This prompt is displayed when you select [2] in Step 8, and if the baud rate selection has not been entered in the CONFIG.SYS file. For ZONTALK, the key for this record is *OR. The default baud rate is *OR=3, or 2400 baud. (The '0' value is for 300 baud and the '2' value is for 1200 baud.)
	Select [3] and press [FUNC/ENTER].
10.TELEPHONE NUMBER	This prompt is displayed if the telephone number of the download computer has not been entered in the terminal's CONFIG.SYS file. For ZONTALK, the key for this record is *OP.
	Key in the complete dial-up telephone number for the download computer. Do not use hyphens or other special characters in the number. Press [FUNC/ENTER] to store the value in CONFIG.SYS and to continue.
11.MODEM INIT STRG	This prompt is displayed if the modem initialization string has not been entered in the CONFIG.SYS file. The key for this record is *MI. If required, enter the initialization string and press [FUNC/ENTER] to store the value in CONFIG.SYS.

Table 24   Operating System Download by Telephone

Display	Action
12.ERASING FLASH	When you select [2] in Step 8, and when the necessary values have been stored in CONFIG.SYS (Steps 9–11), the ERASING FLASH message appears briefly to indicate that the flash EPROM of the terminal is being erased as the first step of the operating system download. NOTE: At this point, you cannot interrupt the download procedure from terminal and key presses will have no effect until the download is completed.
13.DIAL (Phone number) (or) NO LINE (or) NO DIALTONE (or) BUSY (or) NO ANSWER	The terminal's modem starts dialing the number stored in the *OP record (for ZONTALK). Several different messages may be displayed at this point to indicate the status of the dial-up attempt: – **NO LINE** is displayed if no telephone line is plugged in to the Telco or Telset port. Check the terminal's modem port connection. – NO DIALTONE is displayed if the terminal could not get a dial tone on its dial-up line. Check the telephone line with a phone or another terminal. – BUSY is displayed if a busy signal is received when the number of the remote computer is dialed. Try again later. – **NO ANSWER** is displayed if the modem of the remote computer does not answer the call from the terminal. Check that the phone number stored in the *OP record is correct. Try again later. NOTE: If the remote computer does not answer the terminal's call within 55 seconds (U.K), 30 seconds (U.S.) or 45 seconds (other countries), the terminal ends the dial-up session and the modem "hangs up." If the dial-up connection cannot established, you can press [CLEAR] to return to the prompt in Step 5, and try again.

Table 24   Operating System Download by Telephone

Display	Action
14.CONNECTED ---------- *--------- **-------- ***------- ****------ (. . .) **********	When the telephone line connection between the Omni 3200 terminal and the remote download computer is established, the CONNECTED prompt is displayed and the operating system download begins. The terminal displays the progress of the download. Each asterisk (*) displayed represents 10% of the application being transferred. When the display shows ten asterisks, the download is complete.
15.DOWNLOAD DONE (or) DOWNLOAD FAILED	When the download is complete, the message DOWNLOAD DONE is displayed. The new operating system should then restart itself automatically and display the System Prompt. If you see the prompt DOWNLOAD FAILED, press [CLEAR], check all cable connections and repeat the procedure. NOTE: If you continue to have problems with the download, contact your local VeriFone representative for assistance.
16.SYSTEM= (Firmware ID)	At the end of a successful operating system download procedure, the System Prompt is displayed. NOTE: The firmware ID that follows SYSTEM= should now be that of the new version you have just downloaded. While the terminal is still in System Mode, you can proceed to execute a direct application download. If, at the System Prompt, you press [CLEAR] and exit System Mode, the message DOWNLOAD NEEDED is displayed, indicating that you must download an application.

Performing a Terminal-to-Terminal Operating System Upload

The procedure described in Table 25 below tells you how to transfer a complete TXO operating system version from one Omni 3200 terminal to another.

To perform this upload, the sending and receiving terminals are connected at their respective RS232 ports by a serial cable, as described at the beginning of this section.

For terminal-to-terminal operating system uploads, the sending and receiving terminal to not necessarily have to have the same bootloader version and SRAM size, although this is recommended.

Note: The following procedure requires that you perform actions on both the sending and receiving terminal. For this reason, information in the 'Display' and 'Action' columns is presented twice, and steps are numbered accordingly as 1a, 1b, 2a, 2b, and so on.

Table 25   Terminal-to-Terminal Operating System Upload

Display	Action
1a. Sending Terminal: (Application Prompt) (or) DOWNLOAD NEEDED	Disconnect the power supply from the terminal. Press and hold down the [CLEAR] key and reconnect the power supply to the power port on the terminal's back panel.
1b. Receiving Terminal: (Application Prompt) (or) DOWNLOAD NEEDED	Disconnect the power supply from the terminal. Press and hold down the [CLEAR] key and reconnect the power supply to the power port on the terminal's back panel.
2a. Sending Terminal: ENTER PASSWORD	When the terminal beeps, release the [CLEAR] key. The ENTER PASSWORD prompt is displayed. Key in the System Password.

Table 25   Terminal-to-Terminal Operating System Upload

Display	Action
2b. Receiving Terminal: ENTER PASSWORD	When the terminal beeps, release the [CLEAR] key. The ENTER PASSWORD prompt is displayed. Key in the System Password.
3a. Sending Terminal: DOWNLOAD Y=1 N=2 (then) SYSTEM_MODE (If you press [2])	Press [1] to prepare the sending terminal to upload the operating system, or [2] to stop the procedure. To continue the upload procedure, press [1]. NOTE: If you press [2], you stop the download procedure and return to System Mode, as indicated by the SYSTEM_MODE message. At this point, you can press [1] to display the EPROM creation date (12/04/98 DM, for example) and the bootloader version ID (VPZ06LA1, for example). At this point, you can select another System Mode function or press [CLEAR] two times to exit the procedure and return to the Application Prompt (or the DOWNLOAD NEEDED prompt).
3b. Receiving Terminal: DOWNLOAD Y=1 N=2 (then) SYSTEM_MODE (If you press [2])	Press [1] to prepare the receiving terminal to download the operating system, or [2] to stop the procedure. To continue the download procedure, press [1]. NOTE: If you press [2], you stop the download procedure and return to System Mode, as indicated by the SYSTEM_MODE message. At this point, you can press [1] to display the EPROM creation date (12/04/98 DM, for example) and the bootloader version ID (VPZ06LA1, for example). At this point, you can select another System Mode function or press [CLEAR] two times to exit the procedure and return to the Application Prompt (or the DOWNLOAD NEEDED prompt).

Table 25   Terminal-to-Terminal Operating System Upload

Display	Action
4a. Sending Terminal: SYSTEM= (then) (Bootloader version ID) (then) OPSYS NEEDED ENTER * / 0 / #	If you select the [1] option in Step 3a, the terminal's bootloader firmware executes and you see the SYSTEM= message, followed by the bootloader version ID (for example, VPZ06AO0). After a few seconds, the OPSYS NEEDED prompt is displayed giving you three procedure options. To prepare the sending terminal for a terminal-to-terminal operating system upload, press [*].
4b. Receiving Terminal: SYSTEM= (then) (Bootloader version ID) (then) OPSYS NEEDED ENTER * / 0 / # (then) ERASING FLASH	If you select the [1] option in Step 3b, the terminal's bootloader firmware executes and you see the SYSTEM= message, followed by the bootloader's version ID (for example, VPZ06AO0). After a few seconds, the OPSYS NEEDED prompt is displayed giving you three procedure options. To initiate the terminal-to-terminal operating system download from the receiving terminal, press [#]. The ERASING FLASH message appears to indicate that the flash EPROM of the receiving terminal is being erased as the first step of the operating system download procedure. NOTE: At this point, you cannot interrupt the download procedure. Key presses will have no effect until the download is completed.
5a. Sending terminal: UNIT SEND (then) FFFFFF (Memory block address)	When the upload starts, the UNIT SEND prompt appears on the sending terminal. So that you can monitor the progress of the upload, a continuously updating 6-digit hexadecimal number is displayed and updated, indicating the address of the memory block currently being uploaded.
5b. Receiving terminal: (then) FFFFFF (Memory block address)	When the download starts, the UNIT RECEIVE prompt appears on the receiving terminal. The same continuously updating hexadecimal value is also displayed on the receiving terminal to indicate the address of the memory block current being received.

Table 25   Terminal-to-Terminal Operating System Upload

Display	Action
6a. Sending terminal: DOWNLOAD DONE (or) DOWNLOAD FAILED	When the upload is complete, the message DOWNLOAD DONE is displayed and the sending terminal returns automatically to the System Prompt. If you see the prompt DOWNLOAD FAILED, press [CLEAR], check all cable connections and repeat the procedure. NOTE: If you continue to have problems with the operating system download, contact your local VeriFone representative for assistance.
6b. Receiving terminal: DOWNLOAD DONE (or) DOWNLOAD FAILED	When the download is complete, the message DOWNLOAD DONE is displayed. The new operating system on the receiving terminal starts executing automatically and the System Prompt is displayed. If you see the prompt DOWNLOAD FAILED, press [CLEAR], check all cable connections and repeat the procedure.
7a. Sending terminal: SYSTEM= (Firmware ID)	At the end of a successful operating terminal-to-terminal operating system download, the System Prompt is displayed. While the sending terminal is still in System Mode, you can proceed to execute a direct application download.
7b. Receiving terminal: SYSTEM= (Firmware ID)	At the end of a successful terminal-to-terminal operating system download, the System Prompt is displayed. NOTE: The Omni 3200 firmware version ID (the 8-character value in VPQXXYYZ format) that is displayed as part of the System Prompt on the receiving terminal should now be identical to the firmware ID of the sending terminal. At at the System Prompt, press [CLEAR] to exit System Mode.
8. Receiving terminal: DOWNLOAD NEEDED	When you exit System Mode on the receiving terminal, the message DOWNLOAD NEEDED is displayed, indicating that you must now download an application. (The operating system upload erased the existing application software.)

Remote Diagnostics and Debugging

Included in the *TXO Workbench Kit* (VeriFone part number P006-211-04) are programs and documentation to support Omni 3200 remote diagnostics and the debugging of applications written for the Omni 3200.

Because the features and functions of remote diagnostics and debugging are so closely related, they are described together in this section. Both tasks require an external diagnostic computer that can send commands to the terminal and receive and evaluate data that the terminal sends back.

Remote diagnostics are different than the self-diagnostic tests you can perform on an Omni 3200 in System Mode. Specifically, when you enter System Mode and press [4] to test the display, keypad, integrated printer, and so on. These are local diagnostics, as opposed to remote diagnostics.

The debugging program that is included in the *TXO Workbench Kit* is called AX.exe. This section is a general introduction to the features and functions of the AX.exe program.

Note: For more detailed information about how to use AX.exe, please refer to the *TXO Workbench User's Guide* (VeriFone part number 11468).

Performing Remote Diagnostics

Using remote diagnostics, a technician or programmer working from a diagnostic computer can exchange information with an Omni 3200 terminal. This exchange can be direct, using a serial cable connection, or it can be done over a telephone line using a modem.

The Omni 3200 terminal's remote diagnostics capabilities permit the use of highly automated test procedures with a minimum of user intervention at the terminal.

The only task required on the terminal side of the diagnostics session is to enter System Mode and initiate a simple procedure. The procedure for conducting a remote diagnostics session varies slightly, depending on whether remote diagnostics are to be performed remotely over a telephone line connection or on-site using a direct cable connection.

Diagnostic Commands

The diagnostic computer can send the following commands to the terminal. These same commands are also used by the terminal's debugging feature. Detailed descriptions and formats of these commands are provided at the end of this section.

Command	Description
C	Clear all diagnostic counters
D	Memory dump
F	Get current source file name
G	Get diagnostic counters
N	Direct download via current debugger port
P	Read from device
W	Write to device
X	Terminate diagnostics and restart terminal

Performing Remote Diagnostics Over a Telephone Line

You initiate remote diagnostics from the terminal. To do this, you must first enter System Mode, and then press the [8] key. The terminal dials the diagnostic computer and connects to the diagnostic function. At this point, the diagnostic computer assumes control of the session.

The computer sends commands to the terminal and the terminal responds by sending data which the remote computer then interprets. This data consists of statistical counts of a wide range of terminal operations.

When the remote diagnostic session is completed, the following events occur:

1. The host computer ends the telephone connection,

2. The remote diagnostic procedure running on the Omni 3200 terminal ends, and

3. The terminal exits System Mode and the application is restarted.

Setting Up the Diagnostic Computer

To perform remote diagnostics of an Omni 3200 terminal, the following requirements must be met on the diagnostic computer:

•   It must be running the Omni 3200 diagnostics program.

•   It must be ready to receive a telephone request via modem from the Omni 3200 terminal.

Setting Up the Terminal

Before you can perform a remote diagnostics session over a telephone line connection, the following requirements must be met:

- The Omni 3200 terminal must be connected to a dial-up telephone line.

- The remote diagnostic computer must be set up and ready to receive a telephone request from the Omni 3200 terminal.

- The telephone number of the remote diagnostic computer number must be stored in a keyed record in the terminal's CONFIG.SYS file under the record key, *T.

Note: If the *T record is not present in the CONFIG.SYS file when you start remote diagnostics, you will be prompted to enter the telephone number during the procedure.

- To select a specific baud rate for the diagnostics session, you can include a *RDR record in the CONFIG.SYS file of the terminal to be diagnosed. The *RDR record is optional. If the remote computer does not detect the *RDR record when it dials up the terminal, it uses the default value of 2400 baud (*RDR= 3). Possible values for *RDR include the following:

  00 = 300
  01 = 600
  02 = 1200
  03 = 2400
  04 = 4800
  05 = 9600
  06 = 19200

Note: Because *RDR is an optional value, you will not be prompted to enter this keyed record during the diagnostics procedure described in Table 26 below.

Initiating a Remote Diagnostics Session

The procedure described in Table 26 below explains how to initiate a remote diagnostics session from an Omni 3200 terminal over a telephone line connection. As in previous procedure descriptions, it starts from the System Prompt (displayed when the terminal is in System Mode).

Table 26 Remote Diagnostics Over a Telephone Line

Display	Action
1. SYSTEM= (Firmware ID)	To initiate a remote diagnostics session, press [8].
2. REMOTE DIAG (or) *T=	The message REMOTE DIAG is displayed briefly. If no telephone number is stored in the *T= record, the *T= prompt appears asking you to enter this number into the CONFIG.SYS file. To do this, you simply key in the value from the core keypad and press [FUNC/ENTER]. If the telephone number of the remote diagnostic computer has already been stored in the CONFIG.SYS file, the terminal automatically starts the dial-up procedure.

Table 26   Remote Diagnostics Over a Telephone Line

Display	Action
3. REMOTE DIAG DIAL (Dialing proceeds) (then) REMOTE DIAG DIAL 18004559000 (or) NO LINE (or) NO DIALTONE (or) BUSY (or) NO ANSWER	The terminal modem starts dialing the remote computer. Each digit of the telephone number appears to the right of the DIAL prompt as it is dialed. Several different messages may be displayed at this point to indicate the status of the dial-up attempt: – NO LINE is displayed if no telephone line is plugged in to the Telco or Telset port. Check the terminal's modem port connection. – NO DIALTONE is displayed if the terminal could not get a dial tone on its dial-up line. Check the telephone line with a phone or another terminal. – BUSY is displayed if a busy signal is received when the number of the remote computer is dialed. Try again later. – NO ANSWER is displayed if the modem of the remote computer does not answer the call from the terminal. Check that the phone number stored in the *OP record is correct. Try again later. NOTE: If the remote computer does not answer the terminal's call within 55 seconds (U.K), 30 seconds (U.S.) or 45 seconds (other countries), the terminal ends the dial-up session and the modem "hangs up." If the dial-up connection cannot established, you can press [CLEAR] to return to the prompt in Step 1, and try again. When the dial-up telephone connection is established, the remote computer takes control of the diagnostic session. No further input is required from the Omni 3200 side of the remote connection.
4. (Application Prompt)	When the diagnostic session is completed, the remote computer "hangs up" and the application starts automatically. The Application Prompt is displayed and the terminal is ready to process transactions.

Remote Diagnostics Using a Direct Cable Connection

Developers of Omni 3200 applications and diagnostic test programs can perform remote diagnostics on-site using a direct cable connection. This method is much faster than telephone diagnostics, with a data transfer rate up to 19200 baud.

The hardware and software environment required for direct diagnostics is very similar when performing diagnostic tests and when debugging applications:

- The diagnostic computer must be running a diagnostics test program or a debugging program

- The terminal must have a variable stored in its CONFIG.SYS file under the search key, *D. (For more information about the *D variable, see below.)

- The diagnostic computer and the terminal must be connected by a serial cable.

The *D Variable in CONFIG.SYS

Before you can perform direct remote diagnostics or debugging, you must enter variable data in the terminal's CONFIG.SYS file under the search key, *D. This variable determines the terminal port and baud rate to be used for diagnostics.

To enter the *D variable in CONFIG.SYS, you must enter System Mode, activate the keyed file editor by pressing the [7] key, and type in the record key and variable. If you do this, and then exit System Mode, the terminal restarts and automatically enters Direct Diagnostic Mode.

Note: In Direct Diagnostic Mode, the terminal surrenders control to the remote diagnostic or debugging computer. This means that when the *D variable is set, the terminal application cannot run. To run the application, you must remove the *D variable from the terminal's CONFIG.SYS file, so that *D=(empty).

The format of the *D variable is as follows:

```
*D=ppbb,
```

where

'`pp`' is the terminal serial port and

'`bb`' is the baud rate code,

as defined in the Setting column below:

<u>Variable</u>	<u>Setting</u>
`pp`	Diagnostics port number (in hex) 0A = 'RS232' port (COM1) 1C = 'Bar code/PIN pad' port
`bb`	Baud rate code 00 = 300 01 = 600 02 = 1200 03 = 2400 04 = 4800 05 = 9600 06 = 19200

Note: A commonly used setting is *D=0A06 (or, RS232 port at 19200 baud). The preferred serial port for this procedure is 'RS232'.

Connecting the Cable for Direct Diagnostics

To perform direct terminal diagnostics or debugging, you must use a serial cable to connect the serial ports of the diagnostic or debugging computer to the Omni 3200 terminal.

Two cables are available from VeriFone to support direct diagnostics and debugging: one for computers with DB25-type serial connectors (PN 26263-XX) and another for DB9-type connectors (PN 26264-XX).

To connect the cable between the computer and the Omni 3200 terminal:

1. Disconnect the power source from both systems.

2. Connect the DIN-type connector on one end of the cable to the COM1 (or COM2) serial I/O port on the download computer.

3. Connect the RJ45-type connector on the other end of the download cable to the 'RS232' port on the back panel of the Omni 3200 terminal.

4. Connect the power to the download computer and terminal.
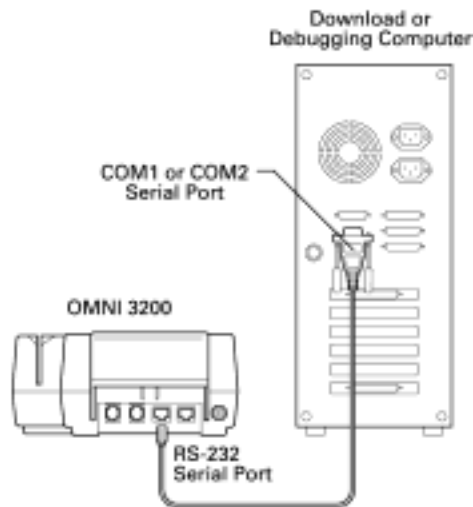
Figure 19 Cable Connection for Direct Remote Diagnostics and Application Debugging

Initiating a Direct Diagnostics Session

The procedure described in Table 27 below describes how to set up the required *D record in an Omni 3200 terminal's CONFIG.SYS file and to initiate a direct remote diagnostics or debugging session from the terminal. The procedure assumes that the required software program is running on the diagnostic or debugging computer, and that the serial cable connection has been established as described above.

Note: When you exit System Mode, control of the terminal is surrendered to the diagnostic or debugging computer. The terminal application cannot execute until you manually remove the *D record.

Table 27 Remote Diagnostics Using a Direct Cable Connection

Display	Action
1. SYSTEM= (Firmware ID)	Press [7] to select the keyed file editor.
2. EDIT CONFIG.SYS	Press [FUNC/ENTER] to enter the *D record in the CONFIG.SYS file.
3. RECALL?	Enter [*] [3] [ALPHA] and press [FUNC/ENTER] to view the current variable stored under the *D search key.
4. *D= (empty)	The terminal displays the *D= key as (empty). Press [BACKSPACE] to erase the (empty) prompt. To select the terminal's RS232 port (COM1) at 19200 baud, type [0] [2] [ALPHA] [0] [6] [FUNC/ENTER].
5. *D= 0A06	Press [CLEAR] to store the *D variable you entered. NOTE: The *D value of '0A06' is an example only, and is not a required value.
6. RECALL?	Press [CLEAR] again to exit the keyed file editor.
7. SYSTEM= (Firmware ID)	Press [CLEAR]. The terminal restarts and begins its communication session with the diagnostic computer. During this time, the System Prompt is displayed. NOTE: Once started, the diagnostic session cannot be stopped from the terminal side. When the session ends, the host computer returns control to the terminal and the application restarts automatically.

Debugging an Application Program

In Direct Diagnostic Mode, a program developer can use debugging software running on a diagnostic computer to monitor an application program running on the Omni 3200 terminal, as well as test and validate the program code. Debugging via modem is not supported.

The AX.exe debugger software, which is included in the *TXO Workbench, Version 4.1*, includes a set of debugging commands that provides extensive remote control of the terminal. The debugger software links the program command line running on the terminal to source code stored on the diagnostic computer's disk drive.

Setting Up the Terminal for a Debugging Session

Before using the Omni terminal's debugging support feature, your system must meet the following requirements:

- An application must already have been downloaded to the terminal.

- The debugging computer must be connected by a VeriFone serial cable to the terminal's 'RS232' port.

- The host computer must run debugging software (such as AX.exe) that is compatible with the Omni 3200 terminal.

- The terminal's CONFIG.SYS file must contain a variable stored under the *D record key, as described above in the section on remote diagnostics.

Initiating a Debugging Session From the Terminal

The procedure for initiating a remote debugging session from an Omni 3200 terminal is identical to the procedure for initiating a remote diagnostics session, as described in Table 27 above.

When the *D environment variable has been stored on the terminal, you can select the Debug menu item you want to execute from the AX.exe Project submenu.

Debugging Commands

The debugging computer can send the following commands to the terminal. These commands are described in detail at the end of this section.

Command	**Terminal Response**
B	Get static registers
C	Clear all diagnostic counters
D	Memory dump
F	Get current source file name
G	Get diagnostic counters
I	Get current EM instructions
L	Get line number in the current source file
N	Direct download via current debugger port
P	Read from device
R	Resume EM execution
S	Block EM execution
T	Configure diagnostic parameters
W	Write to device
X	Terminate diagnostics and restart terminal
[space]	Single step through program

Data Packet Exchange

Remote diagnostics and debugging commands, as well as the terminal's responses, are exchanged as data packets. A data packet has the following format:

<FFh> <55h> <count> <command> <data> <CRC1> <CRC2>

where,

- CRC stands for Cyclic Redundancy Check,

- <FFh> <55h> is the packet header that appears at the beginning of every command or response packet, and

- <count> is the number of bytes that follow the command or response packet. This lets the terminal know how long the packet will be. The count includes the following:

Bytes	Item Counted
1	Count
1	Command
(variable)	Number of bytes = length of data in bytes
1	1st CRC character
1	2nd CRC character

- <command> is a one-byte character identifying the command.

- The <data> portion of the packet contains the variable information, if any, related to the diagnostic command.

- The two CRC characters (<CRC1> <CRC2>) represent the standard CRC16 accumulation for the foregoing packet; they are used for error detection.

Error Detection Protocols

If the terminal receives a packet with the wrong CRC, it sends a packet containing the NAK (negative acknowledgment) back to the diagnostic computer. This indicates to the diagnostic computer that it has to re-send the packet to the terminal.

The diagnostic computer can also send an identical NAK packet to the terminal. This tells the terminal to re-send the last packet and can be used by the diagnostic computer whenever the terminal sends back a packet containing the incorrect CRC.

The format for the NAK data packet is:

<FFh> <55h> <count> <NAK> <CRC1> <CRC2>

Diagnostic Counters

The terminal firmware maintains internal counters to assist with the remote diagnostic evaluation of the terminal operations. Counters 0 through 19 are reserved for monitoring the application program.

Diagnostic counters, listed in Table 28 below, enable the diagnostic program running on the host computer to count the number of times that various events occur on the terminal during a diagnostic or debugging session.

Note: Diagnostic counters noted with an asterisk (*), 50–68, are not supported for the Omni 3200 terminal.

Table 28   Diagnostic Counters

Counter	Description of Event
0 – 19	(Used by application program)
20	Key presses
21	Power on cycles or system restarts
22	Exits from System Mode using the [CLEAR] key
23	ZONTALK 2000 downloads attempted
24	Direct connect uploads attempted
25	Direct connect downloads attempted
26	Normal beeps
27	Error beeps
28	Bar code reads attempted
29	Bar code reads with errors
30	Card reads attempted
31	Card reads with errors
32	Internal modem messages indicating OK
33	Internal modem messages indicating CONNECT (at 300 baud)
34	Internal modem messages indicating RING DETECT

Table 28   Diagnostic Counters

Counter	Description of Event
35	Internal modem messages indicating NO CARRIER
36	Internal modem messages indicating ERROR
37	Internal modem messages indicating CONNECT 1200
38	Internal modem messages indicating NO DIALTONE
39	Internal modem messages indicating BUSY
40	Internal modem messages indicating CONNECT 2400
41	Internal modem messages indicating NO LINE
42	MDM host packet ACK'd by terminal (protocol level)
43	MDM host packet NAK'd by terminal (protocol level)
44	ACKs received on modem port (protocol level)
45	NAKs received on modem port (protocol level)
46	ACKS sent on COM1 port
47	NAKS send on COM1 port
48	ACKS received on COM1 port
49	NAKS received on COM1 port
50 *	ACKS sent on COM2 port
51 *	NAKS sent on COM2 port
52 *	ACKS received on COM2 port
53 *	NAKS received on COM2 port
54 *	ACKS sent on COM3 port
55 *	NAKS sent on COM3 port
56 *	ACKS received on COM3 port
57 *	NAKS received on COM3 port
58 *	Hayes modem messages DONE DIAL
59 *	ACKS sent on LAN port
60 *	NAKS sent on LAN port
61 *	ACKS received on LAN port
62 *	NAKS received on LAN port

Table 28   Diagnostic Counters

Counter	Description of Event
63 *	Transmit timeouts on LAN port
64 *	Runt packages received on LAN
65–68 *	Reserved for future use

Descriptions of Diagnostic and Debugging Commands

The commands for remote diagnostics and debugging are listed in alphabetical order below. These commands must be executed at the remote diagnostics or debugging computer and cannot be initiated from the terminal.

Note: Several commands can only be used for debugging. These commands are noted in the respective command heading as for (Debugger Only).

B — Get Static Registers (Debugger Only)

The B command asks the terminal to send the contents of the PB, EB, HB, and ML static registers. The terminal sends the contents of each register back to the diagnostic computer. The requested registers are each two bytes in binary, with the least significant byte first.

Command Packet Received by Terminal:

   <FFh> <55h> <count> B <CRC1> <CRC2>

Response Packet Sent by Terminal:

   <FFh> <55h> <count> B <PB> <EB> <HB> <ML> <CRC1> <CRC2>

C — Clear All Diagnostic Counters

The C command clears all of the diagnostic counters in the terminal. The terminal sends the response packet to the diagnostic computer to indicate that the command was received and executed.

Command Packet Received by Terminal:

        `<FFh> <55h> <count> C <CRC1> <CRC2>`

Response Packet Sent by Terminal:

        `<FFh> <55h> <count> C <CRC1> <CRC2>`

D — Memory Dump

The D command asks the terminal to send the contents of its memory relative to the register specified. The terminal will send back the data as specified in the command's parameter. The D parameter has the following format:

        `rsaaaaaann`

where,

    `r =` Register to use for the memory location base. See below.

r Value	Register
0	Absolute memory reference
1	PB
2	EB
3	HB
4	ML
5	PC
6	HP
7	SP
8	LB

s	=	Minus sign (–) for negative offset or plus sign (+) for positive offset
aaaaaa	=	Unassigned memory location offset
nn	=	Number of bytes to get (in hexadecimal format)

Command Packet Received by Terminal:

                                                                           <FFh> <55h> <count> D <rsaaaaaann parameter> <CRC1> <CRC2>

Response Packet Sent by Terminal:

    <FFh> <55h> <count> D <ASCII data of the size requested> <CRC1> <CRC2>

F — Get Current Source File Name

The F command asks the terminal to send the name of the application's current source file. The debugging computer can use this information to refer to the source file stored in the computer's disk drive.

Command Packet Received by Terminal:

    <FFh> <55h> <count> F <CRC1> <CRC2>

Response Packet Sent by Terminal:

    <FFh> <55h> <count> F <filename> <CRC1> <CRC2>

G — Get Diagnostics Counters

The G command reads 16 diagnostics counters beginning at the counter number specified. The 16 counts returned are each two bytes, in binary format.

Command Packet Received by Terminal:

<FFh> <55h> <count> G <counter number> <CRC1> <CRC2>

Response Packet Sent by Terminal:

<FFh> <55h> <count> G <16 counts> <CRC1> <CRC2>

I — Get Current EM Instructions (Debugger Only)

The I command asks the terminal to send the EM code currently being executed back to the computer.

Command Packet Received by Terminal:

<FFh> <55h> <count> I <CRC1> <CRC2>

Response Packet Sent by Terminal:

<FFh> <55h> <count> I <data> <status> <CRC1> <CRC2>

Where

<data> is binary and consists of 4 words of EM base registers (PC, HP, SP, LB) and 6 bytes of EM opcodes to be executed, and

<status> is the status byte configured in the 'T' command.

L — Get Line Number in the Current Source File (Debugger Only)

The L command asks the terminal to indicate the source code line number that the program is currently running. The debugging computer can use this line number to locate and display the source code for that line stored in the computer's disk drive.

The line number is sent as a two-byte binary value with the least significant byte first.

Command Packet Received by Terminal:

   <FFh> <55h> <count> L <CRC1> <CRC2>

Response Packet Sent by Terminal:

   <FFh> <55h> <count> L <line number> <status> <CRC1> <CRC2>

Where <status> is the status byte configured in the "T" command.

N — Direct Download Via Current Debugger Port

The N command sets up the terminal for a unit-receive direct download through the current debugger port.

After the terminal has responded with the response packet (as shown below), the terminal displays the message UNIT RECEIVE, and is ready for a direct download through the debugger port.

Then the serially attached computer may use ZONTALK 2000 protocol or the TXO Direct Load program (DL.exe) for the direct download. When the download ends, the terminal restarts automatically and begins running the new application program.

Command Packet Received by Terminal:

           \<FFh\> \<55h\> \<count\> N \<CRC1\> \<CRC2\>

Response Packet Sent by Terminal:

           \<FFh\> \<55h\> \<count\> N \<CRC1\> \<CRC2\>

P — Read from Device

The P command reads data from the device specified in the device parameter.

The \<device\> parameter is a one-byte value identifying the device to read from. Use the device codes found in the table below.

The terminal sends the device code back to the computer including the data it receives from the device. The \<data\> returned is a counted string. Device codes and descriptions are listed below.

Device Code	Name	Description
00	STDIN	16-key console keypad
02	STDOUT	16-character console display panel
06	CLOCK	Real-time clock/calendar
10	COM1	External RS-232 asynchronous communications link (RS232 port)
12	COM2	Integrated thermal printer
16	MODEM	Internal modem
24	CARD	Magnetic card reader
26	BAR	Bar code reader (Bar code/PIN pad port
28	PINPAD	PIN entry device (Bar code/PIN pad port)

Command Packet Received by Terminal:

                <FFh> <55h> <count> P <device> <CRC1> <CRC2>

Response Packet Sent by Terminal:

                <FFh> <55h> <count> P <device> <data> <CRC1> <CRC2>

R — Resume EM Execution (Debugger Only)

The R command resumes executing the EM code that was blocked by the S command or put in the step mode by the [space] command. The terminal sends the response packet to the diagnostic computer to indicate that the command was received and executed.

Refer to the descriptions of the S and [space] commands following.

Command Packet Received by Terminal:

                <FFh> <55h> <count> R <CRC1> <CRC2>

Response Packet Sent by Terminal:

                <FFh> <55h> <count> R <CRC1> <CRC2>

S — Block EM Execution (Debugger Only)

The S command makes the terminal stop executing EM code, essentially pausing the application program. The terminal sends the response packet to the diagnostic computer to indicate that the command was received and executed.

To resume executing the program, send an R command to the terminal.

Command Packet Received by Terminal:

<FFh> <55h> <count> S <CRC1> <CRC2>

Response Packet Sent by Terminal:

<FFh> <55h> <count> S <CRC1> <CRC2>

T — Configure Diagnostics Parameters (Debugger Only)

The T command sets the diagnostics status byte, which is also reported as part of the L and I command response packet.

<u>Bit</u>	<u>Input/Output</u>	<u>Setting Description</u>	
Bit 0	Output	1 =	If the source file name has changed because the previous F command was issued
		0 =	Otherwise.
Bit 7	Input	1 =	Set stepping on EM instructions
		0 =	Set stepping on source lines.

Command Packet Received by Terminal:

<FFh> <55h> <count> T <status byte> <CRC1> <CRC2>

Response Packet Sent by Terminal:

<FFh> <55h> <count> T <CRC1> <CRC2>

W — Write to Device

The W command writes data to the device specified in the command packet:

- The <device> parameter consists of a two-byte code identifying the device to write to. Codes for the various devices available are listed below.

- The <data> parameter consists of the data to send to the device. It is a counted string.

The terminal sends a response packet to the diagnostic computer to indicate that the command was received and executed.

Device Code	Name	Description
00	STDIN	16-key console keypad
02	STDOUT	16-character console display panel
06	CLOCK	Real-time clock/calendar
10	COM1	External RS-232 asynchronous communications link (RS232 port)
12	COM2	Integrated thermal printer
16	MODEM	Internal modem
24	CARD	Magnetic card reader
26	BAR	Bar code reader (Bar code/PIN pad port
28	PINPAD	PIN entry device (Bar code/PIN pad port)

Command Packet Received by Terminal:

   <FFh> <55h> <count> W <device> <data> <CRC1> <CRC2>

Response Packet Sent by Terminal:

   <FFh> <55h> <count> W <CRC1> <CRC2>

X — Terminate Diagnostics and Restart Terminal

The X command stops executing the application program and restarts the terminal. If the terminal is running remote diagnostics in the System Mode, the command will make the terminal exit the System Mode and restart itself.

This command is typically used for disconnecting the phone line link with the remote computer.

The terminal sends the response packet to the diagnostic computer to indicate that it has received the command.

Command Packet Received by Terminal:

      <FFh> <55h> <count> X <CRC1> <CRC2>

Response Packet Sent by Terminal:

      <FFh> <55h> <count> X <CRC1> <CRC2>

[space] — Single Step through Program (Debugger Only)

This command stops the execution of the application and single-steps either a line of the source code or an EM instruction, depending on bit 7 used in the configuration 'T' command. The terminal also sends a response packet. The execution can be resumed at any time with the resume 'R' command.

Command Packet Received by Terminal:

      <FFh> <55h> <count> <space character> <CRC1> <CRC2>

Response Packet Sent by Terminal:

      <FFh> <55h> <count> <space character> <CRC1> <CRC2>

Troubleshooting and Service

VeriFone follows stringent quality control standards in the manufacture of Omni 3200 terminals. Each unit that leaves the factory receives numerous tests to ensure quality and reliable operation. However, should you encounter a problem in operation, read this section for possible causes and solutions.

System Messages

Appendix A lists all of the system messages, including informational and error messages, and prompts, that may appear on the Omni 3200 display panel. For an explanation of a message indicating that some terminal malfunction has occurred, please refer to the descriptions in Appendix A.

Using Remote Diagnostics to Identify Problems

Problems with a specific Omni 3200 terminal can be identified by a computer running a diagnostic test program. The diagnostic computer can be connected directly to the terminal by a cable, or the diagnostics session can take place over a telephone line connection. Remote diagnostics are described in the section, "Remote Diagnostics and Debugging."

Troubleshooting Guidelines

The troubleshooting guidelines provided below identify various problems and suggest appropriate corrective action(s). If you have problems operating your Omni 3200 terminal, please read through these troubleshooting examples. If a problem persists, or if it is not described below, contact your local VeriFone representative for assistance.

Troubleshooting Scenarios

During normal, day-to-day operation of your Omni 3200 terminal, it is possible that minor malfunctions may occur. Here are some examples of possible problems, and steps you can take to resolve them.

Terminal Display Does Not Show Correct or Readable Information

1. Check all cable connections and verify that the telephone line is properly connected.

2. Check the electrical outlet. The power pack connectors may be loose or the outlet may not be supplying power.

3. Replace the power pack that came with your terminal with a power pack from another Omni 3200 terminal. If this solves the problem, contact your local VeriFone representative. You may need to order a replacement power pack.

4. Perform a local diagnostic test of the terminal display in System Mode. (See Table 7 and Table 8 in the section "Performing System Mode Operations.")

5. If the problem persists, contact your local VeriFone representative for assistance.

Telephone Line Connection Does Not Work Properly

1. Check the telephone line cord and all telephone connections.

2. If you are using a pass-through (Telset) connection, check the line using another telephone base unit. If the other telephone works, have the defective telephone repaired or replaced.

3. If you are using a direct (Telco) connection, check the telephone line using another Omni 3200 terminal. If the telephone connection does not work, contact your local telephone company to check the status of the line.

4. Perform a local diagnostic test of the telephone connection in System Mode. (See Table 11 in the section "Performing System Mode Operations.")

5. If the problem persists, contact your local VeriFone representative for assistance.

Printer Does Not Work

1. Check all terminal power connections. The printer receives its power directly from the Omni 3200 terminal. The LED indicator light in the upper left corner of the terminal should be on.

2. If the LED indicator is blinking off and on, the printer is out of paper. Remove the paper roll cover and install a new roll of printer paper.

3. Perform a test of the integrated thermal printer by pressing the [9] key in System Mode. (See Table 15 in the section, "Performing System Mode Operations.")

4. If the problem persists, contact your local VeriFone representative for assistance.

Printer Paper is Jammed in the Feed Mechanism

1. Remove the paper roll cover. Then, lift up on the small lever located on right side of the paper roll cradle until it snaps into its 'up' position. This lets you move the paper freely through the paper feed mechanism.

2. Carefully cut the damaged paper from the paper roll and manually clear the remaining paper from the feed mechanism.

3. Lower the paper release lever until it snaps back into its default ('down') position.

4. Re-install the roll of printer paper that was removed in Step 3, or install a new roll.

5. If the problem with paper jams persists, try using a higher-quality type of thermal printer paper.

PINpad Does Not Work

1. Check all PINpad cable connections and try again.

2. If the problem persists, contact your local VeriFone representative for assistance.

Serial Port Does Not Work

1. The two serial ports on the back panel of the terminal are identified by the 'RS232' and 'Bar Code/PINpad' icons. Check that the device connected to the serial port has power and that it is functioning correctly.

2. The cable connecting the optional device to the Omni 3200 serial port may be defective. Try using a different serial cable.

3. If the problem persists, contact your local VeriFone representative for assistance.

Terminal Does Not Process Transactions

The cause of the problem may be the magnetic card reader:

1. Perform a test transaction using several different magnetic stripe cards to ensure the problem is not a defective card.

2. Make sure you are swiping cards properly. With the Omni 3200 card reader, the black, magnetic stripe on the card should face downward and to the right.

The problem you are experiencing might also be caused by a terminal hardware or software malfunction:

1. Process a transaction manually using the keypad instead of the card reader.

2. If the manual transaction works, contact your local VeriFone representative for assistance. The card reader may be defective.

A problem with the telephone line may also be causing the problem with transaction processing:

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1. If the manual transaction you attempted in the previous step does not work, check the telephone line using another telephone base unit or another Omni 3200 terminal.

2. If the problem appears to be with the telephone line, check with the party you are trying to call to see if their system is operational. If they are not experiencing difficulties with their line, contact the telephone company to have your line checked.

3. If the telephone line works, contact your local VeriFone representative for assistance. The terminal may be defective.

Keypad Does Not Respond

1. Check the display panel. If it displays the wrong character, or nothing at all, when you press a key, please follow the steps outlined above in "Terminal Display Does Not Show Correct or Readable Information."

2. If pressing a function key does not perform the expected action, refer to the user documentation for your specific application to be sure you are entering data correctly.

3. Perform a local diagnostic test of the keypad function in System Mode. (See Table 8 in the section, "Performing System Mode Operations.")

4. If the problem persists, contact your local VeriFone representative for assistance.

Bar Code Reader Does Not Work

1. Check all bar code reader (or bar code wand) cable connections.

2. Draw the wand across a different bar code to ensure that the problem is not an unreadable bar code.

3. Perform a bar code reader test in System Mode. (See Table 10 in the section, "Performing System Mode Operations.")

4. If the problem persists, contact your local VeriFone representative for assistance.

Maintaining the Omni 3200

Cleaning the Terminal

To remove dirt from your terminal, use a clean cloth dampened with water and mild soap. To remove stubborn stains, use alcohol or an alcohol-based cleaner.

Caution: Never use thinner, trichloroethylene, or ketone-based solvents to clean the terminal because they may cause plastic parts to deteriorate.

Cleaning the Printer

Every few months, check and thoroughly clean the printer:

1. Be sure the terminal is connected to a power source.

2. Remove the paper roll cover.

3. Remove the paper roll and spindle from the roll cradle. Carefully cut the paper in the feed mechanism from the roll.

4. Press the paper feed button to remove the remaining paper from inside the feed mechanism.

Caution: Do not attempt to pull paper out from the back of the printer. This could damage the paper feed mechanism.

5. Remove any dirt, dust, or scraps of paper that may be adhering to, or lodged in, the printer parts.

6. Re-install the paper roll.

7. Check the paper roll cover for signs of damage, wear, or warping.

8. Press the paper feed button to advance the paper through the slot below the serrated metal strip and replace the paper roll cover.

Returning a Terminal for Repair or Replacement

> **Note:** Unless otherwise instructed in this Manual, do not, under any circumstances, attempt any service, adjustments, or repairs on this product. Instead, contact your local VeriFone representative. Service conducted by parties other than VeriFone may invalidate our warranty.

Before returning a terminal to VeriFone, you must first obtain a Merchandise Return Authorization (MRA) number. The following procedure describes how to return one or more terminals for repair or replacement (for U.S. customers only):

1. Before you contact the VeriFone MRA Department, please gather the following information:

    •   Model(s) to be returned. A model and part number are located on the bottom of each terminal.

    •   Serial number(s) of the terminal(s) to be returned. A serial number (S/N XXX-XXX-XXX) is located on the base of each terminal, just above the bar code.
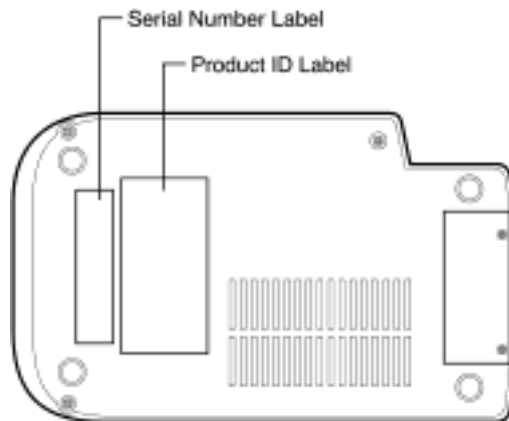
Figure 20 Product Information on the Terminal Base

- Brief description of the problem(s).

- Your billing address.

- Your shipping address. This is where the repaired or replacement unit(s) will be returned.

2. From inside the U.S., call the VeriFone Service Center at 800-834-9133 toll-free, or at 502-425-1332.

Note: If you are located outside the U.S., your local VeriFone representative will assist you with this return or replacement procedure.

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3. Select the MRA option from the automated message. The MRA Department is open from 7 a.m. to 5 p.m. Pacific Standard Time.

4. Give the MRA representative the information you gathered in Step 1.

5. If the list of serial numbers is long, you can fax the list, along with the information gathered in Step 1, to the MRA Department. Include a telephone number where you can be reached and your fax number.

   Please print clearly and send your fax to the attention of the 'VeriFone MRA Dept.' at 502-329-5947 or 502-329-5938. (These fax numbers are in the U.S.). You will be issued an MRA number and the fax will be returned to you.

6. Please note that one MRA number must be issued for each terminal you return to VeriFone, even if you are returning several terminals of the same model (Omni 3200).

7. Be sure to record and keep:

- MRA number(s)

- Serial numbers of all the terminals your are returning

- Shipping documentation (such as airbill numbers)

Calling the VeriFone Customer Support Hot Line

If you cannot resolve a problem you are experiencing with your Omni 3200 terminal using these troubleshooting tips, or if a local VeriFone representative is not readily available to assist you, call the following numbers for assistance:

- For general information about VeriFone products, or to find out who your local VeriFone representative is, call the VeriFone Customer Support Hot Line at 1-800-654-1674. (This number is toll-free for calls made within the United States.)

- To inquire about repairing or replacing a VeriFone product, call the VeriFone Service Center at 1-502-425-1332. (This telephone number is for U.S. customers only. For locations outside the U.S., please contact your local VeriFone representative.)

Specifications

Power

- Terminal power input requirements:

    22 V AC at 2 A (U.S.)

    25.5 V DC at 1.57 A (International)

- Power pack input requirements:

    AC power pack: 120 V AC at 60 Hz (U.S.)

    DC power pack: 100–250 V AC at 50–60 Hz (International)

Environmental

- Operating temperature: 0° to 40° C (32° to 104° F)

- Storage temperature: – 18° to + 66° C (0° to 150° F)

- Humidity: 15% to 95% relative humidity; no condensation

Dimensions

- Height: 75 mm (2.95 inches)

- Width: 146 mm (5.75 inches)

- Depth: 290 mm (11.4 inches)

Weight

- Terminal unit weight: 1050 g (2.3 lb)

- Shipping weight: 2750 g (6.1 lb); includes terminal, power pack, telephone line cable, paper roll, and plastic spindle

Terminal Accessories

How to Order

Ordering VeriFone accessories and consumable supplies is now easier than ever. The VeriFone Online Store, on the Internet at the address *http://www.store.verifone.com*, provides easy access and secure ordering for products and accessories, as well as up-to-the-minute information about other VeriFone countertop systems.

From inside the United States, you can also call in your accessories order to the VeriFone Customer Development Center, toll-free, at 1-800-233-0522. If you are located outside the United States, contact your local VeriFone representative for information about ordering.

Accessories and documentation you can order for the Omni 3200 are listed below. When ordering, please refer to the part number in the left column.

Download Cables

05651-XX	MOD10-MOD10 (Terminal-to-terminal, RJ45-type connectors)
26263-XX	O2XXX MOD10-PC DB25F (Computer-to-terminal, DB25-type connector)
26264-XX	O2XXX MOD10-PC DB9F (Computer-to-terminal, DB9-type connector)

Cables for Optional Peripherals

07041-XX	MOD10-MDIN9 (for CR 600 check reader)
07042-XX	MOD10-4P4C (for all VeriFone PINpads)

Telephone Line Cord

00124-03	2.1-meter (7-foot) telephone line cord, silver color, with modular RJ11-type connectors

Power Packs

07096-01G	AC power pack (U.S. version) (120 V AC to 22 V AC)
05790-XX	DC power pack ("all open" version) (120 V AC to 25.5 V DC)

Thermal Printer Paper

CRM0039	High-grade thermal printer paper, 58-mm (2.25-inch) width; single roll
CRM0039-01	High-grade thermal printer paper, 58-mm (2.25-inch) width; bulk package

Paper Roll Spindle

02117-03	Plastic spindle for 58-mm (2.25-inch) rolls of thermal printer paper

Documentation

05996	*Omni 3200 Installation Guide*
19134	*Omni 3200 Reference Manual*
19135	*Omni 3200 Programmer's Guide*
12941	*Omni 300 Series Terminal Programmer's Manual, Volume I and II*

Appendix A.
System Messages

BAD RAM

This error message, which may be displayed during a Destructive Memory Test, indicates that the terminal's static random access memory (SRAM) is defective. If you see this message, contract your local VeriFone representative for assistance.

,*,*,*,*,*,*,*,*,*,*,*

This string of commas and asterisks appears when you press the [BACKSPACE] key during a Telco test using the local System Diagnostics function in System Mode. (To initiate this test, you press the [4] key in System Mode.) This character string is displayed when the Telco function disconnects from the telephone line.

*0,

This character string is displayed when performing a Telco test using the local System Diagnostics function in System Mode. (To initiate this test, you press the [4] key in System Mode.) When you have verified that the DTMF function works properly and press [FUNC/ENTER], the '*0,' string appears in the top right corner of the display and the DTMF function is automatically turned off.

OOOOOOOOOOOOOOOO

A string of 16 letter O's is displayed when you press the [ALPHA] key during a Telco test using the local System Diagnostics function in System Mode. The string of O's indicates two conditions: 1) the Telco or Telset connection of the Omni 3200 terminal has been established, and 2) the dual-tone multiple-frequency (DTMF) function of the terminal's internal modem is turned on.

*T=

This prompt appears when you initiate a remote diagnostics session, but the terminal's CONFIG.SYS file does not contain the remote computer's dial-up telephone number. At the prompt, key in the complete number of the remote diagnostic host and press [FUNC/ENTER] to store the variable in the *T record. In System Mode, you can at any time press [7] to invoke the keyed file editor and enter the *T variable directly into the CONFIG.SYS file.

*ZA=

This prompt appears when you request an application download and the terminal's CONFIG.SYS file does not contain the application program ID. At the prompt, key in the correct application program ID and press [FUNC/ENTER] to store the variable in the *ZA record. In System Mode, you can at any time press [7] to invoke the keyed file editor and enter the *ZA variable directly into the CONFIG.SYS file.

*ZP=

This prompt appears when you request an application download and the terminal's CONFIG.SYS file does not contain the download computer's dial-up telephone number. At the prompt, key in the complete telephone number of the download computer and press [FUNC/ENTER] to store the value in the *ZP record. In System Mode, you can at any time press [7] to invoke the keyed file editor and enter the *ZP variable directly into the CONFIG.SYS file.

*ZT

This prompt appears when you request an application download and the terminal's CONFIG.SYS file does not contain a ZONTALK terminal ID. At the prompt, key in the correct terminal ID and press [FUNC/ENTER] to store the value in the *ZT record. In System Mode, you can at any time press [7] to invoke the keyed file editor and enter the *ZT variable directly into the CONFIG.SYS file.

KB RAM

This prompt appears when you enter System Mode and press the [2] key twice. The display indicates the size of the terminal's SRAM. For example, 512 KB RAM. Other optional SRAM sizes for the Omni 3200 terminal are 128 KB, 256 KB, 896 KB, and 1000 KB (1 MB).

AGAIN

The terminal is requesting that you verify the new System Password you just entered. Re-enter the password and press [FUNC/ENTER].

BAD EPROM

This error message indicates that a checksum error occurred in the terminal's flash EPROM memory. If the error message persists, contact your local VeriFone representative for assistance.

BAD LRC

This error message is displayed during the card reader test if the terminal detects a bad LRC (Longitudinal Redundancy Check) in the magnetic stripe card data. If this occurs, try the test again with a different card. If the message persists, contact your local VeriFone representative for assistance.

BAD PARITY

This error message appears during the magnetic stripe card reader test if the terminal detects a parity error. If this occurs, try the test again with a different card. If the message persists, contact your local VeriFone representative for assistance.

BUSY

The BUSY message is displayed if your terminal attempts to establish a dial-up telephone connection with a remote computer, and the line is currently in use. Try again later.

CHANGE DATE/TIME

This prompt appears briefly when you press [5] while in the System Mode. The terminal then displays YYMMDD (year, month, date). Enter the current date and press [FUNC/ENTER]. The prompt HHMMSS (hours, minutes, seconds) is then displayed. Enter the current time and press [FUNC/ENTER].

CHANGE PASSWORD

This prompt indicates that you requested a password change. Wait for the next prompt to appear and continue the password entry procedure.

CONNECTED

This message is displayed if the terminal successfully connects to a remote download computer over a dial-up telephone line connection.

DIAL

This prompt appears during an application download to indicate the terminal is ready to dial the remote download computer. As the terminal dials each digit of the remote computer's telephone number, the digit is displayed to the right of the DIAL prompt.

DOWNLOAD DONE CP

The message, DOWNLOAD DONE, indicates that the software download was completed successfully. The information directly to the right of DOWNLOAD DONE indicates whether or not the clock and password were reset: The letter 'C' indicates the date and/or time was reset. The letter 'P' indicates that the password was changed during the download. The letters 'CP' together indicate that both the date/time and the password were modified during the operation.

DOWNLOAD FAILED

This message indicates that the terminal could not complete the attempted download. Press any key to return to the System Prompt and try again. If the download fails again, the problem may be due to a problem with the remote download computer, or you may be attempting to download an application that does not exist. Check all telephone line connections, the download computer telephone number, and the application ID of the application you are trying to download. Then, try again. If you continue to have problems with the download, contract your local VeriFone representative for assistance.

DOWNLOAD NEEDED

This message appears when a terminal does not have an application program stored in its memory. To use the terminal to process transactions, you must download an application program from a download computer or from another terminal.

EDIT

This prompt appears when you activate the keyed file editor in System Mode by pressing the [7] key and then press [BACKSPACE]. You can now enter the name of a keyed file other than CONFIG.SYS, or you can create a new keyed file. Enter the name of the file and press [FUNC/ENTER].

EDIT CONFIG.SYS

This prompt appears when you press [7] from within System Mode. Press [FUNC/ENTER] to activate the keyed file editor to add or modify records in the terminal's CONFIG.SYS file. Press [BACKSPACE] to return to the EDIT prompt.

(EMPTY)

This message appears to the right of the key of a keyed file record if no variable data is stored under that key. For example, *ZT= (EMPTY). To add a variable to the record, press [BACKSPACE] to delete the (EMPTY) prompt, type in the desired information, and press [FUNC/ENTER]. If you do not want to add any information, press [CLEAR] to return to the System Prompt. The keyed record remains "empty."

--EXEC ERROR nn

This error message indicates that an unexpected application program error occurred. Download the application program again. If the error message persists, contact your local VeriFone representative for assistance.

FATAL MEMORY ERR

This error message indicates an error occurred in the terminal's volatile RAM. Download the application program again. If the error message persists, contact your local VeriFone representative for assistance.

FILE ERROR

This error message indicates that the CONFIG.SYS or another other file in the terminal memory has been corrupted. Create a new CONFIG.SYS file, or download the application program again to your terminal to re-initialize the application memory.

FILE SYS CORRUPT

This error message indicates that the terminal's file system has been corrupted. Contact your local VeriFone representative for assistance.

Fr

Abbreviation for Friday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

HHMMSS

The terminal is prompting you to enter the current time in the 24-hour format. Enter two-digit numbers for the hours, minutes, and seconds followed by [FUNC/ENTER]. For example, if the time is 9:45 a.m., enter '094500'. If the time is 3:34 p.m., enter '153400'.

INT. PRINTER TEST

This message is displayed when you press [9] in System Mode to initiate a test of the integrated printer. The message continues to be displayed while the test printout is being completed.

INVALID *GO PARM

This error message is displayed if the CONFIG.SYS variable *GO is set to something other than a valid executable file that is currently loaded in the terminal.

MEMORY -OK-

This message is displayed alternately with the message MEMORY TEST while an internal memory test is running. If this message is displayed at the end of the test, the terminal's memory is in good condition. To exit the test, press any key on the core keypad.

MEMORY ERROR

This message indicates that the terminal's memory is not initialized properly and may appear after a Destructive Memory Test. To clear the error, you must download a new application program to the terminal.

MEMORY TEST
MEM WILL BE LOST
PRESS FUNC IF OK

These messages are displayed in sequence when you initiate a Destructive Memory Test in System Mode by pressing the [BACKSPACE] key. Press [FUNC/ENTER] if you want to proceed with the test. To exit the test procedure and return to the System Prompt, press any key other than [FUNC/ENTER].

Mo

Abbreviation for Monday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

NEW?

The terminal is requesting that you enter a new System Password. Enter the new password and press [FUNC/ENTER]. (Be sure to write down the new System Password and store it in a secure location.)

NO ANSWER

This prompt indicates that there was no answer when the terminal modem attempted to dial a remote computer for a ZONTALK or VeriTalk software download over a telephone line.

NO DATA

This error message is displayed during a card reader test in local System Diagnostics mode ([4] key in System Mode) if no data can be read from the card's magnetic stripe. Try another card to make sure the magnetic card is not defective.

NO DIALTONE

This message is displayed if the terminal modem attempts to dial the telephone number of a remote computer and cannot get a dial tone on the line to which it is connected. Check the telephone line using another terminal or a telephone base unit.

NO ETX

This message appears during a card reader test if the terminal cannot detect an ETX (End of Text) character in the data on a magnetic card. If this occurs, try again with a different card. If the message persists, contact your local VeriFone representative for assistance.

NO LINE

This message indicates that no active phone line was connected to the terminal's modem (Telco or Telset port) when the terminal attempted to dial a remote ZONTALK or VeriTalk download computer. Check the telephone line connection.

NO STX

This message is displayed during a card reader test in System Mode if the terminal cannot detect an STX (Start of Text) character in the data on a magnetic card. If this occurs, try the test again with a different card. If the message persists, contact your local VeriFone representative for assistance.

NO SUCH FILE

This message appears when you enter the name of a keyed file in response to the EDIT prompt, and the file does not exist. Press [FUNC/ENTER] to create the file and go to the RECALL? prompt. Or, press [CLEAR] to return to the System Prompt.

OLD?

The terminal is requesting you to enter the current System Password which you want to modify. Key in the current password and press [FUNC/ENTER].

PART=* FULL=FUNC

When this blinking prompt is displayed during an application download, press [*] if you want a partial download or press [FUNC/ENTER] if you want a full application download.

PARTIAL DOWNLOAD

To select a partial application download, you press [*] while the message UNIT RECEIVE is being displayed. The PARTIAL DOWNLOAD message indicates that the terminal is now ready to receive a partial direct application download.

PARTIAL OR FULL?

This prompt is displayed when you request an application download from a remote computer. It is followed immediately by the blinking prompt, PART=* FULL=FUNC. Press [*] if you want a partial download or press [FUNC/ENTER] if you want a full application download.

PROGRAM ERROR

This error message indicates that the application program stored in the terminal's memory has been corrupted and can no longer be used. Download the application program again to re-initialize the memory.

RECALL?

The RECALL? prompt indicates that the keyed file editor wants you to enter the key of a record in the keyed file you are currently editing. To activate the keyed file editor, you press [7] while in System Mode. At this point, you can type the key of the record you want to edit, or you can press [FUNC/ENTER] to display the RECALL? prompt. If you press RECALL? repeatedly, the keyed file editor will display all of the records in the file, one by one. Press [CLEAR] once to return to the RECALL? prompt or twice to exit the keyed file editor and return to the System Prompt.

REMOTE DIAG

This message indicates that the terminal is ready to initiate a system diagnostics session with a remote diagnostic computer. To select the remote diagnostics function, press the [8] key in System Mode.

Sa

Abbreviation for Saturday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

--STACK TOO BIG

This error message is displayed when the application program requires a larger stack size than the terminal memory has space for. Download the application program again. If the error message persists, contact your local VeriFone representative for assistance.

Su

Abbreviation for Sunday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

SYSTEM DIAG

This message is displayed when you press the [4] key in System Mode to initiate a series of local tests of system devices such as the magnetic card reader and the Telco connection. When you activate local System Diagnostics mode, you can manually perform up to four system device tests in any order.

SYSTEM DIAG1234567890

In local System Diagnostics mode, entered by pressing the [4] key in System Mode, you can test the keyboard and display panel by keying in a series of digits. You would see the above message if you press the numeric keys 1 through 9 and 0 in sequence.

SYSTEM PASSWORD?

The terminal is requesting that you enter the System Password as a prerequisite to entering System Mode. Key in the password and then press [FUNC/ENTER]. The default password for the Omni 3200 terminal, which is pre-set at the factory, is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1]. It is recommended that you change the System Password immediately after you receive the terminal.

SYSTEM= VPQXXYYZ

This prompt, which is called the System Prompt, indicates that the terminal is running in System Mode. The alphanumeric code which appears to the right of the SYSTEM= prefix is the version ID of terminal's firmware, in VPQXXYYZ format.

Th

Abbreviation for Thursday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

Tu

Abbreviation for Tuesday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

UNIT ID

This message is displayed when you press the [2] key in System Mode. The terminal's unit ID consists of two components: a 2-digit manufacturer ID ('12' = VeriFone) and a unique 8-digit terminal ID. If the terminal ID is a string of zeros, the terminal does not have a permanent ID (PTID), which can optionally be assigned at the factory.

UNIT RECEIVE

The UNIT RECEIVE message is displayed when you press [#] in System Mode to receive a direct download from a download computer or another terminal.

UNIT SEND

The UNIT SEND prompt is displayed during a terminal-to-terminal upload when you press [*] to upload the data into the memory of the receiving terminal. After this prompt is displayed for a few seconds, the terminal display then shows the hexadecimal address of the memory blocks being uploaded.

We

Abbreviation for Wednesday. This appears as part of the date and time prompt when you use the date/time function in System Mode.

YYMMDD

The terminal is prompting you to enter the current date. From the core keypad, enter two-digit numbers for the year, month, and date and the press [FUNC/ENTER]. For example, if the current date is August 24, 1999, enter '990824'.

ZONTALK DOWNLOAD

This message appears when you press [0] in System Mode. The ZONTALK DOWNLOAD message indicates that the terminal is ready to receive a download from a remote computer running ZONTALK 2000 (or VeriTalk Enterprise System 1.3) software. After displaying this prompt for several seconds, the terminal will ask if you want to execute a partial or full download.

Appendix B.
ASCII Table

An ASCII table for the Omni 3200 display is presented as Figure B-1 below. The table is formatted for quick reference, as follows:

- The letters and numbers in the column to the left of the table and in the row above the table are, when combined, the hexadecimal value of an ASCII character located in the corresponding row and column coordinate.

- The numbers shown in white on a black background within the table itself are the decimal value of the ASCII character in that table cell.

- The large character located in the middle of each cell is the ASCII character.

For example, to determine the hexadecimal value of the plus (+) sign:

1. Locate the plus sign ASCII character in the table (decimal 43).

2. From this position, follow the row to the left and view the hexadecimal value in the column outside the table. This value (2) is the first character of the ASCII character's hexadecimal value.

3. Now, from the plus sign, follow the column to the top of the table and view the hexadecimal value in the row above the table. This value (B) is the second part of the hexadecimal value.

4. The hexadecimal value for the ASCII plus sign (+) is therefore 2Bh.

Figure B-1   ASCII Table for the Omni 3200 Display

Appendix C.
Glossary

ABA. Abbreviation for 'American Bankers Association'. The Omni 3200 card reader can read ABA information stored on track 2 of a card's magnetic stripe.

Access Code. A code number dialed to gain access to a telephone line, such as dialing the number '9' to reach an outside line.

ACK. Short for 'positive acknowledgment'. An ACK signal confirms that the previous messages sent from one device to another were received correctly. See also 'Control Characters'.

Application ID. An alphanumeric code that identifies an application program downloaded to a terminal from a download computer. For ZONTALK application downloads, the application ID is stored in the CONFIG.SYS record which begins with the *ZA. key. An Omni 3200 application ID can be up to 21 characters long.

Application Program. The ordered set of programmed instructions by which a computer performs an intended task or series of tasks.

Application Prompt. The information shown on the terminal's display panel when power is applied to the terminal, assuming that an application program has already been downloaded into the terminal's memory. The application prompt often contains the date and time, but it can consist of anything the programmer chooses for that purpose.

ASCII. Abbreviation for 'American Standard Code for Information Interchange'. A 7-bit code (with no parity bit) that provides a total of 128 bit patterns. ASCII codes are widely used for information interchange in data processing and communication systems.

Asynchronous Communication. A system in which each event or operation starts as a result of a signal that the previous operation is complete and the microcomputer is now ready for the next operation. Asynchronous machines do not use a master clock for overall control. See 'Synchronous Communication'.

ATM. Abbreviation for 'Automated Teller Machine'. The Omni 3200 magnetic stripe card reader can read data stored on track 3 of a standard ATM card.

Bar Code. Optical binary code imprinted on merchandise in retail stores. To support specific applications, an optional bar code reader can be attached to the Omni 3200 to read and process bar codes.

Bar Code Reader. A pencil- or wand-shaped optical scanner used to read bar codes. To read the code, you drag the tip of the bar code reader across the length of the bar code, in a left-to-right or right-to-left direction.

Baud. The number of times per second that a system, especially a data transmission channel, changes state. The state of a system may represent a bit, digit, or symbol. For a POS terminal, the baud rate indicates the number of bits per second that are transmitted or received by the terminal's serial ports and modem.

BCC. Abbreviation for 'Block Check Character'. The result of a transmission verification algorithm accumulated over a transmission block, and normally appended at the end. Block checks are performed in longitudinal and cyclical redundancy checks. See 'LRC'.

Bit. Short for 'binary digit'. Either of the two digits 0 and 1 in the binary number system. Also, a unit of information equal to one binary decision. The bit is the smallest unit of storage and hence of information in any binary system within a computer (or terminal).

Block. A collection of data units such as words, characters, or records (generally more than a single word) that are stored in adjacent physical positions in memory or on a peripheral storage device. A block can therefore be treated as a single unit for reading, writing, and other data communication operations.

Boot Loader. Also called a 'bootloader' or 'bootstrap loader'. A short program, stored in the flash EPROM, that allows the terminal to continue operating during an operating system download procedure until the new operating system has been completed downloaded into the terminal's memory.

Buffer. A temporary memory for data, normally used to accommodate the difference in the rate at which two devices can handle data during a transfer.

Byte. A term developed to indicate a measurable number of consecutive binary digits that are usually operated on as a unit. For the Omni 3200, a byte consists of eight bits. See also 'Bit'.

Calendar/Clock Chip. A microchip inside the Omni 3200 terminal which keeps track of the current date and time.

Card Reader. Also called a 'magnetic stripe card reader'. The slot on the right side of the Omni 3200 terminal that automatically reads data stored in the magnetic stripe on the back of a specially-encoded card when you swipe the card through the slot. In a typical credit card, for example, the single magnetic stripe can contain up to three data tracks.

Carrier. Usually, an analog signal that is selected to match the characteristics of a particular transmission system. The carrier signal on a phone line is modulated with frequency or amplitude variations to allow a terminal to transmit or receive data using a modem.

Character. An element of a given character set. Also, the smallest unit of information in a record. A letter, numeral, or other symbol that is used to express information.

Command Packet. A packet sent from a diagnostic or debugging computer containing a command or control code for the terminal to execute. See also 'Packet'.

CONFIG.SYS File. A special keyed file that is stored in terminal memory and which contains system and application configuration parameters. Each record in the CONFIG.SYS file is identified by an alphanumeric key. You can modify CONFIG.SYS records using the keyed file editor. See 'Keyed File Editor'.

Control Character. A character that when typed at a keyboard or sent to a peripheral device is treated as a signal to control operating functions. Also, a character that initiates, modifies, or stops a control operation.

CPU. Abbreviation for 'central processing unit'. The principal operating part of a computer system that controls the interpretation and execution of instructions stored in memory.

Cyclic Redundancy Check. Also called 'Cyclic Redundancy Code' or 'CRC'. The most widely used error-detection code for data transfers. In a block data transfer, extra digits are appended to each block to provide a means of checking the data for errors that may have occurred during transmission.

Data. Information prepared, often in a particular format, for a specific purpose. Data is to be distinguished from applications program instructions. In a POS terminal, application files and data files are stored in non-volatile memory, or SRAM.

Data Entry. The process of using a keyboard, card reader, or other device to input data directly into a system.

Data Packets. A group of bits of fixed maximum size and well-defined format that is switched and transmitted as a composite whole through a packet switching network. Any message that exceeds the maximum size is partitioned and carried as several packets. The packets are formed by the controller in the sending data terminal and the data is extracted and reassembled by the controller at the receiving end.

Debugging. The process of detecting and solving errors (bugs) in a program. The Omni 3200 terminal has built-in debugging support that allows it to receive and execute debugging commands from a computer connected to its serial port.

Dedicated Line. A leased or private telephone line that is used for a particular communications purpose, such as to connect a terminal to a host computer. See 'Leased Line'.

Default. A value, parameter, options, or attribute that is assigned by the program or system when another has not been assigned by the user.

Delete. To remove a record, field, or item of data.

Diagnostics. Techniques employed for detection and isolation of malfunctions and errors in programs, systems, and devices. In a diagnostic test, a program or routine is run to detect failures or potential failures. These tests and routines help detect and isolate problems in a terminal or peripheral device.

Diagnostic Counters. A collection of user-defined and operating system statistical counts used for diagnostic evaluation. Counter values accumulate until a command is issued by the diagnostics software to clear them. Diagnostic counters keep track of the number of times particular events, such as key presses or power-on cycles, occur.

Dial-Up Line. A standard public telephone line. The switching equipment on a dial-up line requires that a party dial the other party before a connection can be made.

Direct Computer Download. The process of transferring an application program and/or data from a download computer to the terminal. The terminal and the computer are directly connected by a serial cable.

Display. The small screen on the Omni 3200 terminal. Besides showing fully-formed numerals, letters, punctuation symbols, and graphics, the display also shows information entered from the core keypad, as well as system prompts and messages.

Download. To send programs or data from a central or controlling computer to a remote terminal.

DTMF. Dual-Tone Multi-Frequency. The ordinary dial tone on a telephone line.

EM Code. Encoding Machine code. In a terminal debugging procedure, an internal binary code which represents the application program being interpreted by the terminal's operating system. Debugger commands executed on a host computer can, for example, request that the EM code currently being executed on the terminal be sent back to the host.

ENQ. Abbreviation for 'end-of-inquiry'. A transmission control character used as a request from a remote station. An ENQ is commonly used to initiate a data transfer.

EOT. Abbreviation for 'end-of-transmission'. A character sequence on a data link indicating that the current transmitter has nothing further to send.

EPROM. Acronym for 'Erasable Programmable Read-Only Memory'. A type of memory chip that can be re-programmed a number of times by the user. The EPROM usually contains permanently stored information, such as the operating system, a bootloader program, and system prompts. The Omni 3200 flash EPROM can be overwritten and, unlike an ordinary EPROM, does not need to be removed from the terminal to be erased.

ETX. The 'end-of-text' character. Sent from one communicating entity to another to terminate a single complete block data transfer operation. The sending device transmits an ETX when it completes a transfer; the receiving device acknowledges the satisfactory receipt of the block with an ACK. (In a block transfer, an EXT immediately precedes the block check character, BCC.) See also 'ACK', 'BCC', and 'STX'.

Firmware. System software (including the operating system, bootloader, default display font, and system messages) that is stored in the Omni 3200 flash EPROM.

Fixed Prompt. A system prompt or message that is stored as part of system firmware in the terminal's flash EPROM. Fixed prompts appear on the terminal display to alert the user to specific system occurrences or malfunctions, and to prompt the user to enter specific information or select options.

Handshaking. An exchange of signals that establishes communications between two or more devices. The handshake synchronizes the devices, such as a download computer and a terminal, and allows data to be transferred successfully.

Header. Coded information that precedes a more general collection of data and which gives details about it. For example, the length of a data block or how packets are to be routed. For transmitting a data block or packet, the header may contain such items as a command or record search key. See also 'Block' and 'Packet'.

Host Computer. The primary or controlling computer in a multiple computer operation. Also, a computer used to prepare programs for use on another computer or on another data processing system, for example, a Point-of-Sale (POS) terminal. Host computers are also used to process transactions that originate from a distributed network of POS terminals.

IATA. International Air Transport Association. The Omni 3200's card reader can read IATA information stored on Track 1 of a credit card's magnetic stripe.

Input. The process of entering data into a processing system or a peripheral device such as a terminal, or the data that is entered.

Interface. A common boundary between two systems, devices, or programs. Also, to interact.

Keyed File Character Set. A limited set of 95 ASCII characters, from 00h to 5Fh (or 0 to 95 decimal), that is used by the Omni 3200 keyed file editor. Although an application program can download all 95 characters in this set, you can only enter 50 of these characters from the terminal keypad: 0–9, A–Z, and 14 special characters.

Keyed File Editor. A keyed file editor lets you modify records stored in a keyed file, such as CONFIG.SYS. In the Omni 3200 System Mode, you press [7] to invoke the keyed file editor. See 'CONFIG.SYS File'.

Keyed File Record. ASCII data, or variables, stored in the terminal's CONFIG.SYS file. A keyed file record consist of two parts: a search key that identifies the record, and the data or variable stored in the record. See 'CONFIG.SYS File'.

Keypad. A small keyboard or section of a keyboard containing a smaller number of keys, generally those used in simple calculators. These 10-, 20-, or 16-key units are often the simplest input devices to microcomputers. The 16-key core keypad of the Omni 3200 terminal is used to enter data and perform operations.

Leased Line. A private telephone line leased from the phone company. See 'Dedicated Line'.

Line Cord. A telephone-type cord with modular plugs on each end for connecting the terminal to a dial-up telephone line.

Local Functions. Operations performed at the terminal only and not in interaction with a host computer. For the Omni 3200, local functions are usually performed in System Mode. See 'System Mode'.

LRC. Longitudinal Redundancy Check. In the transmission of data packets over a switched network, the LRC is a redundancy check which is included at the end of each packet, following the ETX. This check helps ensure that data received is the same as data sent. See also 'ETX'.

Manual Transaction. A transaction involving the manual entry of account information from the terminal keypad instead of automatic entry of the information from a reading device, such as a card reader.

Memory. A device or medium that can retain information for subsequent retrieval. The term is most frequently used to refer to the internal storage of a computer (or a terminal) that can be directly addressed by operating instructions.

Memory Dump. A procedure that shows the contents of a terminal's memory at a specified point in time. This procedure is sometimes used for debugging problems in program code.

Messages. Words and symbols appearing on the display panel which inform the user of the terminal of the result of a process, or if an error has occurred. (In this document, the term 'prompt' is used when the displayed message is requesting the user to enter information or to select an option.)

Modem. Short for 'modulator and demodulator'. A device that can convert a digital bit stream into an analog signal suitable for transmission over some analog communication channel (modulation), and can convert incoming analog signals back into digital signals (demodulation). The Omni 3200 internal modem lets the terminal communicate with a host computer over a dial-up telephone line.

NAK. Short for 'negative acknowledgment'. In data communications, a signal sent by the receiver as a negative response to the sender to indicate that the previous block was unacceptable and the receiver is now ready to accept a transmission.

Non-Volatile Memory. A memory or storage medium that retains data in the absence of power so that the data is available upon restoration of power. For the Omni 3200, application code files, data files, and the communications buffer pool are stored in non-volatile memory, or SRAM. See 'Volatile Memory' and 'RAM'.

Normal Mode. The Omni 3200 terminal's operating mode for normal transaction processing. When the terminal is connected to a power supply, the application starts and displays the application prompt, indicating that the terminal is in Normal Mode. See also 'System Mode'.

Packet. A group of bits of fixed maximum size and well-defined format that is switched and transmitted as a composite whole through a packet switching network. Any message that exceeds the maximum size is partitioned and carried as several packets.

Packet-Switched Networks. Networks of computers or computing devices in which communication resources are allocated dynamically on a variety of levels to multiple communicating entities. Messages between entities are partitioned into segments, or packets, with a fixed maximum size.

Parameter. A variable that is usually assigned a constant value for a specific subroutine, procedure, or function. Parameters stored in a terminal's memory, or in its CONFIG.SYS file, enable a host or download computer to identify to the terminal's configuration.

Password. A group of characters used to identify a user to a computer system so that they may gain access to the system or part of that system. Passwords are used to ensure the security of computer systems by regulating the amount of access freedom. The password for the Omni 3200 is called the 'System Password'.

PC. Abbreviation for 'personal computer'. Usually, PC refers to an IBM-compatible personal computer.

Peripheral Device. In a computer system, any equipment that provides the processing unit with outside communication. Typical peripheral devices for a POS terminal include PINpad, bar code wands, and check readers.

PIN. Abbreviation for 'personal identification number'. A 4-digit to 16-digit confidential code used to identify a person as the proper user of a credit or debit card. During transaction processing, a terminal user is commonly requested to enter a PIN using an attached PINpad device. The PIN must be verified, in communication with a host computer, in order to complete the transaction.

PINpad. Also 'PIN pad'. A small terminal used for entering Personal Identification Numbers (PINs). PINpads can encrypt PINs before sending them to a host computer. Some PINpads are equipped with built-in, magnetic-stripe card readers.

Port. An opening or connection that provides electrical or physical access to a system or circuit. Also, a connection point with associated control circuitry that allows I/O devices to be connected to the internal bus of a microprocessor.

POS Terminal. A terminal used at the 'Point Of Sale', which is usually at a merchant's locale where the customer pays for goods or services received. Information concerning the sale can be entered into the terminal and transmitted to a remote host computer for verification and processing.

Power Pack. A unit for transforming and converting electrical power from one AC voltage level to another AC voltage level, or from AC to DC, for electronic devices.

Prompt. A short message, sent from a process to a user, indicating that the process expects the user to present fresh data. For example, a prompt appears on the terminal display asking the user to enter specific information.

Protocol. An agreement that governs the procedures used to exchange information between cooperating entities. For example, protocols govern the format and timing of messages exchanged between devices in a communication system, such as between a terminal and a host computer.

PTID. Acronym for 'permanent terminal ID'. Part of the unit ID of a VeriFone terminal which is permanently set at the factory. The unit ID consists of two components: a 2-digit manufacturer ID ('12' for VeriFone) and a unique 8-digit terminal ID. Upon customer request, unique terminal IDs can be injected into the terminal at the factory. If a PTID is not set, the terminal ID shows all zeros, or "1200000000". You can use the TXO library call '*SVC_INFO_PTID( )*' to display the PTID of an Omni 3200 terminal.

Pulse Dialing. A method of telephone dialing that specifies a phone number by the number of electrical pulses sent.

Queue. A linear list of data, located in memory, where all insertions are made at one end of the list and all removals and accesses at the other. Also, the waiting line for items, such as jobs or messages, to be serviced by the processor.

RAM. Acronym for 'random-access memory'. The type of memory in which storage locations are addressable and can therefore be accessed in any order. In a POS terminal, the SRAM (static RAM) is used to store custom applications and temporary data that is generated during a transaction. The contents of this memory can be changed by downloading a different application program. See 'Non-Volatile Memory'.

Remote Debugging. The use of remote terminals for the testing of programs. For POS terminals, the application running on the terminal, and other terminal functions, can be checked from a remote host computer over a dial-up telephone line. See 'Remote Diagnostics'.

Remote Diagnostics. For VeriFone POS terminals, a System Mode function that allows the terminal to receive and execute diagnostic commands sent from a remote computer. See 'Remote Debugging'.

Remote Host Computer. A host computer that is connected to a terminal over a dial-up telephone line. The opposite of 'remote' is 'local'.

Request to Send. One of the data set interchange messages defined in the EIA Standard RS-232. A request for information to be sent over a link from one communicating entity to another.

RS-232. Also 'RS232C'. A widely used standard interface that covers the electrical connection between data communication equipment, such as a modem, and data terminal equipment, such as a microcomputer or computer terminal. The RS232C interface standard was developed by the EIA (Electronic Industries Association) and is essentially equivalent to the CCITT's V.24 interface.

Scroll. To move all or part of the information displayed on a screen up or down, left or right, to allow new information to appear. For the Omni 3200, text that does not fit entirely within the 21-character wide display area can be scrolled to the left or right using the [#] and [*] keys.

SDLC. Abbreviation for 'synchronous data link control'. A data link control protocol developed and used by IBM, and based on the use of frames to delimit message boundaries.

Search Key. Also called 'key'. In the Omni 3200, a short character string that is used by an application to identify a keyed file record stored in the terminal's CONFIG.SYS file. For example, *ZA or *OT. A keyed file record consist of two parts: a search key that identifies the record, and the value or data stored in the record. See also 'Keyed File Record' and 'CONFIG.SYS File'.

Serial Port. A connection point through which digital information is transferred one digital bit at a time. Same as 'serial interface'. The Omni 3200 has two serial ports, labeled "RS232" and "Bar Code/PIN Pad." The main serial ports on a download or host computer are usually assigned the device IDs, COM1 and COM2.

SRAM. See 'RAM'.

STX. The 'start-of-text' character that is sent from one communicating entity to another to signal the start of a block data transfer. See 'ETX'.

Subroutine. A routine that can be part of another routine. When a main routine calls a subroutine, program control is transferred to the subroutine. When the subroutine is completed, control reverts to the instruction in the main routine immediately following the subroutine call.

Swipe. The action of sliding a magnetic stripe card through a terminal card reader. The Omni 3200 card reader has a bidirectional swipe direction. The user must hold the card so that the magnetic stripe is down and facing to the right.

Synchronous Communication. A system in which each event or operation is constrained by signals from a clock. A clock provides a constant time interval between bits, characters, and events.

System Mode. For the Omni 3200, the System Mode temporarily disables Normal Mode operations, allowing you to perform local functions such as downloads, diagnostics, and other operations that cannot be performed while the application program is running.

To prevent unauthorized manipulation of data after an application has been downloaded, the terminal requests the system password each time the System Mode is entered. Upon successful password entry, the SYSTEM= prompt is displayed. To enter System Mode, you must press the [FUNC/ENTER] and [7] keys simultaneously.

Entering and leaving the System Mode restarts the application program at its beginning, if one is active, causing any transaction in process to terminate. See 'Local Functions' and 'Normal Mode'.

System Password. A unique set of characters entered by the user to access the System Mode local functions of the terminal. A default password is supplied with each terminal. For the Omni 3200 terminal, the default password is [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1].

To prevent unauthorized access, the default password should be changed to a confidential password as soon as the terminal is deployed. The new password should be kept in a safe place, as it is impossible to restore the terminal's default password without sending the unit to VeriFone for service.

Telephone Download. The process of transferring an application program and/or data from a remote host or download computer to a terminal over a telephone line.

Telephone Jack. Also, 'telephone line wall jack'. You insert a modular connector into a telephone jack, or receptacle. Also, modular-type sockets for connecting telephone line cords. The Omni 3200 has two RJ45-type telephone jacks on its back panel: The 'Telset' jack is used for a pass-through connection and the 'Telco' jack is used for a direct connection to a telephone line wall jack.

Telephone Line. The standard telephone wiring connecting your phone or terminal to a local or private telephone company.

Terminal. Any device capable of sending and receiving data over a data communications channel, such as a telephone line or a RS-232 cable. Some terminals, such as the Omni 3200, can print receipts and display information and graphics on a screen.

Terminal ID. An alphanumeric code that identifies a terminal to a download computer. In this way, the download computer can determine what data or application programs to download to that terminal. For ZONTALK downloads, the Omni 3200 terminal ID is stored in the *ZT record in the CONFIG.SYS file. This variable should not exceed 10 characters in length. Compare with 'Permanent Terminal ID'.

Terminal Parameters. Parameters that relate to a specific terminal. Some terminal parameters are stored as data in keyed file records in the terminal's *CONFIG.SYS* file. See 'Parameter'.

Terminal-to-Terminal Upload. The process of copying the contents of one terminal's memory into another terminal's memory. Terminal-to-terminal application uploads require that the sending and receiving terminal be connected to each other by a serial cable.

Tone Dialing. Also called touch-tone dialing. A method of telephone dialing that uses different pitched tones to specify a phone number. See also 'DTMF'.

Track 1, 2, or 3 Data. Information stored on track 1, 2, or 3 (respectively) on a card's magnetic stripe, and which can be read by a magnetic card reader device.

Transaction. An exchange of data resulting in a transfer of goods, services, value, and/or information between two parties. Example: A customer provides a magnetic-stripe card to a merchant. The account number on the card is read via a VeriFone terminal. The terminal exchanges data with a host computer, which provides verification of the account's validity. The customer is then provided with goods, services, or information, and the merchant has value added to his account in exchange.

Truncate. To shorten a number, usually by one or more digits, when the number is placed in a memory location that is too small to store all of the digits. For example, 1.2345 is truncated to 1.23 when stored in a location that can hold only four characters.

TXO. VeriFone's 'Transaction eXpress Option'. An operating system that utilizes the standard C programming language. Also, the line of VeriFone products based on the TXO operating system.

Variable. A string of characters that is used to denote some value stored within the computer and which may be changed during execution. A variable may be internal to a program, in which case it is held in memory, or external if the program must perform an input operation in order to read its value. See 'Parameter'.

Volatile Memory. A type of memory whose contents are destroyed if the power supply to the memory is interrupted. When volatile memories are used for crucial applications, they can be backed up by batteries. Compare with 'Non-Volatile Memory'.

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