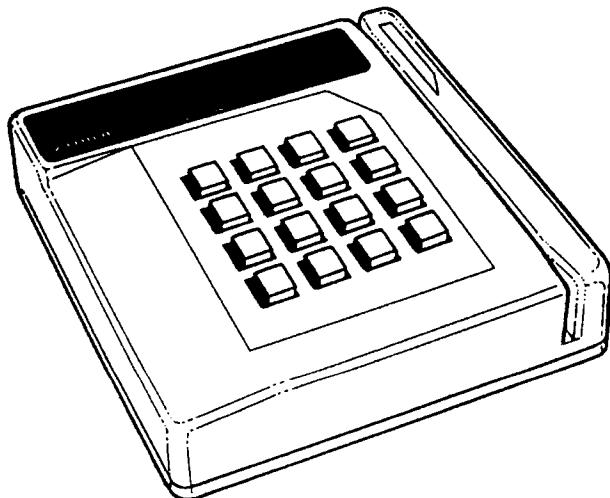


TCL Terminal Control Language Programmer's Manual

VeriFone Part Number 00368-01, Revision G
Manual Revision 8.0

For PNC 330/340, XL, TRANZ 330/340/380 Terminals



TCL Programmer's Manual

**VeriFone Part Number 00368-01, Revision G
Manual Revision Number 8.0**

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BABT Certification Information

Attention UK Users:

This special supplement describes commands, memory locations and their associated contents which, if misapplied, may invalidate BABT compliance. Carefully read this BABT Certification Supplement as it contains information that overrides any descriptions contained within the sections of this TCL Programmer's Manual.

The following commands can invalidate BABT approval if set to improper values.

+D Command: +D
 Description: DTMF Tone Dial
 Command Format: +Dt

This command causes the terminal to use DTMF to dial the characters in the destination buffer. Digits 0 thru 9, and characters * and # are permitted. The parameter "t" specifies the tone duration in multiples of 10 msec. The default is 7, which translates to 70 msec. The duration must not be set to a value of less than 70 msec, doing so will invalidate BABT compliance.

+T Command: *T
 Description: Specify Communications Timeouts
 Command Format: *Tt1.t2.t3.t4.t5

This command sets the length of various communication timeout periods. The command works with the current transaction. Once the terminal reaches the idle state, the values return to their default conditions. The parameter "t1" is the carrier detect timeout period; this timeout period begins when the terminal finishes dialling and ends when the terminal detects carrier tone. The default is 25 seconds, but a duration of less than 25 seconds can be specified.

Refer to the *T command in this Programmer's Manual for a description of the remaining parameters.

The following TRANZ 330 memory locations and their associated contents can invalidate BABT approval if set to improper values.

Terminal Parameters

Memory Location 000
Download Phone Number

This parameter is the phone number the terminal dials to connect to the host computer. The download phone number may contain the digits 0 thru 9, the characters * and # (when tone dialling is used) and a dash (-) as a two-second pause. Note that multiple sequential dashes are treated as a single delay. The delay is intended to allow a PABX sufficient time to return secondary proceed indication (second dial tone).

Important: This information applies to all other memory locations requiring telephone numbers. The apparatus user must check that all stored network addresses are correctly programmed.

Memory Location 010 Dial Type Flag

This parameter indicates the type of dialling the TRANZ 330 terminal uses. The following are valid:

Entry	Description
0	Tone Dial
1	Pulse Dial

Memory Location 011
Dial Speed Flag

This location must contain the following:
9, 20, 6, 15, 150

Any alteration to the above invalidates BABT approval.

Memory Location 015	This memory location sets the delay between incoming phone rings and execution of location 038 (auto answer string).
Auto Answer Delay	
Memory Location 038	This location enables the TRANZ 330 terminal to respond to an incoming telephone ring and communicate with another dial-up device.
Auto Answer Control String	This memory location is usually empty and needs to be programmed for the auto answer control string to support communication between the TRANZ 330 and the remote dial-up device.
Memory Location 958	This memory location must be set to 1. Any alteration from this setting will invalidate BABT approval.
Bell/CCITT Mode	
Memory Location 966	This memory location must be set to 0 or 1. Any alteration from either of these settings will invalidate BABT approval.
Auto Answer Processing	

BABT Certification Supplement

1. Introduction

TCL — the Terminal Control Language developed by VeriFone — is a powerful programming language that controls the execution of operations for both dial and polled transaction terminals. These compact, electronic TCL terminals include the PNC 330, PNC 340, ZON Jr XL, XL 300, TRANZ 330, TRANZ 340, TRANZ 380, TRANZ 420, and ZON 530, and are capable of gathering and transferring information at high speed. They are ideal for many diverse applications including point-of-sale (POS) transactions, electronic payment and transfer authorization, time and attendance tracking, order entry, inventory and process tracking and other transaction processing. This manual reflects the use of TCL for the PNC 330, PNC 340, ZON Jr XL, XL 300, TRANZ 330, TRANZ 340 and TRANZ 380. Refer to the individual programming manuals for TCL use with the TRANZ 420 and ZON 530.

Both dial and polled TCL terminals feature state-of-the-art hardware components, including the Zilog Z-80A CPU, an ABA track 2 or track 1 cardreader for reading magnetic stripe data from credit cards, and a calendar clock chip for time-stamping receipts and reports, and an 8-pin DIN (RS-232) port for printer support. The TRANZ 380 features a Z-180 CPU and integrated ATA and IABA cardreader for reading both Track 1 and Track 2 magnetic stripes, with Track 3 as an option. TRANZ 330, 340 and 380 terminals also have a 6-pin DIN port for Bar Code Wand or PIN (personal identification number) Pad operation. (Note: TRANZ 330 3.60 does not support the Bar Code Wand.)



Figure 1-1. TCL Terminal

TCL Advantages

TCL simplifies and expedites the process of programming transaction terminals. This flexible programming language comprises commands that can be linked together to create control strings for implementing or customizing an operation. With TCL you can write custom prompts or change the sequence in which prompts are displayed in the standard application. Or you can develop a totally new program for any application requiring the ability to collect, process, store and transfer data.

For example, you can write control strings to allow the terminal to operate in an environment other than POS, such as a security or inventory control environment. If other devices, such as a printer, are used with the terminal, the custom application can precisely determine the procedures and formats for entering and printing information with these devices.

Dial Terminals

The PNC 330, XL, TRANZ 330, and TRANZ 380 are TCL dial terminals with internal modems for accessing hosts and converting electronic data into tones via the public telephone lines. Modems available on the different TCL terminals include: XL — 300 baud with an optional 300 baud CCITT modem; TRANZ 330/380 — 300 or 1200 baud with an optional 300 or 1200 baud CCITT modem for international telecommunication. The TRANZ 330/380 dial terminals support auto answer which allows host computers to dial the terminal.

Polled Terminals

PNC 340, TRANZ 330 (202) and TRANZ 340 are TCL polled terminals — which are continually polled, or asked by a host for a transaction — and do not access the public telephone system. TRANZ 330 (202) has a Bell 202 modem for lease line operation. PNC 340 and TRANZ 340 has an RS-485 interface for operation on a LAN (local area network). Polled terminals have the capability of performing off-line transactions when not connected to a communication line; the terminal's local function keys allow off-line transactions.

Operating System and TCL Interpreter

Complementing each terminal's hardware is the sophisticated proprietary firmware developed by VeriFone. This firmware includes the operating system and TCL interpreter that control the execution of terminal operations, and the standard application program which is optimized for financial transaction processing.

The operating system provides a framework for application operations. Functions such as diagnostics, default communication protocol and key definitions are controlled by the operating system. There are 16 operations that are controlled by the application program and initiated from the terminal's idle state. These 16 customizable operations include nine host transactions (operations requiring communications with a host computer) and seven local functions (operations that do not usually require communications with a host computer; also called local transactions).

Operating System Revisions

The operating systems of VeriFone's TCL terminals are revised on occasion, resulting in new firmware releases. This manual addresses changes and features incorporated into the firmware version IDs listed below (unless otherwise noted). Note that this manual reflects USA firmware revisions. Differences in the international variations of the firmware may not be addressed in this manual.

VeriFone TCL-based Terminal		Firmware Version ID
ZON Jr XL		XE2AU310
XL 300		LE2AU125
TRANZ 330	Track 1	3F1EV360
	Track 2	3F2EV360
TRANZ 340	Track 1	4E1FN280
	Track 2	4E2FN280
ZON 5xx	Track 2	5E2DU360
PNC 330	Track 1	7E1EU360
	Track 2	7E2EU360

VeriFone TCL-based Terminal	Firmware Version ID
TRANZ 380 Dual track (standard keypad)	9EAEU123
TRANZ 380 Dual track (calculator style keypad)	UEAEU124

Standard Application Program

VeriFone ships all TCL terminals with a standard application program that allows you to select from 16 different POS transaction types. These transaction types follow either the VISA first or second generation protocol formats and have different prompting and security requirements to fit generic credit card authorizations or check guarantee applications. Any one of these 16 transaction types can be assigned to any of the nine host transaction keys.

Note: On TRANZ 330 versions 3.0 or greater and TRANZ 380, the terminal's default application allows you to select from four POS transaction types.

The standard application resides in firmware and cannot be modified. However, should you desire, you can write control strings to override the commands and customize your application to meet your company's specialized needs.

2. Terminal Basics

Operating System Basics

The operating system functions as the terminal's brain: it resides in firmware, oversees the execution of terminal operations, recognizes card reads and key presses and executes the appropriate operation. The operating system also manages the use of memory, routes data to and from peripheral devices, implements security functions and displays clock data. It interprets TCL commands contained in control strings, then causes the terminal to execute the command.

During different stages of operation, the operating system executes routines which check the terminal's memory (to ensure the application is okay) and checks for any input (via card reader or keypad). The following sections explain the routines automatically performed by the operating system.

Power Up Routine

Upon receiving power, the operating system performs an EPROM checksum and RAM test to ensure the terminal's memory and application program are okay. If memory location 030/0030* is empty, the operating system causes the terminal to display the date and time; if location 030/0030 is not empty, the terminal will display the "idle" prompt stored there.

Dial Terminal

The TCL dial terminal — PNC 330, XL and TRANZ 330/380 — at this point initializes RAM, resets the variables, post-dial, and multi-trans flags and enters the "IDLE" state.

Polled Terminal

The PNC 340, TRANZ 340 and TRANZ 330 (202) terminals perform the same upon displaying the "idle prompt". The terminal will initialize RAM and reset the variable and multi-trans flags before entering the idle state.

* 4-digit memory locations represent TRANZ 380 terminals.

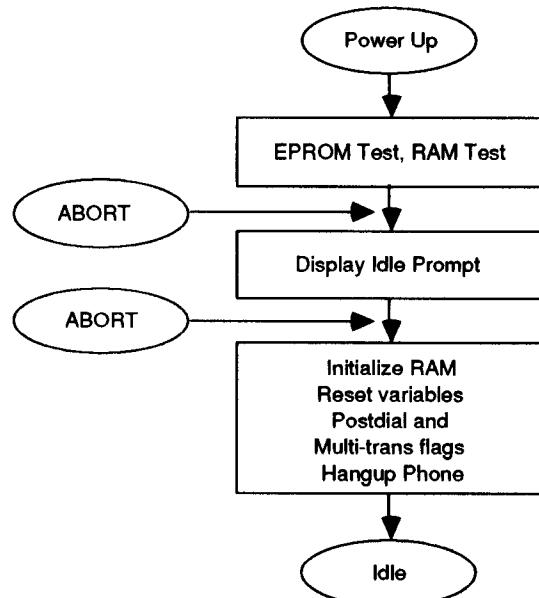


Figure 2-1. Dial Terminal Power Up Routine

PNC 340/TRANZ 340	<p>The PNC 340 and TRANZ 340, upon powering up, perform the following steps to check for a valid poll ID and baud rate code before displaying the idle prompt:</p> <ol style="list-style-type: none">1. If the poll ID (location 020) is empty, the terminal prompts the user to enter the valid ID number (between 1-96) and proceeds to check and prompt the user to enter the valid baud rate code.2. The PNC 340 or TRANZ 340 monitors the LAN for 10 seconds to see if there is another terminal responding to its poll ID. If the terminal does not find a terminal with the same poll ID within ten seconds, the monitoring TRANZ 340 assumes that there is no duplicate and continues.3. If there is a duplicate, the monitoring TRANZ 340 terminal displays "DUPLICATE POLL ID" for two seconds then prompts the user for a new poll address and monitors the LAN until no duplicate poll ID is found.4. The terminal then resets the LAN protocol, and sends reset messages to the Controller before displaying the idle prompt.
TRANZ 330 (202)	<p>The TRANZ 330 (202) performs these steps before displaying the idle prompt:</p> <ol style="list-style-type: none">1. If the terminal is not being polled by a host, it displays "NO POLLS RCVD".2. Upon powering up, the terminal checks for a valid poll ID in memory location 020. If it is empty or if the poll ID is out of range, the terminal will display "INVALID POLL ID". (A valid range depends on the protocol being used by the EPROM.)3. Once a valid poll is found, the terminal continues with power up and displays the date and time or the idle string found in location 030.
The Idle State	<p>From the idle state the terminal senses any card read, key press, or bar code read for the TRANZ 330 version 2.1 and greater or the TRANZ 380, and executes the operation associated with that data entry. An operation can be either a transaction (an operation requiring communications with a host computer) or local function (an operation that does not require communications with a host computer).</p> <p>As illustrated in Figure 2-2, the "Idle State Routine," from the idle prompt the operating system can execute:</p> <ul style="list-style-type: none">• A specific key press transaction, described in greater detail in Figure 2-3, "Key Press Routine."• A cardreader transaction. When a card is slid through the terminal's cardreader, the terminal uses the host data associated with key [1], and performs the transaction as if key [1] had been pressed. This type of transaction applies to TRANZ 330 versions less than 2.1, and the XL.

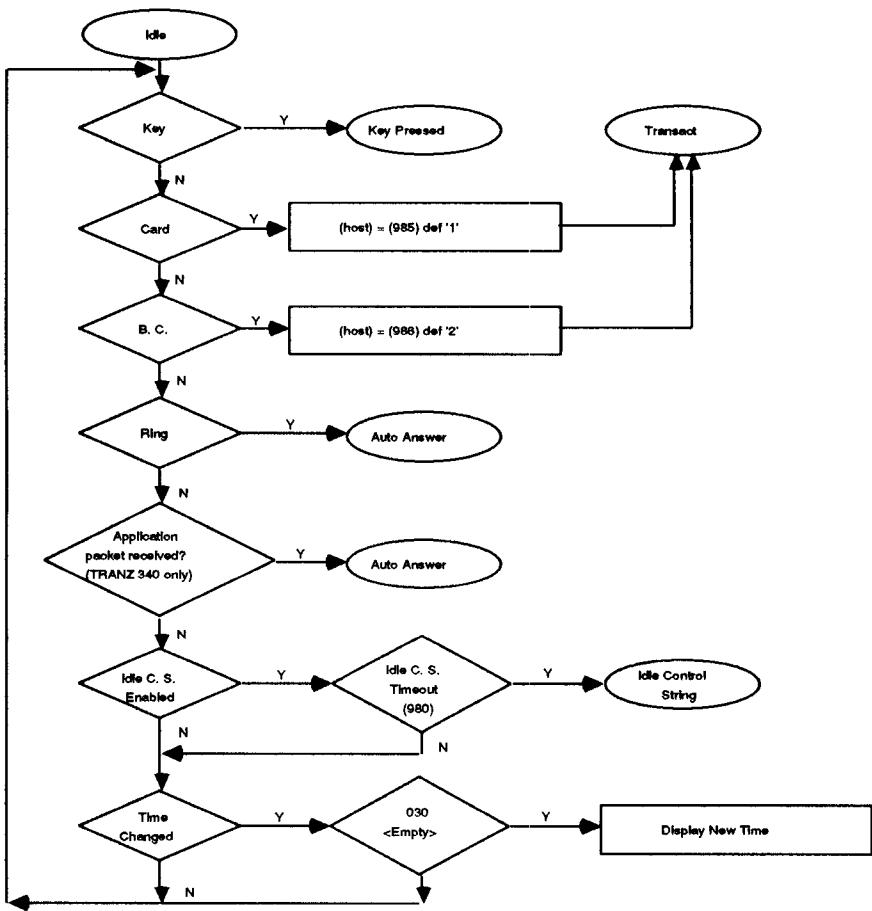


Figure 2-2. Idle State Routine

- With TRANZ 330 version 2.1 or greater, and TRANZ 380, the terminal checks memory location 985/0985 for the programmed host number for card-initiated transactions. If the first character is between 1-9, the terminal goes to that particular host (e.g., "3" goes to host 3). If a value is not programmed in location 985/0985, or if the terminal detects an alpha character, the terminal will default to 1.
- A bar code-initiated transaction — available on TRANZ 330 versions 2.1 through 3.40 and on TRANZ 380. The terminal checks memory location 986/0986 for the programmed host number for bar code transactions. If the first character is between 1-9, the terminal goes to that particular host (e.g., "3" goes to host 3). If a value is not programmed in the memory location, or if the terminal detects an alpha character, the terminal will default to 2.
- The auto answer function. See Figure 2-4, "Dial Terminal Auto Answer (for TRANZ 330 versions prior to 2.1)", and Figures 2-6 and 2-7 "TRANZ 330 Auto Answer Routine (for firmware 2.1 or greater) and TRANZ 380. If the terminal receives an incoming ring, the terminal goes to the auto answer function. This is only supported in TRANZ 330/380 versions.

- For the PNC 340 or TRANZ 340, which does not receive an incoming ring, the operating system checks whether an application packet has been received. If it has, the terminal goes to auto answer. If not, the terminal proceeds to "idle control string enabled?" (See Figure 2-5, "TRANZ 340 Auto Answer Routine.") The TRANZ 330 (202) has no auto answer and proceeds to the idle control string.
- The idle loop control string. (See Figure 2-8, "Idle Loop Control String.") If the idle control string is enabled, the terminal will timeout, set in memory location 980/0980 then execute the idle loop control string.
- When no keys are pressed and memory location 030/0030 is empty, the terminal continues to update the time display.

Key Press From the idle state the terminal will execute the operation associated with the key press. Figure 2-3, "Key Press Routine" illustrates the following key press operations:

- Pressing the [*] or [#] key causes the terminal to scroll the displayed message left or right, respectively. If the displayed message does not exceed 16 characters, the terminal leaves the display as is.
- Pressing one of the keys numbered 1 through 9 will initiate a transaction. When one of these keys is pressed, the terminal uses the host data associated with the pressed key to format data packets, dial the host and execute the transaction. Refer to "Transaction Routine" page 2-15.
- Pressing the [0] key initiates the "AUTODIAL" function. The terminal will wait until the memory-dial location is entered, then retrieves and dials the selected telephone number.
- Pressing the [BACKSPACE] key causes the terminal to post dial (wait until all transaction data is entered before dialing) the telephone number of the host associated with the next pressed key. For example, if you press [BACKSPACE] then [1], the terminal will post dial the host telephone number associated with key [1]. This operation overrides the pre-dial instruction in the control string.
- When the multiple transaction feature is enabled (multi-trans flag in location 007/0007 set to a value greater than 0) and the [ALPHA] key is pressed, the terminal will remain on line and perform multiple transactions with the host associated with the next key press. For example, if you press [ALPHA] then press [5], the terminal will dial the host associated with key [5] and remain on-line, performing multiple transactions with that host until the multi-trans timeout period expires or the [CLEAR] key is pressed.
- When the [FUNC] key is pressed, the terminal enters the routine illustrated in Figure 2-10, "Function Routine."
- Pressing [CLEAR] causes the terminal to abort the execution of TCL and return to the idle state.

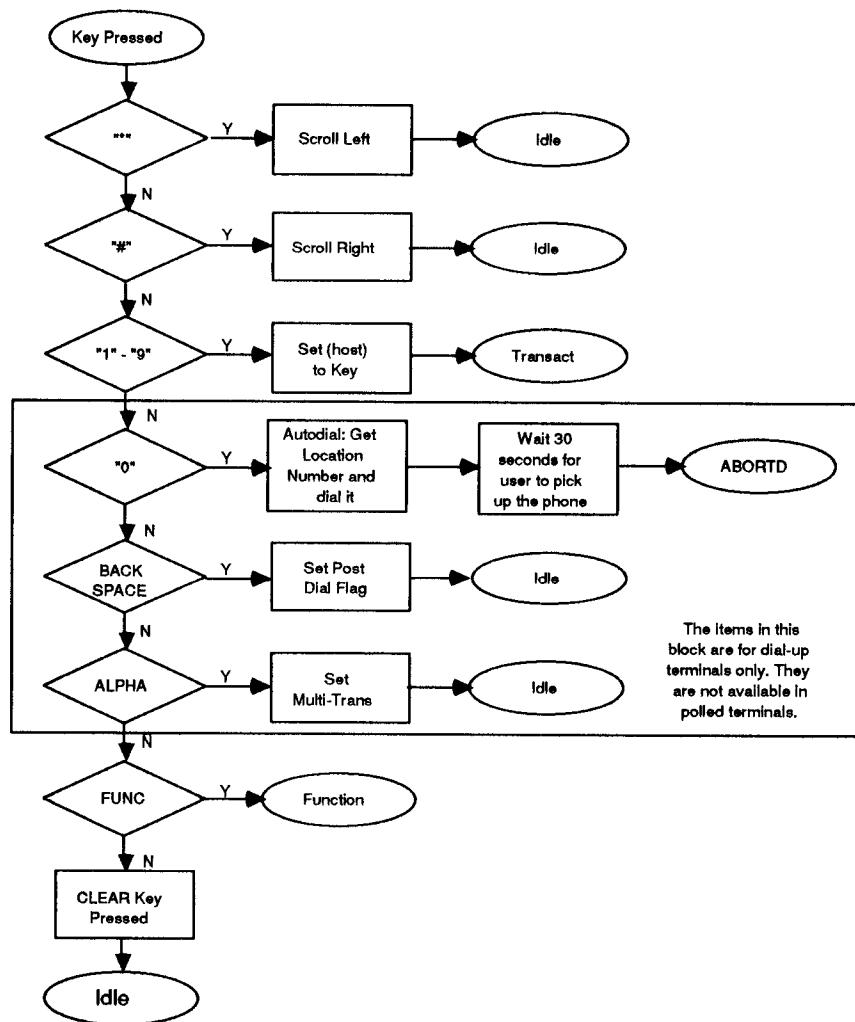


Figure 2-3. Key Press Routine

Polled Terminals

Polled terminals will execute the following key press operations as described above:

- scroll left (*) or right (#),
- initiate transaction (TRANZ 330 202 can initiate only if being properly polled by the host),
- perform function and clear routines.

The PNC 340, TRANZ 340, and 330 (202) terminals ignore the [0], [BACKSPACE] and [ALPHA] keys.

Auto Answer Function

When the terminal senses an incoming ring while in the idle state, the operating system executes its auto answer feature, as described in Figures 2-4 through 2-7.

Note: The following description and the flow chart illustrated in Figure 2-4 applies to TRANZ 330 versions prior to 2.1. See Pages 2-9 through 2-11 for a description and flow charts which apply to PNC 330 versions 3.5 and greater, TRANZ 330 versions 2.1 or greater and TRANZ 380. The polled terminal auto answer function flow chart can be found on page 2-8.

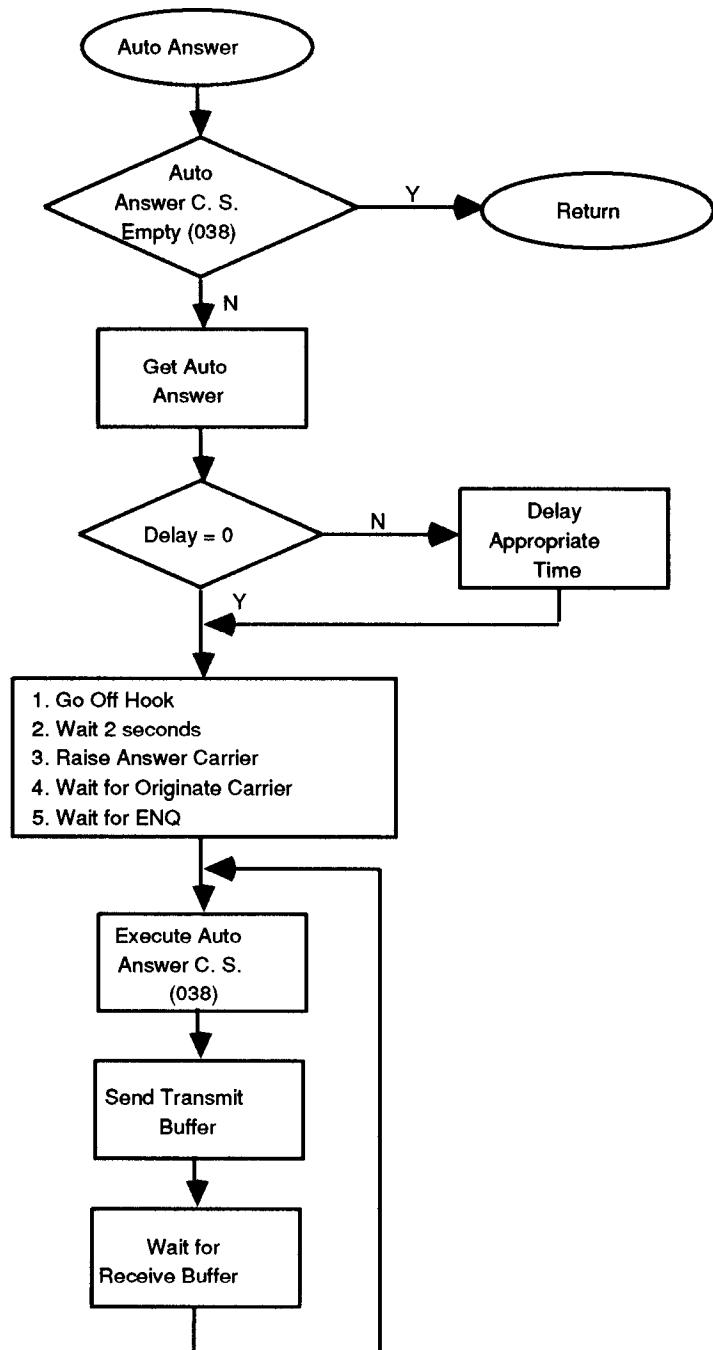
TRANZ 330 Versions Prior to 2.1

1. The terminal checks if there is a control string to execute the auto answer feature. If the control string is empty, it returns to the idle state.
2. If the auto answer control string is enabled, the terminal gets the number of seconds for the answer delay that is set in location 015. If a standard telephone is connected to the same line, this allows the user to answer the phone for voice communication before the terminal goes off hook.

Note: Verify your auto answer delay is not mismatched with the timing of the ring established by your telephone company.

3. If the delay has been set, the terminal waits the appropriate time; if the delay has not been set, the terminal proceeds to go off hook to answer the phone and waits the two-second billing delay required by the phone company. Following the two-second wait, the terminal raises the answer carrier, then waits for the originate carrier and for the host computer to send the ENQ that begins the communication process.
4. The operating system executes the commands in the auto answer control string (038) and the terminal sends its transmit buffer.
5. The terminal waits for response and loops back to execute the control string.

*Note: To exit the auto answer process, the user must execute the ABORT *K command, or the terminal will automatically abort after 20 seconds of inactivity or a communication error.*



*Figure 2-4. Dial Terminal Auto Answer
(for TRANZ 330 versions prior to 2.1)*

Polled Terminals

The TRANZ 330 (202) terminal does not perform the auto answer function; the PNC 340 and TRANZ 340 do.

Although the PNC 340/TRANZ 340 terminal does not have a modem, it is continuously polled by a controller and performs the auto answer routine whenever an application packet is received at the idle state. See Figure 2-5.

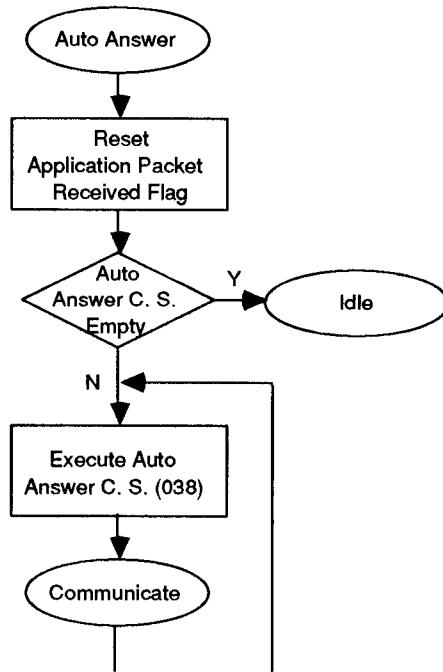


Figure 2-5. TRANZ 340 Auto Answer Routine

1. Upon receipt of an application packet, the PNC 340/TRANZ 340 resets the application packet received flag so that the application packet will not be processed more than once.
2. The terminal then checks if the auto answer control string (location 038/0038) is empty. If it is, the terminal returns to the idle prompt.
3. If it is not empty, the terminal executes the auto answer control string (memory location 038/0038).
4. The terminal then executes the communicate routine which sends the message in the transmit buffer to the controller and waits for a response from the receive buffer.
5. Steps 3 and 4 are repeated (looped) until the *K command is executed to cause an abort.

**PNC 330/TRANZ 330
2.1 or Greater
and TRANZ 380**

The following procedure is the auto answer function for PNC 330 and TRANZ 330 versions 2.1 or greater, and TRANZ 380. See page 2-6 for versions prior to 2.1 and the auto answer function for polled terminals.

1. The terminal checks to see if the auto answer control string (memory location 038/0038) is empty. If it is empty, the terminal returns and proceeds to the idle loop control string.
2. If the auto answer control string is enabled, the terminal gets the appropriate delay set in location 015/0015.
3. The terminal sets the modem speed (baud rate) as indicated in memory location 965/0965. For TRANZ 330 version 3.0 or greater and TRANZ 380, it sets the BELL/CCITT mode found in memory location 958/0958 for international and industrial versions only.
4. The terminal goes off hook to answer the phone, waits a required two seconds and checks if memory location 966/0966, Auto Answering Process, is set to "2". If it is, the terminal goes off hook, waits two seconds and executes the auto answer control string. The terminal proceeds to step 7.
5. However, if location 966/0966, which dictates auto answering, does not equal 2, the terminal raises the answer tone.
6. On TRANZ 330 version 3.0 or greater and TRANZ 380, the terminal then checks if BELL is selected. If it is, the terminal proceeds to step 7. If it isn't, the terminal waits 3.3 seconds, turns off the answer tone, waits 75 ms, then raises the unscrambled answer carrier.
7. The terminal then waits 30 seconds for originate carrier and displays "CONNECTED".
8. On TRANZ 330 version 3.0 or greater and TRANZ 380, the terminal then checks for 1200 baud. If not set to 1200 baud, the terminal proceeds to step 9. If set to 1200 baud, the terminal scrambles the carrier.
9. The terminal checks if memory location 966/0966= 1. If it does not, the terminal waits 10 seconds for the host to send the ENQ. If 966/0966 does equal 1, the terminal goes off hook, waits two seconds and raises the answer carrier.
10. The terminal executes the command in the Auto Answer Control String (038/0038), sends the data in the transmit buffer to the calling computer, waits for a response and loops back to execute the control string.

*Note: To exit the auto answer process, execute ABORT (*K) command. Or, depending on the timeout value set in location 967/0967, Auto Answer Packet Inactivity Timeout, the terminal can be set to automatically abort after a specified period of inactivity.*

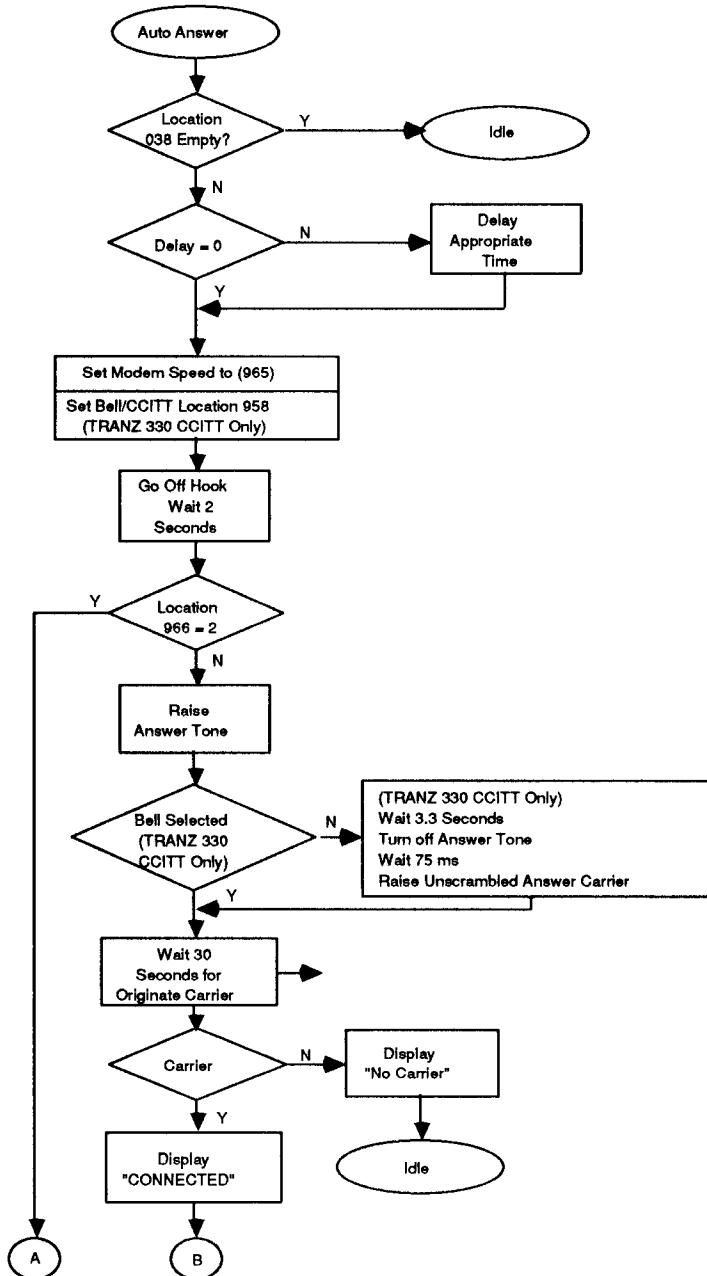


Figure 2-6. PNC 330, TRANZ 330 Auto Answer Routine (for firmware 2.1 or greater) and TRANZ 380, Part 1

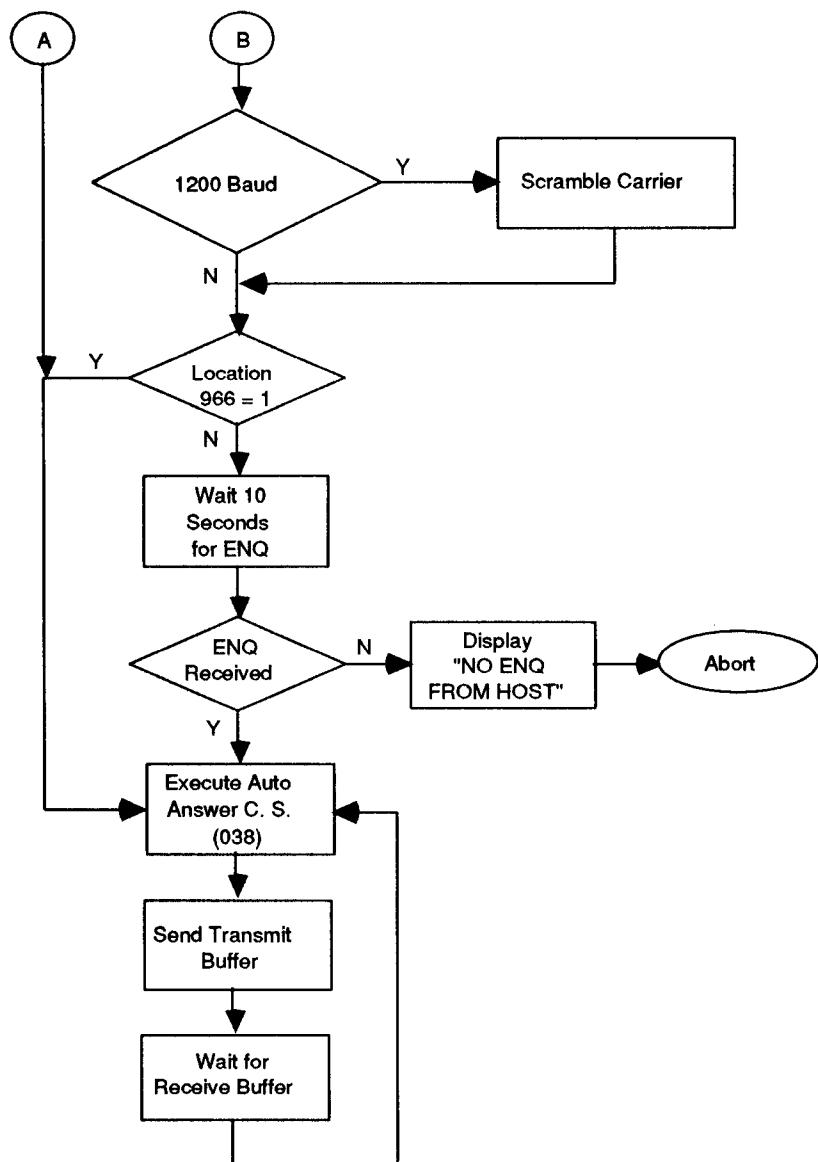


Figure 2-7. PNC 330, TRANZ 330 Auto Answer Routine (for firmware 2.1 or greater), and TRANZ 380, Part 2

Idle Loop Control String

The Idle Loop Control String can be used for the terminal's unattended operations. For example, if the terminal is left inactive for a set number of seconds, it can be programmed to check the time, beep or upload a batch at a preset time. As shown in Figure 2-8, "Idle Loop Control String":

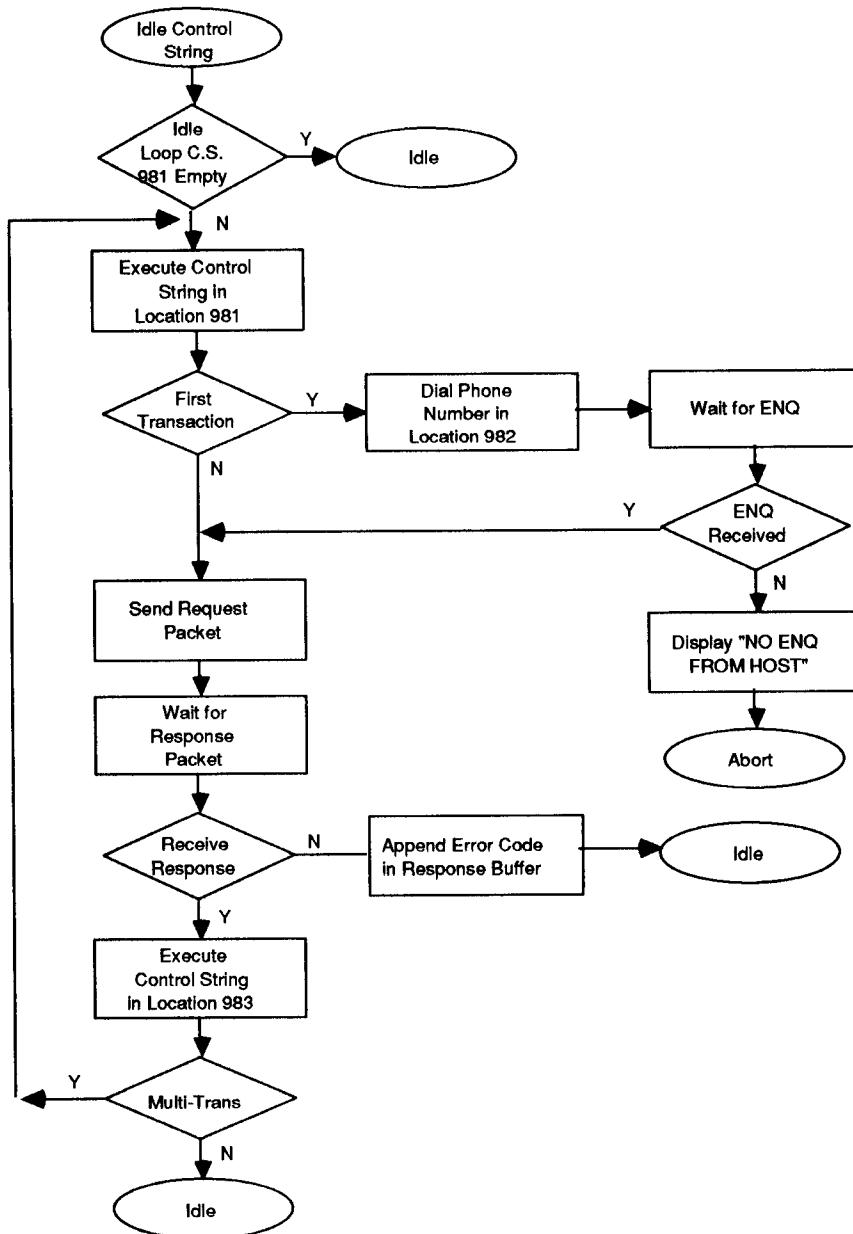


Figure 2-8. Idle Loop Control String

1. The terminal checks if the idle loop control string is empty. If it is empty, the terminal continues to execute the idle state. Otherwise, the operating system executes the control string in memory location 981/0981.
2. If it is the first of a multiple transaction, the terminal dials the phone number in location 982/0982 and waits for the ENQ. If it is not the first transaction, the terminal skips to the next step. This step is skipped by the TRANZ 340/330 (202).
3. The terminal sends the request packet — the data in the transmit buffer — to the host computer and waits for a response. Upon receipt, the terminal executes the control string in location 983/0983 and loops back to control string 981/0981 if in multi-trans mode.

Note: To exit the idle loop control string, you must execute the ABORT command. Or, depending on the timeout value set in location 984/0984, the terminal can be set to automatically abort after a specified period of inactivity.

The PNC 330 or PNC 340 terminal, when set in PNC or PNC with Printer mode, will not support the idle loop control string.

Transaction Routine

From the idle state, pressing one of the keys numbered 1 through 9 causes the terminal to perform the transaction routine. The terminal identifies the host associated with the pressed key, and uses that host's data during the transaction unless otherwise instructed by the control string. For example, pressing key [4] from the idle state would cause the terminal to use the host information stored in memory locations 400/0400 to 412/0412. Your terminal has two default protocols commonly referred to by the financial industry as VISA first and second generation protocols. These two protocols are described in more detail in Appendix B. Remember, you are not limited to these two protocols. The terminal control language will allow you to use any desired protocol within the framework of VISA first and second generations, and make modifications to the extent allowed by commands *P, *R and *T. Refer to Figures 2-9 and 2-10, "Transaction Routine, Parts 1 and 2" when reading the following description.

1. When a key press begins a transaction, the operating system initializes the transmit buffer with the STX character, where the STX character is not initialized in polled terminals, and the merchant identification (found in location x04/0x04; x = host). If x04/0x04 is empty, the terminal displays "NO MERCHANT ID" and aborts the transaction.
 - When executing a first generation transaction, the terminal appends a field separator (FS) to the buffer.
 - When executing a second generation transaction, the terminal appends the serial number (001), index code, message sequence number (005) and the message status code to the buffer.

2. The operating system executes the commands in the transaction control string (memory location x07/0x07). If location x07/0x07 is empty, the terminal executes a sequence of commands indicated by the message format flag (set in location x05/0x05). After executing the control string, the terminal prepares the data in the transmit buffer for communication to the host.
 - If the terminal is performing a first generation transaction and the last character is a (FS), the (FS) is removed.
 - If the terminal is performing a second generation transaction, it converts the write control character (WCC) to the account data source, and converts the "=" sign (expiration date separator) to a unit separator.

Note: The terminal determines whether it is doing VISA first or second generation by the value stored in x05/0x05, whether or not there is a control string in x07/0x07.

The terminal then appends the termination character and LRC character to the data in the transmit buffer before executing the communicate routine. The terminal will not raise the carrier until x07/0x07 is exited and the communicate routine starts executing.

Note: TRANZ 340 does not append the termination character until running the communicate routine.

3. When performing the communicate subroutine, both the polled and dial terminals will check if there is a communication error. If there is, the terminal clears the response buffer, appends the error code and checks location 990/0990, Communication Error Control String. If there is no communication error, the terminal continues to step 4.

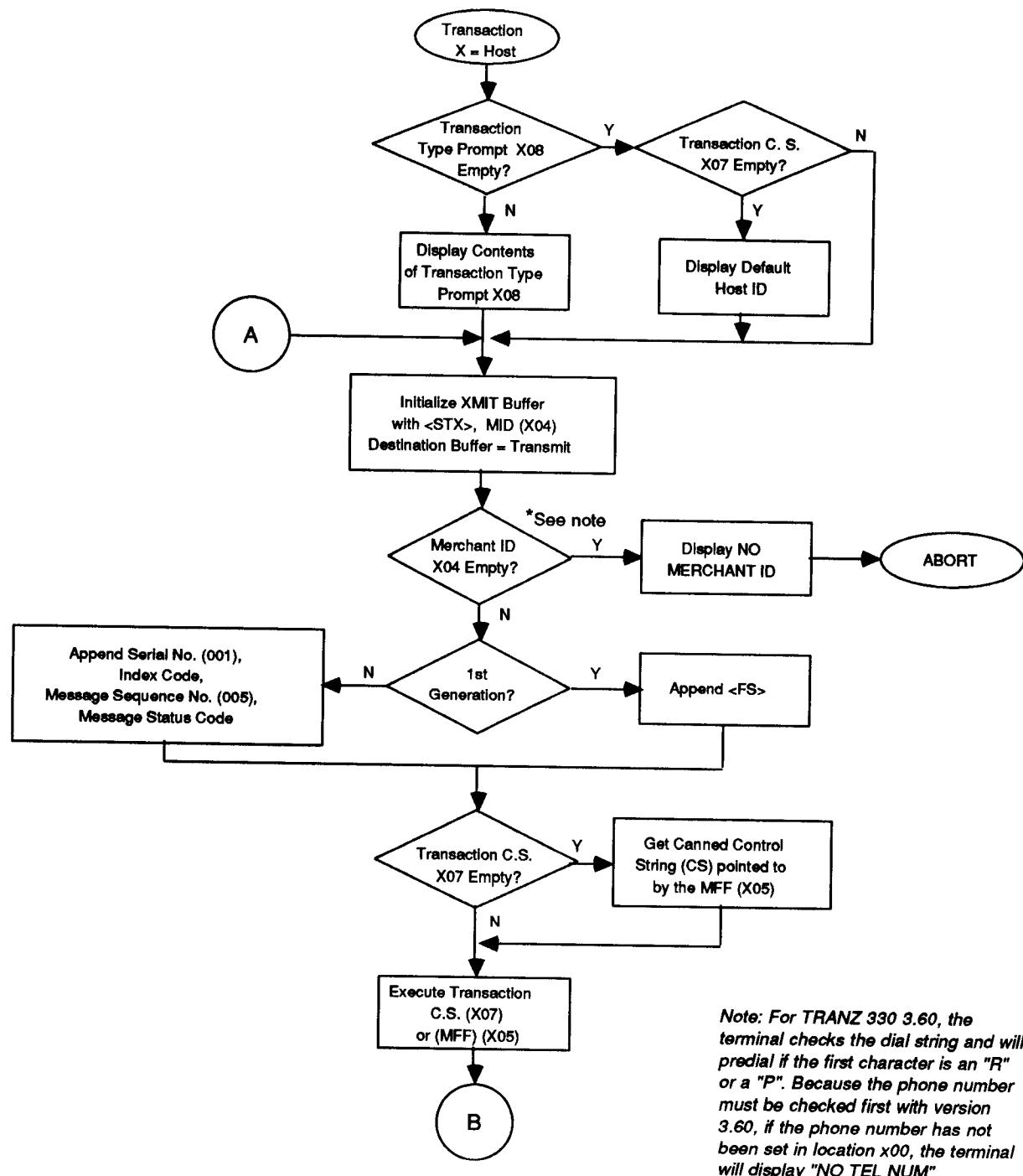


Figure 2-9. Transaction Routine, Part 1

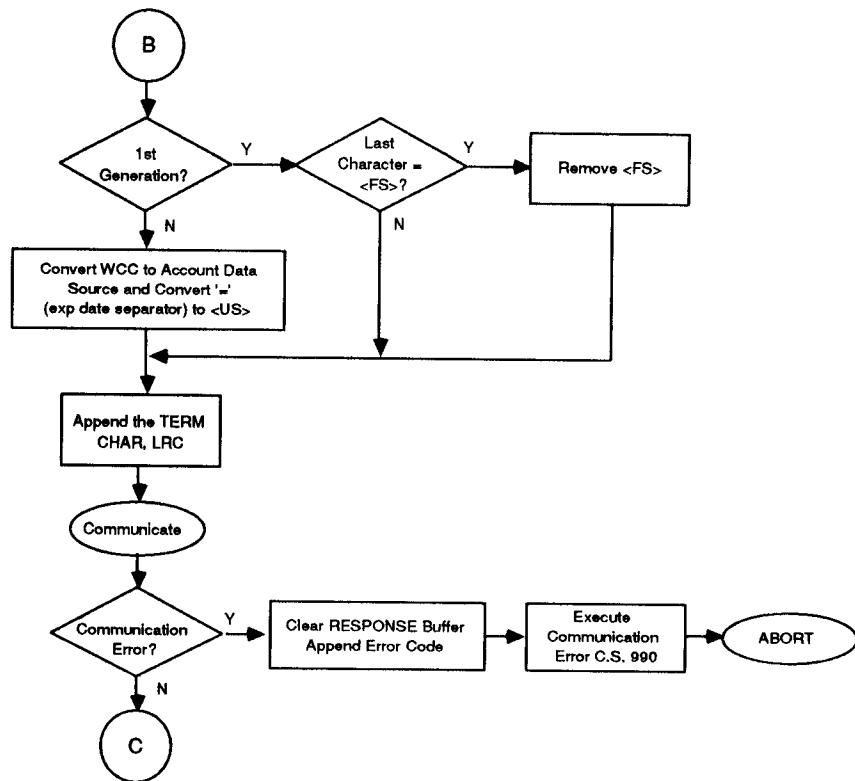


Figure 2-10. Transaction Routine, Part 2

Error Codes that may be generated during the communicate subroutine:

Dial Terminals	Code	Description
	1	Lost Carrier
	2	No ENQ
	4	Exceeded Number of Allowable Response Timeouts (no response from host)
	5	Host Sent EOT
	6	Bad RX Communication
	7	Bad TX Communication
TRANZ 340	2	Transmit or Receive Error
	9	No Response from Host
TRANZ 330 (202)	2	Transmit Error
	9	Receive Error or No Response from Host

4. Upon completing the packet transmission to the host computer, the terminal executes the commands in the Response Analysis Control String (found in memory location x10/0x10).
 - If location x10/0x10 is empty and the transaction is of the first generation* type, the terminal displays the host response message.
 - If location x10/0x10 is empty and the transaction is a second generation* type, the terminal increments the message sequence number, updates the date location, and displays the host response message. Second generation response is more complex than this. It allows for automatic dialing of the Call Center voice line depending on the host.

**transaction type determined by contents of x05/0x05*

5. The terminal will then execute the optional control string found in memory location x11, "Print Control String". If x11/0x11 is empty, the terminal goes to the next step.
6. If multi-trans mode is enabled, the terminal will return to the beginning of the transaction routine x07/0x07.
7. If multi-trans mode is not enabled, the terminal will abort the routine and return to the idle state.

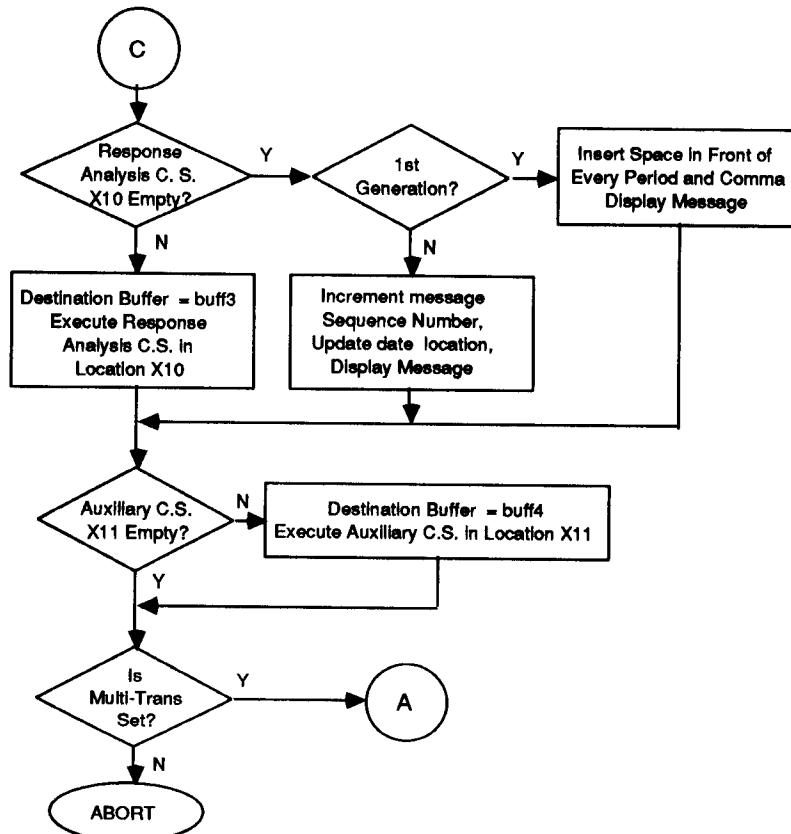


Figure 2-11. Transaction Routine Flow Chart, Part 3

Communicate Subroutine	During a standard or multi-trans transaction, the operating system executes the communicate subroutine to send and receive data from the host computer. Please refer to Figures 2-12 and 2-13, the "Dial Terminal Communicate Subroutine" to trace the following description:
Dial Terminals Only	<ol style="list-style-type: none">1. Upon entering the communicate subroutine the terminal immediately checks to see if the RS-232 port is selected (XL only). If the port is selected, the terminal waits for an enquiry (ENQ).2. When the RS-232 port is not selected (XL only), the terminal checks to see if it or its parallel phone is on hook. This happens only if the phone number has not been dialed.<ul style="list-style-type: none">• If the parallel phone is off hook, the terminal displays the "WAITING FOR LINE" message, and loops back to check the line status.• If the parallel phone is on hook, the terminal dials the host telephone number stored in memory location x00.3. After dialing the host's phone number, the terminal waits until it detects the carrier tone from the host. The terminal will then raise its carrier.4. The terminal will logon to the network if necessary, then wait for an ENQ from the host.5. Upon receiving the enquiry, the terminal sends the transmit request packet to the host.6. The terminal waits until it receives a response packet from the host, or until the response timeout expires.7. Upon receiving the response packet, the terminal sends an ACK to the host computer if the packet was received properly, then waits for the end-of-transmission (EOT) signal from the host. Otherwise, it sends a NAK and waits again for the response packet.8. When the terminal receives the EOT signal, it returns to the transaction routine. If the terminal does not receive the EOT within the EOT timeout period, but does have a valid response packet, it will return to the transaction routine as if it had received an EOT.

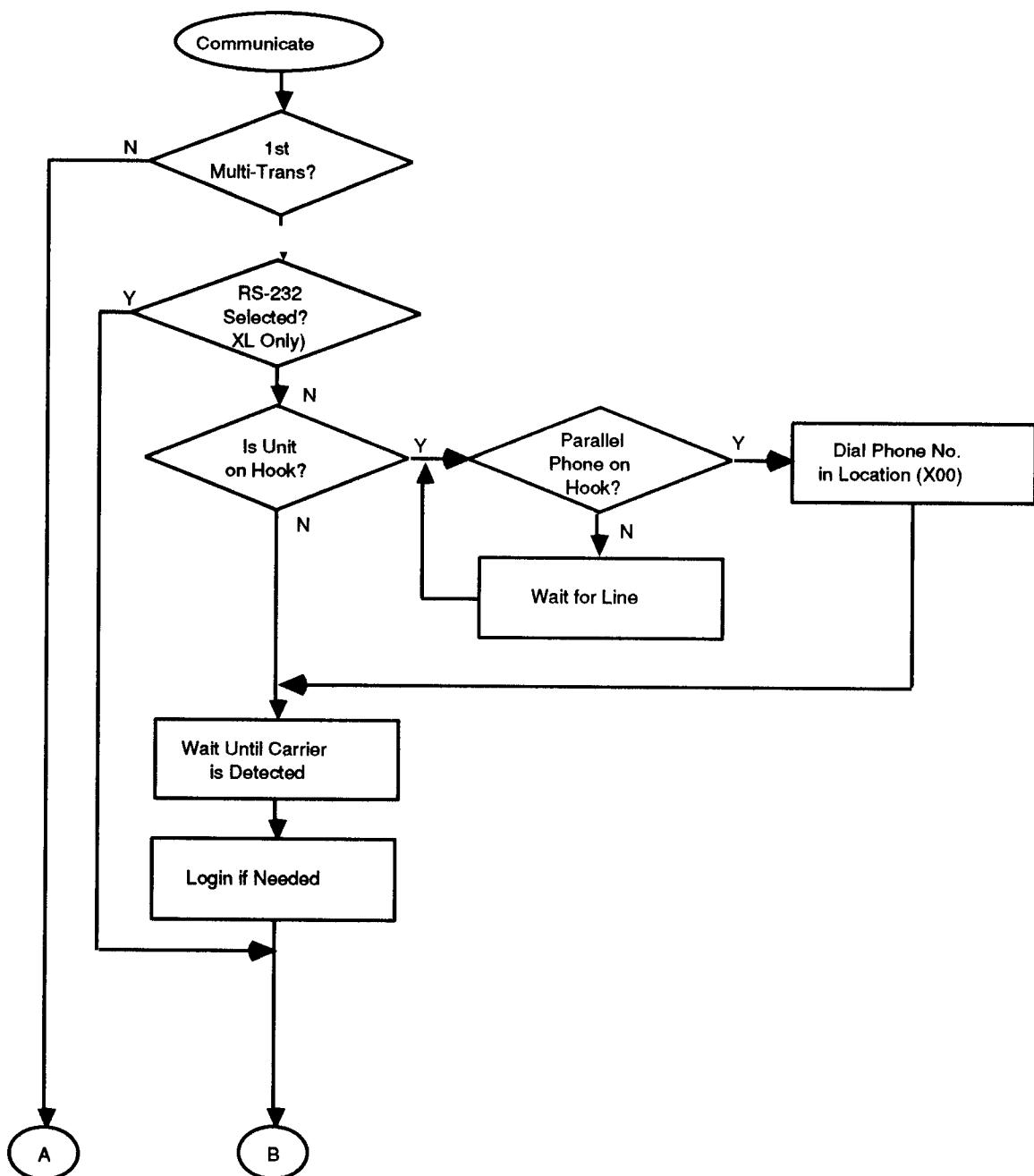


Figure 2-12. Dial Terminal Communicate Subroutine, Part 1

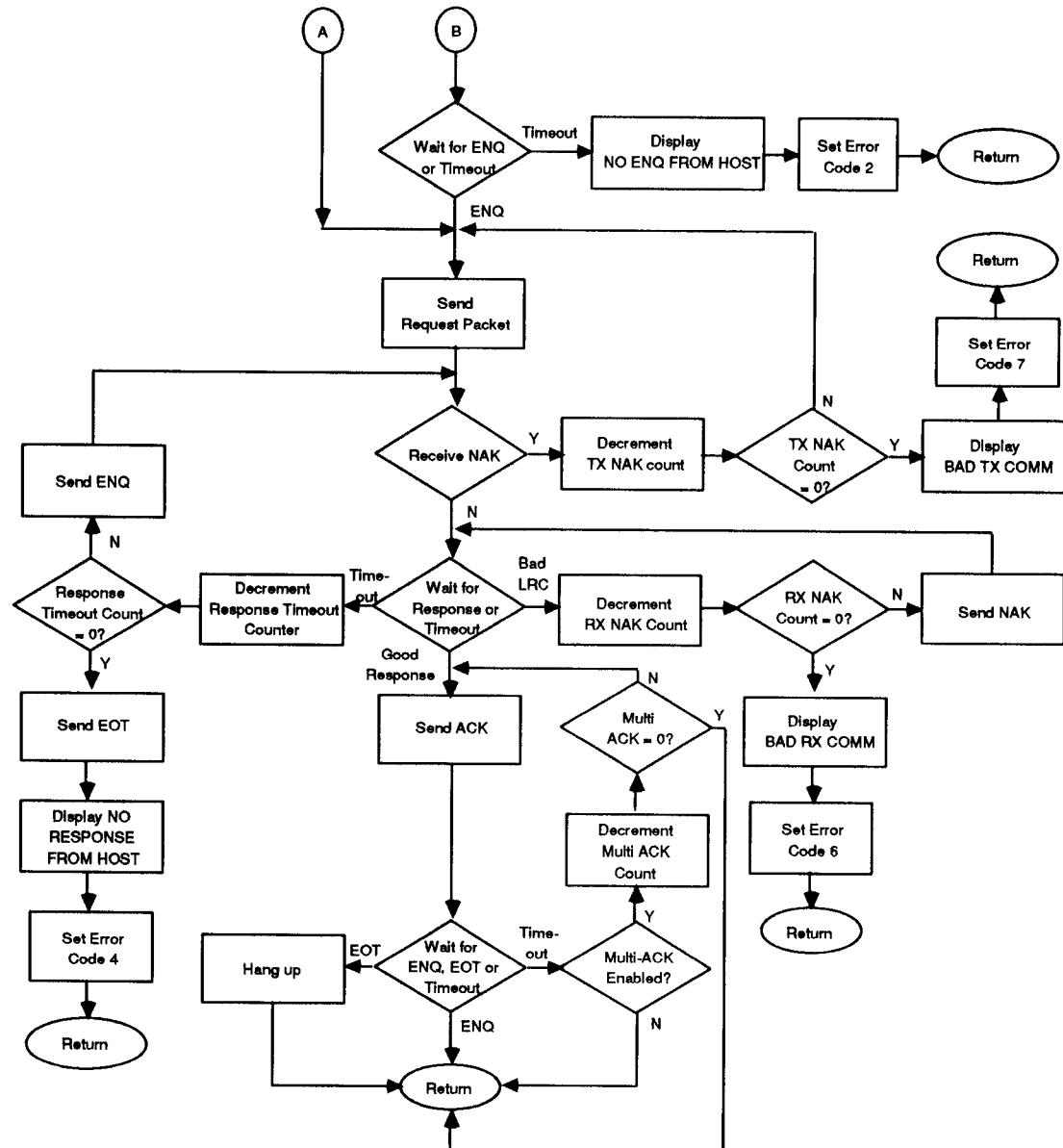


Figure 2-13. Dial Terminal Communicate Subroutine, Part 2

Polled Terminals Only

During a transaction, the polled terminals execute the communicate subroutine to send and receive data from either the LAN controller for the PNC 340/TRANZ 340 or the leased line network for the TRANZ 330 (202).

Figure 2-14, "Polled Terminal Communicate Subroutine," illustrates the communication subroutine for both polled terminals.

1. The terminal displays "PROCESSING" message. The TRANZ 330 (202) proceeds to step 2; the TRANZ 340 checks to see if the LAN controller is polling. If it isn't, the terminal displays "BAD TX COMMUN", sets the error code and returns. If the controller is polling, the terminal continues.

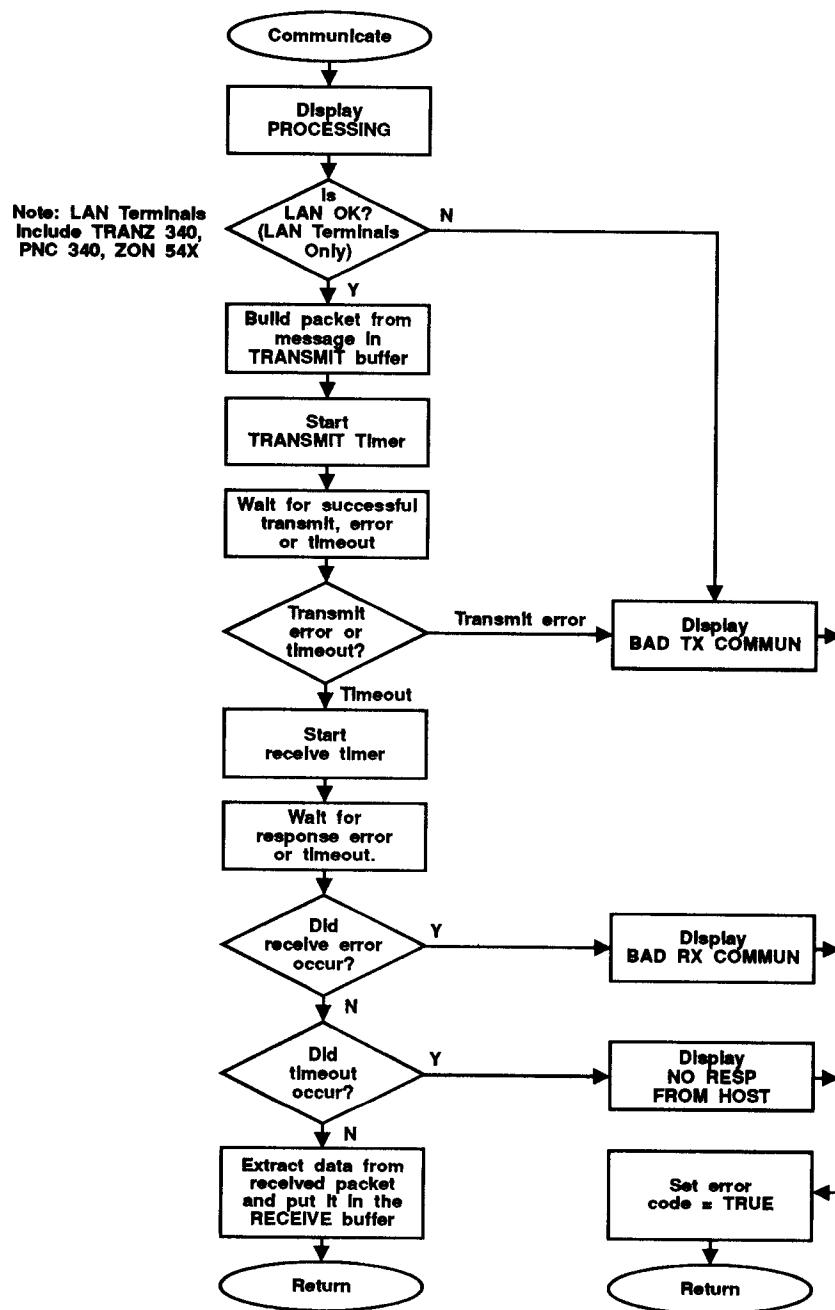


Figure 2-14. Polled Terminal Communicate Subroutine

2. The terminal builds a packet from the message found in the transmit buffer and starts the transmit timer.
3. The terminal then waits for either an error, timeout or a successful transmission.

4. If an error or timeout has occurred, the terminal displays "BAD TX COMMUN", sets the error code and returns. If not the terminal starts the receive timer and again waits for a response, error or timeout.
5. If a receive error has occurred, the terminal displays "BAD RX COMMUN", sets the error code and returns.
6. If a receive error has not occurred, the terminal checks if a timeout occurred. If it has, the terminal displays "NO RESP FRM HOST", sets the error code and returns.
7. If a timeout has not occurred, the terminal extracts data from the received packet, places the data in the receive buffer and returns.

Function Routine

Pressing the [FUNC] key from the idle state will cause the operating system to execute its function routine. As shown in Figure 2-15, "Function Routine":

- Pressing one of the keys numbered 1 through 6, or 9, causes the terminal to execute the associated function control string.
- Pressing the [7] key causes the terminal to execute the "RECALL" function. The terminal will allow you to recall and review the data stored in various memory locations.
- Pressing the [8] key causes the terminal to execute the "STORE" function. The terminal will allow you to store data in various memory locations.
- Pressing the [ALPHA] key will enable the password management routines. These management routines allow users to set their own passwords.

Note: The default password for the XL is 166831. The default PNC 330/340 and TRANZ 330/340/380 terminal password is Z66831 or [1] [ALPHA] [ALPHA] [6] [6] [8] [3] [1].

- Pressing the [*] key causes the terminal to send data during a unit-to-unit download. The terminal will serve as the sending terminal during the download.
- Pressing the [#] key prepares the terminal to receive data during a unit-to-unit download. The terminal will function as the receiving terminal during the download.
- Pressing the [0] key initiates the dial-up download routines. The terminal will wait for the user to select the download type. The user may press the [*] key to request a partial download, or press the [ENTER] key to request a full download.

Note: The PNC/TRANZ 340 will prompt for one/all or full/partial downloads.

- Pressing the [CLEAR] key causes the terminal to abort the function routine and return to the idle state.

Note: With the PNC/TRANZ 340, press the [FUNC] key twice to clear memory locations 001, 019, 020 and 021.

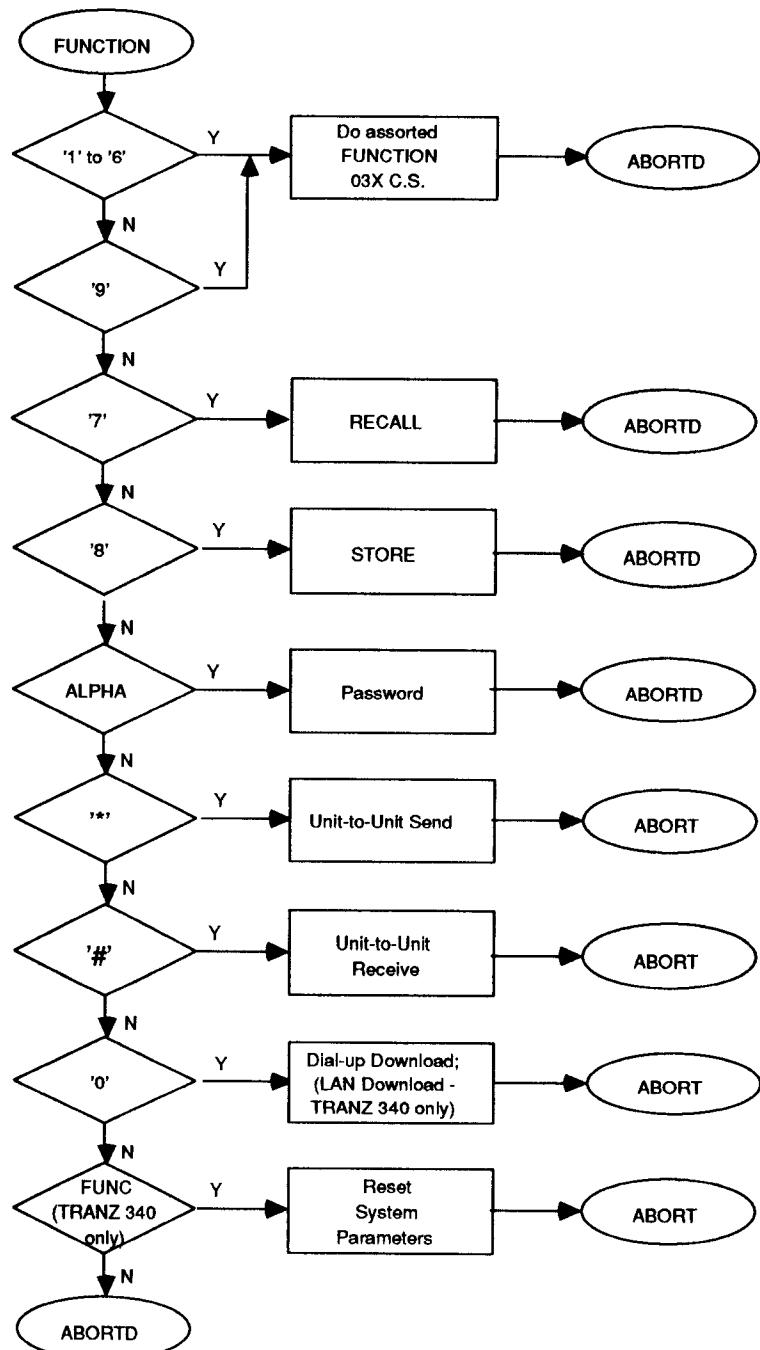


Figure 2-15. Function Routine

Abort Control String

In many TRANZ terminal applications, it is important that the current operation is not aborted—by the operator pressing the [CLEAR] key or by any other means—until any required processing has first been completed, or at least until steps have been taken to abort the operation properly.

An abort cycle is executed whenever a power-up restart occurs, the [CLEAR] key is pressed at any time, or a TCL instruction *K (Abort) is executed. An abort for any of these reasons will cause execution of the Abort Control String (ACS), if present. When an abort is executed, memory location 979/0979 (Abort Control String) is read and any TCL command in that location is executed. If memory location 979/0979 is empty, the OPSYS will abort to the idle state.

The Abort Control String is especially useful when a transaction may need to be "reversed" once it has progressed beyond a critical point, such as the storage of a transaction capture record, or the printing of a receipt.

If a *K instruction is used with the ACS itself, the OPSYS will re-execute the abort process from the beginning and will, therefore, re-execute the ACS if still present. Pressing [CLEAR] or even power cycling the terminal will not break the abort loop because these actions will also cause an abort, therefore re-executing the same Abort Control String.

To properly abort the ACS back to the idle state, the ACS must clear itself. This can be accomplished by including the following TCL instructions at the start of memory location 979/0979:

Command	Description
B.5	; Select an unused buffer
G	; Clear it, and
U979	; clear the ACS
Lxxx	; Any other processing required

Because the OPSYS loads control strings into a temporary buffer for processing, a control string which clears itself will still be executed correctly, including any links to subsequent memory locations via the L instruction.

Tip: It may be necessary to change the current contents of the ACS occasionally, depending on the context, within a transaction or function. The following TCL example shows one way of accomplishing this:

```
B.5          ; Select an unused buffer
G           ; Clear it
R'B.5GU979Lxxx' ; Append TCL instructions
U979         ; Update the ACS
; If [CLEAR] key is pressed, the following will be executed:
; B.5          ; Select buffer
; G           ; Clear it
; U979         ; Clear the ACS to prevent looping
; Lxxx         ; Link to control string in memory
; location xxx
```

Buffers

The terminal has five buffers: a transmit buffer, a receive buffer, and three work buffers. Each buffer can hold up to 250 alphanumeric and control characters, and can be used as a temporary "storage" area. Each buffer also has a code that can be selected by using the "B" command. The buffer codes and names are as follows.

Table 2-1 Buffer Codes**Code No. Buffer Name**

1	Buffer 1 TRANSMIT
2	Buffer 2 RECEIVE
3	Buffer 3
4	Buffer 4
5	Buffer 5

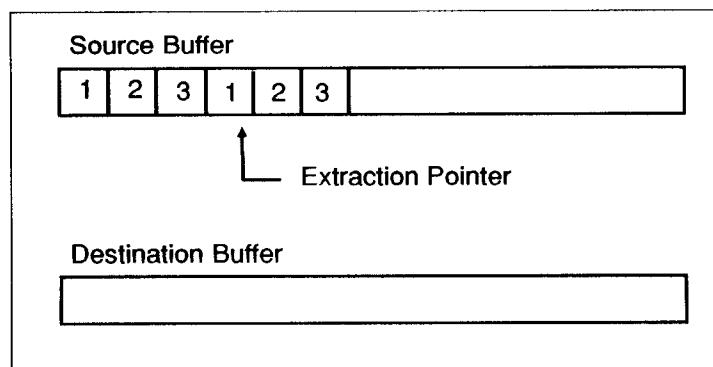
Buffers serve as your primary work space. You can use the buffers to build request packets, disassemble response packets, create data capture headers and detail records, and display the contents of other buffers.

The terminal provides two tools to view or manipulate the contents of a buffer: the source (read only) and destination (write only) buffers. These buffers are actually "windows" into which you can pull the contents of any other buffer. For example, you could view the contents of the transmit buffer by selecting it as the source buffer. Or, by selecting the transmit buffer as both the source and destination buffer, you could read and write to it using the "X" command.

For example, say buffer 5 = '123,' and you select buffer 5 as both the source and destination buffer using command B5.5. If you then use the "X" command, which copies data from the source buffer and appends it to the destination buffer, the resulting value of buffer 5 will be '123123.'

As shown in Figure 2-16, the source buffer has an "extraction pointer" which marks your location within the buffer. You can use the "O" command to move the extraction pointer, the "B" command to reset the pointer and use the "X" command to copy and pull out segments of data from the source buffer to the destination buffer.

Note: The destination pointer cannot be moved by the programmer; it always points behind the last character in the buffer.

*Figure 2-16. Destination and Source Buffer*

When planning your application, remember that transmit and receive buffers are the only buffers you can use to communicate with a host computer. You must use the transmit buffer to send data to a host computer, and use the receive buffer to receive data from the host computer. In addition to communicating with the host computer, the transmit and receive buffers, like the other three buffers, may also be used for:

- performing arithmetic calculations,
- passing data to data-capture records,
- building detail records,
- building data packets,
- sending data to the printer.

When selecting buffers, remember:

- The "B" command selects the source and destination buffers and resets the source extraction pointer.
- The "X" command copies data from the source buffer to the destination buffer.
- The "O" command moves the extraction pointer in the source buffer.
- The "G" command clears or empties the destination buffer.
- Before a buffer can send data to the printer, you must select it as the destination buffer.

Variables

The terminal uses only local variables, which are reset to a value of 0 at any type of an Abort function. Local variables serve as temporary work bytes that may have a value of 0 to 255 in the XL and TRANZ 330, versions 1.2 or less and 0-65535 in TRANZ versions 1.3 and greater. You can use these variables as counters, pointers to memory locations, ASCII code values or flags.

Note: In the XL terminal you can only point to memory locations 0 - 255 using variables.

You can specify up to ten variables for each transaction, numbering them 0 through 9. To designate a variable, you must precede the number with the pound (#) sign (#0, #1, #2, #3....#9). You can use a variable as a parameter in any command that accepts a numeric value. For example:

1. *N#2.113 ;set variable #2 to 113
.
.
.
A#2 ;append memory location pointed to by variable #2
2. *N#3.61 ;set variable 3 to 61 (ASCII code for "=")
R#3 ;append the "=" sign to the destination buffer

The TRANZ 380 supports up to 100 variables for each transaction, numbering them 00 through 99.

Note: The leading zero in variables #00 - #09 is not required (only applicable to TRANZ 380).

8-Pin DIN Connector and RS-232 Communications

The XL and TRANZ 330/340/380 terminals feature an 8-pin DIN connector for RS-232 communications or printer interface. There is a difference between the configuration of the port for the TRANZ and XL terminal; TRANZ allows two-way transfer of data at a maximum of 19,200 baud, the XL allows two-way transfer of data at 2,400 baud, one-way communication at 4800 and 9600 baud (transmit only).

Commands commonly used to control peripheral devices via the 8-pin DIN port include the "N" and "W" commands. The "N" command prints the destination buffer. The "W" command causes the terminal to wait until the printer buffer is empty before continuing execution of the control string.

The TRANZ 330/380 and XL 2.80 and higher terminals also use the "*I" command which provides character I/O of the RS-232 port.

Two-Way Communications

To enable two-way communications via the 8-pin DIN connector, use the "*R", "*I", "+R" commands. The "*R" command and "+R" (limited) on the XL and the *R, *I and +R commands on the TRANZ terminals select the RS-232 port (tells the terminal to use the RS-232 port, instead of the modem, for communications with the host) and sets the data format.

6-Pin DIN Connector For Bar Code Wand and External PIN Pad

The TRANZ 330, 340, 380 (and 5xx series) terminals also feature a 6-pin DIN connector for a bar code wand or an external PIN (personal identification number) pad.

Commands commonly used to control peripheral devices via the 6-pin DIN port include the "*H" and "*U" commands. On TRANZ 330 versions 2.1 or less, the "*H" command enables the terminal to encrypt personal identification numbers. The "*U" command enables the terminal to accept input from a bar code wand (except in TRANZ 330 versions 3.6 and higher).

Memory Considerations

The terminals use ROM (read only memory) for the terminal's operating system, standard application and fixed prompts, and RAM (random access memory) for parameter data, control strings and data capture records. As shown in Figure 2-17, the more memory used for control strings and parameter data, the less memory you will have available for data capture records.

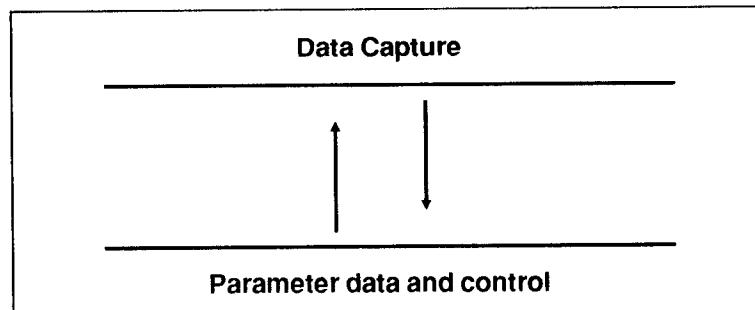


Figure 2-17. Non-Volatile Memory

Although the majority of the memory locations are available for general purpose data storage, many memory locations have dedicated functions, or special restrictions. See "Appendix A. Memory Locations" for a summary of these dedicated functions and restrictions. The following sections will help you understand how the terminal's memory is organized, and how the operating system manages the use of terminal memory.

Table 2-2 Terminal General Location Memory Size

Terminal	Version	No. Characters In General Locations
TRANZ	1.3 and lower	60
	2.0	120 (except x07, x10, x11, 03x which hold only 60 chars)
	2.1 and higher	120
XL	2.11 and lower	60
	2.40 and higher	120

TRANZ 330/340 Memory Size	The TRANZ 330/340 terminals have 32K ROM and 32K battery-backed RAM for a total of 64K memory. Of the 32K RAM, 24K is available in TRANZ 330/340 firmware versions. There are one thousand memory locations that can be used for storing parameter information (telephone numbers, access codes, merchant IDs, etc.) and TCL control strings. TRANZ 330/340 firmware less than version 2.1 supports 60 characters; later versions as well as TRANZ 380 support 120.
TRANZ 380 Memory Size	TRANZ 380 terminals support 2000 memory locations (0000-1999). There are two types of memory: Program and Batch. Program Memory holds the TCL application and may not exceed 64K; Batch Memory holds batch files and may not exceed 128K.
XL Memory Size	The XL terminal has 32K ROM and 16K RAM for a total of 48K memory. Of the 16K RAM, 11K is available in XL firmware versions. Within the 16K RAM, XL firmware version 2.51 and higher has 478 memory locations that can be used for storing parameter information (telephone numbers, access codes, merchant IDs, etc.) and TCL control strings. XL firmware less than 2.40 supports 60 characters; later versions support 120.
Power Surges While Processing	If a power surge occurs while the terminal is updating RAM, the memory may become corrupted. If this happens, the terminal will display "PROGRAMMING ERR." To recover, simultaneously press the [FUNC/ENTER] and [1] keys. This clears the terminal's memory and you must reload the application.
Dedicated Control String Locations	Each terminal transaction has up to three dedicated control string locations which the operating system sequentially processes: the transaction control string (location x07/0x07; "x" = the transaction key pressed), the response analysis control string (location x10/0x10) and an auxiliary control string (location x11/0x11). When a transaction key is pressed, control immediately passes to the transaction control string. For example, pressing the [1] key from the idle state causes the terminal to begin executing the control string stored at

memory location 107/0107. Likewise, pressing the [2] key causes the terminal to begin executing the control string at location 207/0207.

Each function also has a dedicated control string location. When you press the [FUNC] key, then one of the keys numbered 1-6, or 9, control passes to the appropriate function control string. For example, pressing the [FUNC] key then [1] key causes the terminal to begin executing the control string in location 031/0031. Likewise, pressing the [FUNC] key then [6] key causes the terminal to begin executing the control string in location 036/0036. See "Appendix A. Memory Locations" for a summary of dedicated control string locations.

Parameter Information

Parameter information includes host information (such as telephone numbers, merchant IDs, message format flags, floor limits, etc.), network logon data, and terminal specific data (such as the terminal's serial number, dial type, and key beep). As you look at the memory map in Appendix A, you will notice that certain memory locations have been dedicated to parameter information.

For example, terminal parameters include memory locations 4 through 14. Locations x00/0x00 through x12/0x12 (x = the transaction key pressed) are dedicated for host parameters.

Once your terminals are out in the field, it may be desirable to later download parameter data over the telephone line via ZONTALK 2000, the VeriFone download software. Using ZONTALK 2000, you can specify whether a data item should be downloaded to a single terminal or a group of terminals.

For example, while you would download a serial number and telephone flags to a specific terminal, you would probably want to download host telephone numbers and control strings to a group of terminals. It is important to consider these logical parameter groupings at this stage of development to minimize the overhead of maintaining a large number of terminals.

Memory Compression

To use memory efficiently the terminal compresses data stored in memory locations and in data capture. The compression algorithm translates all lower case alpha to upper case; one character byte. It also causes all numeric values to be compressed to 2 digits per byte (BCD - Binary Coded Decimal).

Data Capture and Batch Files

The term "data capture" refers to the process of capturing transaction data and storing it in the terminal's RAM for processing at a later time. When the terminal is performing "data capture," it is actually storing transaction details in detail records, which in turn, are stored in a batch file.

A batch file is a group of input data or documents (in this case, a group of detail records) which are collected together and processed as a single unit. The terminal stores batch files in RAM. As you perform transactions, the terminal adds detail records to the open batch until you close the batch or the memory becomes full.

The terminal allows you to create a batch file using the "A" command. When creating a new batch, you must create a new batch header, which is a simple heading or title identifying the batch. The header can be any

combination of characters which make it uniquely retrievable. For example, you may use the terminal type and the current date as the batch header. Remember, you cannot label two batches with the same batch header.

The terminal allows you to use only one batch at a time.

When working with batch files, remember...

XL/TRANZ Version 2.0 or Less

For all XL versions and TRANZ 330/340 versions 2.0 or less:

- The terminal only adds detail records to the end of the open batch file.
- You can substitute one detail record for another in the open batch, but the records must be the same length after compression.
- You cannot delete single detail records from the batch.
- You may store any number of detail records in each batch.
- The maximum number of detail records you can store in a batch is only limited by the amount of available memory.
- The only way to close a batch is to open a new one.
- Once you close a batch you cannot re-open it to write to it (read only).
- You can delete an entire batch, or all of the batches in memory.

TRANZ 330/340 Versions 2.1 or Greater and TRANZ 380

For TRANZ 330/340 versions 2.1 or greater and TRANZ 380, additional features include:

- You can append or insert detail records to any selected batch.
- You can delete any detail records from any batch.

Message Format Flags

There are 16 standard control strings that enable the terminal to function as a credit card and check authorization terminal. These standard control strings are specifically designed for financial, point-of-sale applications and determine:

- which of the terminal's two default protocols (VISA first or second generation) will be used;
- the order in which prompts are displayed;
- how the terminal builds the transmit packet.

The 16 standard control strings are numbered from 0 to 15. To select one of these standard control strings you must store the associated number (0 to 15) in memory location x05/0x05 (where x= the number of the transaction key). The number associated with a particular control string is called a message format flag (MFF).

Note: Message format flags 4-15 are not available in the default application for TRANZ 330 versions 3.0 or greater and TRANZ 380.

The following list identifies the message format flags, their associated control strings and a description of the flag.

Table 2-3. Message Format Flags

Flag	Control String	Description
0	QF1E5.2CSF2K2.4I1CSF3K4	1st generation, w/check digit
1	QF1E4.2SF2K2.4I1SF3K4	1st generation
2	QF1E5.2CSF2K2.4I1CSR28F3K4R28	2nd generation, w/check digit
3	QF1E4.2SF2K2.4I1SR28F3K4R28	2nd generation
4	QF4K2.2F1E5.2CSF2K2.4I1SF3K4	1st generation transaction code before account w/check digit
5	QF4K2.2F1E4.2SF2K2.4I1SF3K4	1st generation, transaction code before account w/check digit
6	QF4K2.2F1E5.2CSF2K2.4I1CSR28F3K4R28	2nd generation, transaction code before account w/check digit
7	QF4K2.2F1E4.2SF2K2.4I1SR28F3K4R28	2nd generation, transaction code before account w/check digit
8	QF1E5.2CSF2K2.4I1CSF3K4R35F4K2.2	1st generation, NDC transaction code after amount w/check digit
9	QF1E4.2SF2K2.4I1SF3K4R35F4K2.2	1st generation, NDC transaction code after amount w/check digit
10	QF1E5.2CSF2K2.4I1CSR28F3K4R35F4K2.2	2nd generation, NDC transaction code after amount w/check digit
11	QF1E4.2SF2K2.4I1SR28F3K4R35F4K2.2	2nd generation, NDC transaction code after amount w/check digit
12	QF1E5.2CSF2K2.4I1CSF3K4R28F4K2.2	1st generation, transaction code after amount, w/check digit
13	QF1E4.2SF2K2.4I1SF3K4R28F4K2.2	1st generation, transaction code after amount
14	QF1E5.2CSF2K2.4I1CSR28F3K4R28F4K2.2	2nd generation, transaction code after amount w/check digit
15	QF1E4.2SF2K2.4I1SR28F3K4R28F4K2.2	2nd generation, transaction code after amount

Following are a few examples of message format flags with detailed descriptions of their associated control strings. These examples will help you understand how TCL commands are joined together to form control strings.

Example 1: Message Format Flag 0
The default message format flag, 0, uses the VISA first generation protocol with a Luhn check digit. The control string associated with flag 0 is:

QF1E5.2CSF2K2.4I1CSF3K4 or

Q F1 E5.2 C S F2 K2.4 I1 C S F3 K4

Where:

Command	Description
Q	The write control character (WCC); a special code inserted into the transmit packet telling the host which protocol to use (single or multiple-transaction protocol) and how the account number was entered (from cardreader or keypad).
F1	Command to display fixed prompt 1, "ENTER ACCOUNT #." The F command selects and displays a fixed prompt; the number following the F identifies which fixed prompt the terminal should display.
E5.2	Command to accept numeric input from either the cardreader or the keypad, and skip 5 steps if input was received from the cardreader.
E	input command which tells the terminal to accept data from either the cardreader or the keypad.
5	the number of commands to skip when input is received from the cardreader.
2	the type of input the terminal should accept; numbers only.
<p><i>Note: The E command can have a third parameter specifying the number of characters the terminal should accept when input is via the keypad. When the third parameter is not included the terminal uses the default value of 60 characters.</i></p>	
C	Command to verify the Luhn check digit; verifies the validity of the account number
S	Begin dialing
F2	Command to display fixed prompt 2, "EXPIRY DATE MMYY"
K2.4	Command to accept input from the keypad only; valid inputs include up to 4 numeric characters
K	accept input from keypad only
2	the type of input the terminal should accept; numeric only
4	the maximum number of characters to accept
I1	Command to skip one command
C	Verify Luhn check digit

Command	Description
S	Begin dialing
F3	Command to display fixed prompt 3, "AMOUNT OF SALE"
K4	Command to accept input from the keypad only; accept only numeric characters and force two decimal places
K	accept input from keypad only
4	the type of input the terminal should accept; numbers only with two forced decimal places (used when entering dollar amounts).

Note: When the second parameter of a K command is not stated, the terminal uses the default value, 60 characters, except for type 4, which has a default value of 10 characters.

**Example 2:
Message Format Flag 6**

The control string for message format flag 6 uses the VISA second generation protocol with the Luhn check digit, and requires the user to enter a transaction code before entering the account number. The control string associated with message format flag 6 is:

QF4K2.2F1E5.2CSF2K2.4I1CSR28F3K4R28 or

Q F4 K2.2 F1 E5.2 C S F2 K2.4 I1 C S R28 F3 K4 R28

Where:

Command	Description
Q	The write control character (WCC); a special code inserted into the transmit packet telling the host which protocol to use (single or multiple-transaction protocol) and how the account number was entered (from cardreader or keypad)
F4	Command to display fixed prompt 4, "ENTER TRAN CODE." The F command signals a fixed prompt; the number following the F identifies which fixed prompt the terminal should display.
K2.2	Command to accept input from the keypad only; valid inputs include up to 2 numeric characters
K	accept input from keypad only
2	the type of input the terminal should accept; numeric only
2	the maximum number of characters to accept

Command	Description
F1	Command to display fixed prompt 1, "ENTER ACCOUNT #."
E5.2	<p>Command to accept numeric input from either the cardreader or the keypad, and skip 5 steps if input was received from the cardreader.</p> <p>E input command which tells the terminal to accept data from either the cardreader or the keypad</p> <p>5 the number of commands to skip when input is received from the cardreader</p> <p>2 the type of input the terminal should accept; numeric only</p>
	<p><i>Note: The E command can have a third parameter specifying the number of characters the terminal should accept for this input. When the third parameter is not included the terminal uses the default value of 60 characters.</i></p>
C	Command to verify the Luhn check digit; verifies the validity of the account number
S	Begin dialing
F2	Command to display fixed prompt 2, "EXPIRY DATE MMYY"
K2.4	<p>command to accept input from the keypad only; valid inputs include up to 4 numeric characters</p> <p>K accept input from keypad only</p> <p>2 the type of input the terminal should accept; numeric only</p> <p>4 the maximum number of characters to accept</p>
I1	Command to skip one command
C	Verify Luhn check digit
S	Begin dialing
R28	Command to append a field separator into the destination buffer
	<p>R append literal string or an ASCII decimal value to the destination buffer</p> <p>28 the ASCII decimal equivalent for a field separator</p>

Command	Description
F3	Command to display fixed prompt 3, "AMOUNT OF SALE"
K4	Command to accept input from the keypad only; accept only numeric characters and force two decimal places
K	accept input from keypad only
4	the type of input the terminal should accept; numbers only with two forced decimal places (used when entering dollar amounts).
<i>Note: When the second parameter of the K command is not stated, the terminal uses the default value, 60 characters, except for type 4, which has a default value of 10 characters</i>	
R28	Command to append a field separator into the destination buffer

3. Programming Basics

Now that you have a better understanding of the terminal and its operating system, you should be ready for your application development. This section will lead you through the steps of designing, writing and debugging your application.

Designing the Application

The first step in developing an application program is the design phase. You will need to create a detailed description of each operation the terminal is to perform, identifying which keys must be pressed to initiate the operation. Remember, transactions (operations requiring communications) may be triggered by a single key press or card swipe while functions (operations that do not require communications) require two keys to be pressed in sequence.

Your application description should also include a list of prompts to be displayed, the proper prompt sequence for each operation, and the type (alphabetic, numeric, or alphanumeric) and source (cardreader, bar code reader or keypad) of operator input. If the application requires local data storage, you should also define the data storage format.

To support your design, you may also want to develop flow charts and pseudo code. You can then use the flow charts as an application "outline" or guide, and use the pseudo code as the base for developing the entire application code.

Once you have the design specification, you will need to allocate blocks of memory to your different operations to ensure the terminal has sufficient memory to accommodate the application program.

Defining Your Memory Map

The terminal has memory locations reserved for dedicated control strings, parameter data, and special functions. (See Appendix A for a complete memory map with a summary of these locations.) In addition to these locations, you will need to select memory locations for data and other control strings.

Since data collection requires a large amount of extraction, formatting, and manipulation of data, you will often find your control strings exceeding the 120 character capacity of a single memory location. To accommodate lengthy control strings, the terminal allows you to chain to other control strings, which can be stored in any logical block of general purpose memory locations, at your discretion. While reviewing the terminal's memory map, define sections (or blocks) of memory locations for your various operations and control strings.

Memory Management Guide

To help you optimize use of memory, VeriFone offers the following "Memory Management by Location" guide. Please remember, this guide is offered only as an example — it does not represent stringent memory management rules.

Note: In the table below, TRANZ 380 corresponding memory locations have 4-digits (40 = 0040, 113 = 0113, etc.).

Table 3-1. Memory Management by Location

Memory Location	Description
0-39	Reserved for the operating system. <i>Note: Although memory locations 20-29 are normally reserved for login strings, you can use these locations for regular control strings or data if no login strings will be used in your application.</i>
40-99	Used for special prompts, temporary data, flags, and counters. It's a good idea to store data that will be accessed often by the control strings in these locations as you can call the location using "nn" instead of "nnn", saving one character space. For example, you can use *L44 to call memory location *L044.
x00-x12	Reserved for host parameters.
113-199,	
213-255	Available for any type of control strings.
256-299,	Used for control strings, not including self-modified
313-399	Code that redirects control within this range of memory locations. <i>Note: VeriFone suggests you use these locations for control strings on the XL only due to variable size limitations. TRANZ 330/380 locations up to 949 (except those reserved for host parameters) are available for any type of control strings. 950 - 999 are reserved for the operating system.</i>
1050/1999	General records (TRANZ 380 only).

Do You Have Enough Memory?

At this point, you should know whether there is sufficient memory available in the terminal to accommodate your application. Once this determination is made, you can complete your specification.

Should you determine the terminal cannot accommodate your application, contact your VeriFone sales representative. Your representative can show you one of the VeriFone full-feature terminals that offers more memory and more capability.

Writing the Application

Using your design specification, identify the different "modules" or subroutines required for the application. Most applications will require three types of modules: transaction modules (transaction control strings initiated from location x07/0x07), special function modules (function control strings initiated from locations 031/0031 to 036/0036, and 039/0039), and support modules (subroutines called up by the transaction and function control strings for account ranging, accumulator updates, building data capture detail records, data entry, building the transmit buffer, etc.).

Once you've identified the modules required for your application, you will be ready to begin writing the source code.

Tips for Writing Source Code

- You can use any text editor to write source code; the only requirement is the editor must be able to store the text in a standard MS-DOS ASCII disk file format. VeriFone recommends using an IBM PC or 100% compatible computer and word processor with a non-document or text editing mode. Terminal application development tools supported by VeriFone will only run on IBM PC or compatibles.
- Ensure the syntax of the source code conforms to the guidelines outlined in the TCLOAD Reference Manual, part number 10016. TCLOAD is a proprietary development tool designed by VeriFone to allow you to quickly download applications to a terminal during the testing and development phase. TCLOAD also creates files that can be used by ZONTALK 2000 to downline load terminals out in the field.
- Write your control strings in long hand, including comments. The ";" is used as the comment symbol. For example:

Control

String	Comments
B5.5	;select buffer 5 as both source and destination buffer
G	;clear buffer
A5	;append contents of memory location 005/0005

- Make sure all data used with the commands are in upper case only. For example, use R'ABCDE', not R'abcde'. When data is stored in the terminal, it is upper shifted. If you then try to compare this with lower case data, it will not match.
- Remember, the maximum length of each memory control string location is 120 characters (60 for TRANZ EPROM versions prior to 2.1, XL versions prior to 2.4). After writing the control string in long hand, break it into groups of 120 characters.
- When counting the characters in a control string, remember to count every character, including periods (.) and commas (,).
- When your control string exceeds 120 characters, you will need more than one memory location in which to store it. Store the remainder of the control string in general record memory locations, using the "L" command to link one memory location to another.
- When breaking control strings longer than 120 characters, place the break on or before the 116th character as the "L" command will take up four characters (Lnnn; nnn = memory location to link to).

Control String Basics

Each TCL command is one or two characters long, and may have up to seven parameters, which modify the command. When you combine a series of commands into a single command line, you create a "control string." Control strings determine how the terminal will perform a transaction or function. By interpreting the control string, the terminal knows which prompts to display, what type of data input to accept, and which command it should execute next.

You can create control strings for each programmable transaction and function. You can create your own control strings to program up to nine transactions and seven functions.

Transaction Control Strings

You can write up to three control strings for each of the nine programmable transactions (associated with keys [1] through [9]). When a transaction key is pressed, the terminal begins executing the transaction control string stored in memory location x07/0x07 (where x = the number of the pressed key). The terminal will execute the control string beginning in x07/0x07, and continue by executing any control string that the transaction control string links to.

Note: The primary phone number (memory location x00/0x00) and the merchant identification (memory location x04/0x04) must be properly stored before the terminal can begin to execute the transaction control string.

The "Out of Memory Control String" (037/0037) is executed when the operating system determines that there is not enough memory available to perform the requested data storage command. After executing the control string in location 037/0037, control will return to the point in the control string where the out of memory condition first occurred. The control string in location 037/0037 should be written such that it either aborts (*K) the control string in progress or attempts to "free up" more memory by deleting old batches, etc.

Note: The Out of Memory Control String is not used in any terminal such as the XL300 or TRANZ 330 (3.0+), PNC 330 or TRANZ 380, that uses the new memory manager.

After the terminal executes the transaction control string, it will communicate with the host. Upon completing its communications with the host, the terminal will execute the "response analysis control string" stored in memory location x10/0x10, then execute the "auxiliary control string" stored in location x11/0x11. When memory locations x10/0x10 and x11/0x11 are empty, the terminal displays the response message received from the host, and returns to the idle state.

Note: The response analysis control string and the auxiliary control string are not mandatory. Should you desire, you can write a response analysis control string to examine the host's response, and save portions of the response message for record keeping purposes. The optional control string (x11/0x11) is available for any purpose.

Function Control Strings

You may write only one function control string for each of the seven programmable local functions. These control strings determine how the terminal performs certain functions.

When a function key is pressed (i.e., [FUNC] key + one of the keys numbered [1] through [6], or [9]), the terminal begins executing the function control string stored in memory location 03x/003x (where x = the number of the pressed key, e.g., 031/0031, 032/0032, etc.). The terminal will then execute any control strings linked to the function control string.

Loading the Application

After writing your control strings on a PC, you will need to load them into a terminal for testing. To load your application into the terminal, you can either manually enter it, or use a download program or transfer program offered by VeriFone. Because manual entry (keying in data via the terminal's keypad)

can be a lengthy and tedious process involving many keystrokes, VeriFone does not recommend it. Instead, VeriFone recommends using TCLOAD to download the application during the testing and development phase, or ZONTALK 2000 (the VeriFone proprietary download and database management software) to download your terminals once they are out in the field. See Section 4, Programming Tools, for more information about TCLOAD and ZONTALK 2000.

Debugging the Application

Once the application is loaded into the terminal, you can test and debug it without any external software or hardware by observing the input to and output from the terminal. You can set up memory locations to hold "snapshots" of the application input or output to facilitate debugging, and examine these memory locations using the terminal's STORE and RECALL functions.

TCL Programmer's Manual

4. Programming Tools

VeriFone provides and supports a number of programming tools that simplify and speed up the application development process. These tools include an actual terminal (for testing the application), the PC-terminal download cable, and TCLOAD, the terminal control language (TCL) download program. Another tool available for your terminal database management is ZONTALK 2000, the VeriFone download program. This section will identify and explain these programming tools.

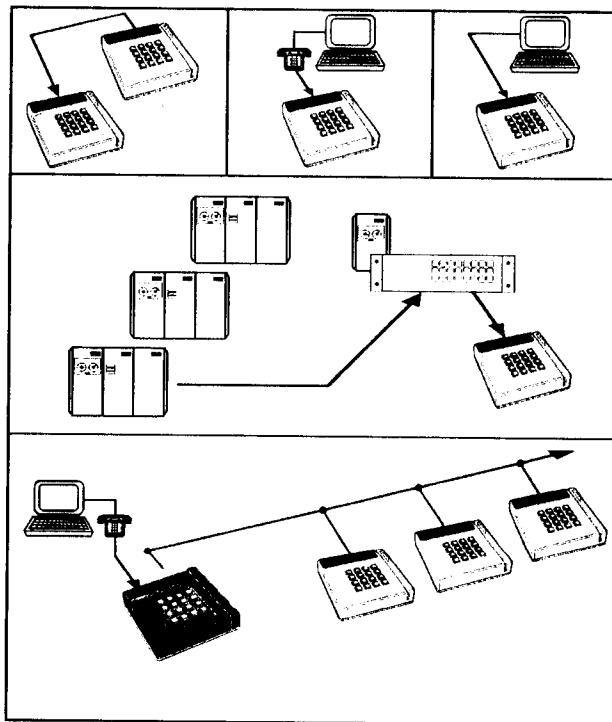


Figure 4-1. Methods for Downloading Applications

TCLOAD

TCLOAD is an assembler and download program that converts source code, written using TCL, to a format suitable for downloading into the terminal. After compiling the source code, TCLOAD can be directed to:

- download the terminal directly from the development PC,
- create a .DXL/.DTZ file, which VLOAD will use to direct download the terminal,

- create a .UDL file, which ZONTALK 2000 will use to remotely download terminals via dial-up telephone line, or TRANZIT Controller for download via the local area network (LAN) in the case of TRANZ 340.

During the application testing and development phase, the first two options will be the most frequently used. Once an application is developed and terminals are deployed, remote sites can be downloaded with application updates via the last option.

If you find that your version of TCLOAD is not working correctly, contact your VeriFone representative to obtain an updated version. For more information regarding TCLOAD, refer to Appendix E, "TCLOAD Basics."

TCLOAD Direct Download

When used to perform a direct download to a terminal, TCLOAD prepares a memory image of the application program, then transfers that image to an XL terminal at 2400 baud, or to a TRANZ 330/380 terminal at 19,200 baud. This option requires the terminal to be physically connected to the IBM PC development machine with a direct download cable.

Cable Part Numbers

Use one of the following cables when downloading from an IBM PC compatible computer:

- XL, TRANZ 330/340/380 to IBM PC: part number 00446-05 (DB25)
- XL, TRANZ 330/340/380 to IBM AT: part number 00446-04 (DB9)

TCLOAD .DXL/.DTZ File

The second option requires ZONTALK 2000 and the TCLOAD .DXL (or .DTZ) output file. A .DXL file is used with the XL; a .DTZ file with the TRANZ 330/380. These two files contain the memory image of the application program that is to be transferred into terminal memory. For this download, use a download cable to directly connect the terminal to a PC. Refer to the cable part numbers listed above.

When using this download method you must copy the .DXL file to your ZONTALK 2000 program disk. TCLOAD will perform the download at 2400 baud for the XL, or at 19,200 baud for the TRANZ 330/380. Refer to the *ZONTALK 2000 Reference Manual* in the ZONTALK 2000 Programmer's Package, part number P006-107-01, for information on setting up and performing a direct download to a terminal.

TCLOAD .UDL File

The third TCLOAD file option, the .UDL file, generates a text file that can be used by ZONTALK 2000 to perform modem downloads to update terminal and group parameters. When this third option is used, the terminal does not have to be physically close to the development machine as the download is performed over dial-up telephone lines.

The .UDL file may be edited — mark parameters for partial download by placing a 1 or a 0 in front of the memory location number. If a terminal calls in for a partial download, ZONTALK 2000 will only download those memory locations preceded by a "1." Refer to the *ZONTALK 2000 Reference Manual* for more information on ZONTALK 2000 options.

ZONTALK 2000

ZONTALK 2000 is a database and telecommunication program designed to simplify the process of downloading application data to remote transaction terminals. ZONTALK 2000 runs on an IBM PC or 100% compatible computer, and allows a single operator to create and maintain terminal records (containing application code and parameters) for any type of VeriFone terminal. Upon request from a terminal, ZONTALK 2000 automatically downloads application data to that terminal via dial-up telephone lines.

The ZONTALK 2000 database provides the means to truly customize each terminal. During the application development cycle, you should determine how you want to use ZONTALK 2000 to manage the terminal database. For more information, refer to the *ZONTALK 2000 Reference Manual*, which explains how the program works and the files required to use it.

5. TCL Commands

Commands by Functional Group

The Terminal Control Language (TCL) includes commands that control the input of data into the terminal, the processing of that data, and the output of data to the remote host, terminal display, or printer. In addition to data processing commands, TCL also includes commands to do operations like arithmetic, program/flow control and diagnostic testing.

This section includes a list of the TCL commands by functional groups, followed by a detailed alphabetical listing of all commands.

Buffer Operations (18)

Command	Description	See Page
A	Append Data from Memory Location	5-7
B	Select the Source and Destination Buffer	5-13
D	Delete Characters from Destination Buffer	5-27
G	Clear Destination Buffer	5-47
H	Search for String in the Source Buffer	5-51
J	Append Clock Data to Destination Buffer	5-68
+J	Buffer Modification	5-73
O	Move Extraction Pointer Within Source Buffer	5-99
Q	Append Write Control Character	5-107
R	Append Constant Value to Destination Buffer	5-114
+S	Get Buffer Size	5-128
T	Perform Arithmetic Operations	5-130
U	Copy Buffer to a Memory Location	5-140
+V	Append Signon Message to Buffer	5-154
X	Append Source Buffer to Destination Buffer	5-160
Y	Append Non-Blank Memory Location	5-167
Z	Pad Destination Buffer	5-175
*Z	Calculate Free Bytes	5-177

TCL Programmer's Manual

Communication Control (16)	Command	Description	See Page
	+B	Calculate Block Character Check (BCC)	5-17
	+D	DTMF Tone Dial	5-31
	+F	Enable/Disable Response ACK	5-45
	*I	Character I/O Over DIN 8 Port	5-60
	+I	Character I/O Over Modem Port LAN Send and Receive (TRANZ 340 only)	5-63 5-66
	+K	Carrier Control	5-81
	+M	Set Modem Parameters	5-93
	*P	Specify Communications Characters	5-104
	*R	Select Communication Device, Speed	5-116
	+R	Get/Set RS-232 Handshake Lines	5-120
	*T	Specify Communications Timeouts (Dial Terminals) Specify Communications Timeouts (Poll Terminals)	5-132 5-135
	+T	Characters I/O Over DIN 6 Port	5-137
	+U	Set DIN 6 Communication Parameters	5-145
	*V	Append Telephone Status Code Append LAN Status Code (TRANZ 340 only)	5-150 5-152
	+X	Transmit Data to the Network	5-165
	+Y	Receive Network Data Within Timeout	5-172
Data Capture and Batch Functions (8)	Command	Description	See Page
	*A	Open New Batch	5-9
	*B	Select Batch for Read Operations	5-15
	*C	Copy Destination Buffer to Batch	5-22
	*D	Delete Batch, Records or Headers	5-29
	*E	Copy Batch Detail to Destination Buffer	5-37
	*F	Detect Data Capture Errors	5-43
	+G	Append Detail Record into Batch	5-49
	*S	Verify Memory Available	5-126
	*Z	Calculate Free Bytes	5-177

5. TCL Commands

Data Entry (7)		Command	Description	See Page
		E	Input From Cardreader or Keypad	5-33
		+E	Input and Display with Decimal Places	5-39
		K	Input From Keypad Only	5-76
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Alphabetical Listing of TCL Commands

The following section alphabetically lists each TCL command and its associated parameters. Each command includes a brief description, the functional group the command belongs to, the status of the source and destination buffer with each command, the command format, a description of each command parameter and examples of how the command might be used.

Parameter Coding Legend

As an aid in the presentation of each TCL command, codes have been developed to represent each parameter. This alphabetic coding has been divided into nine single-digit representations (e.g., the "s" parameter consistently represents the number of commands to skip). Each digit represents the same parameter-type throughout the command listing. Subscript numbers (1,2,3...) are used to distinguish between more than one of the same-type code within a command; so the "E" command, which has two skip commands, is represented as Es1.a.j.s2.i. The legend for the coding is as follows:

Parameter	Description
a	Arbitrary Code
b	Buffer
c	Constant (decimal number or string)
i	Minimum Value
j	Maximum Value
m	Memory Location
n	Number (counts)
o	Math Operation
s	Forward Skip (for backward skip, precede parameter with "-" sign)
t	Time
v	Variable (use "#" (pound) sign before parameter, even if v=0, the default value)

Note: In the following examples, periods are used to designate parameter separators although commas may also be used for this.

When a memory location is referenced and it applies to the TRANZ 380, it is assumed that the number is preceded by a "0". TRANZ 380 memory locations are four-digits long.

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A Append Data from Memory Location

Description: Appends data from a specified memory location to the destination buffer and allows you to skip commands if the memory location is empty.

See Also:	Command	Description
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	R	Append Constant
	+V	Append Sign on Message
	X	Append from Source
	Y	Append On-Blank Memory Location

Category: Buffer Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change Buffer updated

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

A.m.S

Parameters:	Parameter	Default Value	Description
	m	000	Optional; three-digit memory location — the data from this location is appended to the destination buffer; default value 000 appends the download phone number.
	s	0	Optional; the number of commands to skip when the memory location is empty.

Note: When specifying memory locations, you may eliminate leading zeros to conserve memory. For example, use "14" to specify memory location 014.

A - Append Data from Memory Location

Examples:	Command	Operation
		; This routine is called to make sure the printer flag is set for a roll printer.
		; Memory location 950 should have a value of "2".
	166\$	
	B5.5	; Select work buffer
	G	; Clear buffer 5
	A950.1	; Append the printer flag from ; memory location 950,
		; if empty skip 1 command
	I1.1.50	; If printer flag is set to a "2", ; skip 1 because the printer ; selection has been set to a ; roll printer
	L180	; Go to routine to handle printer ; not selected
	*M	; Return

***A Open New Batch**

Description: Opens (or creates) a new batch and uses the data in the destination buffer as the batch header. If the destination buffer is empty or if the header of the current batch matches the header in the destination buffer, the current batch remains open and no change is made. When the header of the current batch does not match the header in the destination buffer, the current batch will automatically close and a new batch will be opened.

*Note: For additional information on error conditions, see command "*F"; for execution details, see Appendix D of the TRANZ 380 Reference Manual.*

See Also:	Command	Description
	*B	Select Batch
	*C	Copy Buffer to Batch
	*D	Delete Batch Information
	*E	Copy Batch Detail to Buffer
	*F	Detect Data Capture Errors
	+G	Append Detail Record to Batch

Category: Data Capture and Batch Functions

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer read; no change

Terminals Supported: Terminal Special Conditions

PNC 330/340	Parameter "s" not available
XL	Parameter "s" not available
TRANZ 330/340	Parameter "s" not available
TRANZ 380	Parameter "s" available on versions 1.10 or greater

Command Format:

***AS**

Parameters:	Parameter	Default Value	Description
	s	0	Optional; the number of commands to skip if the operation is successful.

***A - Open New Batch**

Example:	Command	Operation
	; This routine is used to open a batch, each batch has a header name made	
	; of the word "BATCH" appended with the batch number, which is	
	; incremented with each open.	
280\$		
	B.3	; Select work buffer 3
	G	; Clear buffer
	A49	; Append "1" to buffer
	T50	; Add 1 to batch number
	G	; Clear buffer
	R'BATCH'	; Append "BATCH" to buffer
	A50	; Append batch number to buffer
	*A	; Open batch with header matching ; destination buffer contents
	*F2.2	; If batch opened, skip 2 else
	P71	; Display "BATCH NOT OPENED"
	*K1	; Abort and leave the current display

+A Compare Variable

Description: Compares a variable to a constant or to another variable. On PNC 330/340, TRANZ 330/340 versions 1.3 or greater and TRANZ 380, a variable can be any number ranging from 0-65535. On TRANZ versions 1.2 and below and all XL versions the variable range is 0-255. The terminal will truncate any set variable that is greater than its range. You must use "#" (pound sign) to indicate a variable, even when the default value is 0. This is a standard mathematical comparison.

Warning: Setting a variable to an alphanumeric string will have unpredictable results.

See Also: **Command** **Description**

For Variable Commands:

*N	Set Variable
*O	Arithmetic on Variables
+Q	Append Variable to Buffer
*Q	Set Variable From Buffer

For Comparison Commands:

+C	Buffer Comparison
I	Comparison Operator

Category: Variable Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change No change

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Available on versions 2.5 or greater
TRANZ 330	Available on versions 1.3 or greater
TRANZ 330 (202)	Available on versions 2.1 or greater
TRANZ 340	Available on versions 2.1 or greater
TRANZ 380	None

+A - Compare Variable

Command Format:

+A#v.a.c.s

Parameters:

Parameter	Default Value	Description
#v	0	Optional; the variable to compare; when specifying a variable, precede the number with a pound (#) sign; for example, to specify variable 2, write +A#2
a	0	Optional; operation code options include: 0 = V (variable) is equal to C/V (constant/variable) 1 = V is greater than C/V 2 = V is less than C/V
c	0	Optional; this parameter may be a constant or variable (C/V); if the parameter is a variable, precede the number with a pound (#) sign.
s	0	Optional; number of commands to skip if comparison is true.

Examples:

Command

Operation

; This routine prints the common header for all transactions, but calls one ; routine for void transactions to finish printing and another routine for all ; other transactions. The transaction type is stored in variable #1.

130\$

F73	; Display "PRINTING..."
G	; Clear destination buffer
*L180	; Call routine to printing common header
+A#1..3.1	; If void transaction (=3) skip 1.
L181	; Print body routine for transactions other than a void
L182	; Print body routine for void transaction

B Select the Source and Destination Buffer

Description: Selects either or both the source and destination buffers. If a source buffer is specified, resets the extraction pointer.

See Also:	Command	Description
	A	Append Data from Memory Location
	D	Delete Characters from Buffer
	G	Clear Destination
	H	Search for String
	+J	Buffer Modification
	O	Move Extraction Pointer
	+S	Get Buffer Size
	U	Copy Buffer to Memory Location
	V	Display Buffer
	Z	Pad Destination Buffer

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	Selects buffer to read operations; pointer at start of buffer only if first parameter is used	Buffer selected for write operations

Terminals Supported: Terminal Special Conditions

PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

Bb1.b2

B - Select the Source and Destination Buffer

Parameters:

Parameter	Default Value	Description
b1	0 0	Optional; code to select the source buffer; default flag 0 selects the current buffer; options include: Current source buffer, without resetting extraction pointer 1 Buffer #1 - Transmit Buffer 2 Buffer #2 - Receive Buffer 3 Buffer #3 - Data Capture Buffer 4 Buffer #4 - Print Line Buffer 5 Buffer #5 - Temporary Buffer 9 Reset source buffer extraction pointer

Note: When one of the buffers, 1 through 5, is selected as the source buffer, the extraction pointer is set to the first character within that buffer. If 9 is selected, the terminal resets the extraction pointer to the first character in the current source buffer.

b2	0	Optional; code to select the destination buffer; the default flag 0 selects the current buffer; other options include: 0 Current destination buffer 1 Buffer #1 - Transmit Buffer 2 Buffer #2 - Receive Buffer 3 Buffer #3 - Data Capture Buffer 4 Buffer #4 - Print Line Buffer 5 Buffer #5 - Temporary Buffer
----	---	---

Examples:

Command	Operation
; This routine is called after a response message is received from host and	
; we want to extract the approval number which follows the third field	
; separator for 6 digits.	
160\$	
B.2	; Select receive buffer which contains host response
U190	; Save the entire host response
B2.3	; Select the receive buffer as the source buffer and 3 as the destination buffer
H	; Find the first field separator in the host response
O	; Move the extraction pointer by 1
H	; Find the second field separator in the host response
O	; Move the extraction pointer by 1
H	; Find the third field separator in the host response
X6	; Copy the 6-digit approval number into buffer 3
U50	; Save the approval number

***B Select Batch for Read Operations**

Description: Selects an existing batch for data capture operations such as the "*E" (extract) or "*D" (delete) commands, and resets the record pointer. For example, before you can read/delete a record or delete a batch, select it using the "*B" command.

If you attempt to select a batch that does not exist, the terminal will set the data capture error 2, INVALID BATCH.

Note: Refer to Appendix D of the TRANZ 380 Reference Manual for more information on execution details.

See Also:	Command	Description
	*A	Create/Open Batch
	*C	Copy Buffer to Batch
	*D	Delete Batch Information
	*E	Copy Batch Detail to Buffer
	*F	Detect Data Capture Errors
	+G	Append Detail Record to Batch

Category:	Data Capture and Batch Functions	
Buffer Status:	Source Buffer	Destination Buffer

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"s" not available
	XL	"s" not available
	TRANZ 330/340	"s" not available
	TRANZ 380	"s" available on versions 1.10 or greater

*B - Select Batch for Read Operations

Command Format:

***Ba.S**

Parameters:

Parameter	Default Value	Description
a	0	Optional; code to indicate batch for read operation: 0 selects the current (youngest) batch 1 selects the oldest batch 2 selects the next batch; batch immediately following the one pointed to by batch pointer 3 selects batch with header record matching the contents of the destination buffer
s	0	Optional; number of commands to skip if the operation is successful.

Example:

Command	Operation
; This routine is used to select a batch to read or update. If the batch does not exist an error will be reported.	
72=BATCH NOT FOUND	
285\$	
B.3	; Select work buffer 3
G	; Clear buffer
R'BATCH'	; Append "BATCH" to buffer
A50	; Append batch number to buffer
*B3	; Select batch w/ header matching dest buffer contents
*F2.2	; If batch selected skip 2 else
P72	; Display "BATCH NOT FOUND"
*K1	; Abort and leave the current display

+B Calculate Block Character Check

Description: Calculates the Block Character Check (BCC) on the contents of the destination buffer and places the result in the designated variable. To allow BCC calculation of data from multiple destination buffers, the initial value of the BCC is understood to be the current contents of the designated variable each time the +B command is executed. The BCC is used as a checksum to ensure validity of communications data; currently the only type of BCC offered is an LRC.

NOTE: Do not attempt the +B command on an empty buffer.

Category: Communications Control

Buffer Status:	Source Buffer	Destination Buffer
----------------	----------------------	---------------------------

No change	No change; buffer read
-----------	------------------------

Terminals Supported:

Terminal	Special Conditions
-----------------	---------------------------

PNC 330/340	None
XL	2.60 or greater
TRANZ 330	Available on versions 2.0 or greater*
TRANZ 340	Available on versions 2.1 or greater
TRANZ 380	"a1" available on versions 1.10 or greater

**The command will not execute in TRANZ 330 version 2.0 if the initial value of the variable is 00. You must first initialize the variable to a non-zero value, execute the command, then exclusive OR (XOR) the result of +B with the initial value for the correct LRC in the variable.*

+B - Calculate Block Character Check

Command Format:

+B#v.a

Parameters:

Parameter	Default Value	Description
#v	0	Optional; variable to place result of calculation
a	0	Optional; the type of BCC 0 LRC 1 CRC (TRANZ 330 3.60+, PNC 330 3.5+, and TRANZ 380 version 1.10+)

Examples:

Command	Operation
; This routine builds a packet and calculates the LRC, then appends the	
; packet to the <STX> in the transmit buffer	
; Packet format is: <STX>account number<FS>expiry	
; date<FS>amount<ETX>LRC	
; Note that LRC is calculated on packet prior to appending the <STX>	
;	
270\$	
B.1	; Select transmit buffer as destination
G	; Clear destination buffer
R2	; Append
B.5	; Select work buffer as destination
G	; Clear destination buffer
A75	; Append account number from memory location 75
R	; Append
A76	; Append expiration date from memory location 76
R	; Append
A77	; Append amount from memory location 77
R3	; Append
+B#0	; Calculate LRC, add to the variable #0
+Q#0.1	; Append variable #0 to buffer, converted to ; ASCII char
B5.1	; Select work buffer as source, transmit buffer ; as dest
X	; Append work buffer to in transmit buffer

C**Verify Check Digits**

Description: Causes the terminal to perform the LUHN (MOD 10) check digit algorithm on the last data entry or contents of the destination buffer. The command also allows MOD 11 verification. This algorithm is designed to find data entry errors and is used as a fraud control measure to ensure the legitimacy of a credit card account number. MOD 11 only accepts a nine-digit number. A valid account number contains 0-9 digits. A space or control character is not valid. If the terminal finds an error, it can display the message "BAD ACC'T NUMBER" and aborts the transaction leaving the message on the display, or skips "s" commands.

(Will not execute properly on Track 1 cardreader data input in TRANZ 330 versions less than 3.60.)

Category: Fraud Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340 XL TRANZ 330/340 TRANZ 380	None "s" available on version 2.5 or greater C ₂ and "s" available on version 2.1 or greater None

Command Format:

Ca.s

Parameters:

Parameter	Default Value	Description
a	0	Optional; Options for this parameter are: 0 verify LUHN check digit within the last data entry 1 verify LUHN check digit within the contents of the destination buffer 2 verify the Mod 11 check digit on the data in the destination buffer
s	0	Optional; number of commands to skip if check digit is invalid

Note: When the "a" parameter equals zero (0), the "C" command must immediately follow the data entry ("E" or "K") command.

C - Verify Check Digits

Parameters: (continued)	Parameter	Default Value	Description
	s (cont.)	0 <>	If invalid check digit, terminal displays BAD ACC'T NUMBER and aborts if invalid check digit, skip this number of commands (allowable values:1-120); a plus skip must not use a "+" sign in the control string.
Example:	Command		Operation
			<p>; Get the account data either manually or from the cardreader. ; Do Luhn check digit test. 121\$ B3.3 ; Select source and destination buffer as 3 G ; Clear destination buffer F1 ; Display fixed prompt "ENTER ACCOUNT #" E5.3 ; Accept entry from cardreader or keypad skip 5 ; commands if the input is from the cardreader, ; accept alphanumeric characters I-3.1 ; If nothing is entered, start over getting input D ; Delete field separator at end C1 ; Do mod 10 check digit on manually entered number *L122 ; Get expiration date manually, store account number, ; and expiration date I7 ; Skip over MAG stripe handling code C ; Do Luhn check digit U95 ; Store account number and expiration date B.5 ; Select destination buffer 5 G ; Clear destination buffer H.61 ; Search source buffer for an "=", which is start of ; expiration date O ; Move extraction pointer 1 pass "=" X4 ; Copy the expiration date from source buffer ; to the destination buffer </p>

Note: Following is an example of a LUHN calculation.

If the card number is equal to 401288888881881, then the Check digit is equal to the last digit. Check digit = 1.

The calculation is as follows:

$$\begin{array}{cccccccccccccccc}
4 & 0 & 1 & 2 & 8 & 8 & 8 & 8 & 8 & 8 & 8 & 1 & 8 & 8 & 1 \\
x2 & x1 & x2
\end{array}$$

$$\begin{array}{cccccccccccccccc}
8 & 0 & 2 & 2 & 16 & 8 & 16 & 8 & 16 & 8 & 16 & 8 & 2 & 8 & 16
\end{array}$$

Add the digits together:

$$\begin{array}{r} 8 + 0 + 2 + 2 + 1 + 6 + 8 + 1 + 6 + 8 + 1 + 6 \\ + 8 + 1 + 6 + 8 + 2 + 8 + 1 + 6 = 89 \end{array}$$

Round the result up to the nearest multiple of 10 and subtract the sum result from the rounded number:

$$90 - 89 = 1$$

The remainder is the check digit of the calculation.

***C - Copy Destination Buffer to Batch**

***C Copy Destination Buffer to Batch**

Description: Copies contents of destination buffer to open batch. If there is not enough memory to add record to open batch, terminal will set data capture error 1, NOT ENOUGH MEMORY.

*Note: When programming a PNC/TRANZ 330, this command can only be used to add records to the latest opened batch. Use the +G command for record addition to older batches. The *C command can replace a detail record of the same length in an older batch. Refer to Appendix D of the TRANZ 380 Reference Manual for execution details.*

See Also:	Command	Description
	*A	Create/Open Batch
	*B	Select Batch
	*D	Delete Batch Information
	*E	Copy Batch Detail to Buffer
	*F	Detect Data Capture Errors
	+G	Append Detail Record to Batch
Category:	Data Capture and Batch Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"s" not available
	XL	"s" not available
	TRANZ 330/340	"s" not available
	TRANZ 380	"s" available on versions 1.10 or greater

Command Format:

***C a.s**

*C - Copy Destination Buffer to Batch

Parameters:

Parameter	Default Value	Description
a	0	Optional; select one of the following values for this parameter: 0 copy destination buffer to the end of the open batch 1 replace the current detail record with the contents of the destination buffer
s	0	Optional; number of commands to skip if the operation is successful.

Note: When replacing a detail record, the destination buffer length must be exactly the same length as the record being replaced. Exercise caution — it is the COMPRESSED memory size that is compared; both the destination buffer and record must have the same number of alpha and numeric characters to have the same compressed size.

Example:

Command	Operation
; Add a record to the latest opened batch. Also check for error of not having enough memory to add a record.	
73=OUT OF MEMORY	
286\$	
*C	; Add record to batch with contents built ; in current destination buffer
*F2.1	; If not out of memory skip 2 else
P73	; Display "OUT OF MEMORY"
*K1	; Abort and leave the current display

+C - Buffer Comparison

+C Buffer Comparison

Description: The "+C" command is used for buffer comparison. The terminal makes a byte-by-byte comparison of source and destination buffers and determines if the source buffer is equal to, greater or less than the destination buffer. See Note and tables at the end of this command description.

*Note: This command does not filter out such special characters as space, - / *. If used, these characters will be included in the comparison on a byte-by-byte basis.*

See Also: **Command** **Description**

+A I	Compare Variable Comparison Operator
---------	---

Category: Process and Flow Control

Buffer Status: **Source Buffer** **Destination Buffer**

Buffer read; no change to the pointer	No change; buffer read
---------------------------------------	------------------------

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Not available
TRANZ 330	Available on versions 1.3 or greater
TRANZ 330 (202)	Available on versions 2.1 or greater
TRANZ 340	Available on versions 2.1 or greater
TRANZ 380	None

Command Format:

+Ca.S

Parameters: **Parameter** **Default Value** **Description**

a	0	Optional; options for this parameter are: 0 the source buffer is equal to the destination buffer. 1 source buffer is greater than the destination buffer 2 source buffer is less than the destination buffer
---	---	---

s 0 Optional; the number of commands to skip if the comparison is true.

Examples:	Command	Operation
	; Search batch for user-entered ticket #	
	326\$	
	*L328	; Get the ID number
	*L754	; Get the Ticket number & store it in 729
	B4.4G	
	A729	; Append Ticket #
	I1.1.'00000000'	; If data entered
	L330	; And see if ticket # found in the batch
	G	; Else, clear destination buffer
	F1	; Try to get the next key (account number)
	K2.25	; From the keyboard
	L327	; Continue in location 327
	330\$; buffer 4 contains user-entered ticket number ; buffer 3 will contain batch data
	B3.3	
	G	
	*E	; Skip to the batch header containing gratuity
		; Field to be updated
	*F13	; While not end of file else exit loop
	B3.5	; Set up to get user-entered key
	G	
	O53	; Point to key in record
	X8	; Get the ticket # from the batch
	B4.5	; Compare buffer 4=ticket # to 5=batch ticket
	+C.1	; If ticket # not found
	I-10	; Skip this record and loop to next one
	G	; Else
	B3.3	; Ticket found in batch
	O63	; ENDIF. Now check if gratuity blank
		; Skip over to gratuity amount
	I1.2.'00000000'	; If gratuity amount not blank, skip 1
	L334	; Else gratuity blank, display amount and auth and ; allow entry of gratuity amount
	L	; Gratuity filled in, so skip to next record
	G	
	A316	; Otherwise, say 'no data match'
	V	; Until enter is pressed
	*K	; Exit

Note: When using +C0 (source buffer equal to destination buffer), the two buffers must be EXACTLY the same, including length, in order to be found equal. The following table summarizes this.

+C - Buffer Comparison

Source	Destination	Equal/Not Equal	
A	A	Equal	TRUE
A	AB	Not Equal	FALSE
AB	A	Not Equal	FALSE
A	A (leading blank)	Not Equal	FALSE

When using +C1 (source buffer greater than destination buffer), the source is found to be greater if it is longer than the destination, as summarized in the following table.

Source	Destination	Less or Equal/Greater	
A	A	Less or Equal	FALSE
A	AB	Less or Equal	FALSE
AB	A	Greater	TRUE
A	B	Less or Equal	FALSE
B	A	Greater	TRUE
A	A (leading blank)	Less or Equal	FALSE
A (leading blank)	A	Greater	TRUE

When using +C2 (source buffer less than destination buffer), the source buffer is found to be less if it is shorter than the destination, as summarized in the following table.

Source	Destination	Greater or Equal/Less	
A	A	Greater or Equal	FALSE
A	AB	Less	TRUE
AB	A	Greater or Equal	FALSE
A	B	Less	TRUE
B	A	Greater or Equal	FALSE
A	A (leading blank)	Less	TRUE
A (leading blank)	A	Greater or Equal	FALSE

D

Delete Characters from Destination Buffer

Description: Deletes characters from the end of the destination buffer.

See Also: **Command** **Description**

Delete Commands:

G Clear Destination

Buffer Commands:

B Select Buffers

G Clear Destination

H Search for String

+J Buffer Modification

O Move Extraction Pointer

+S Get Buffer Size

U Copy Buffer to Memory Location

V Display Buffer

Z Pad Destination Buffer

Category: Buffer Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change Characters deleted

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340 None

XL None

TRANZ 330/340/380 None

Command Format:

Dn

Parameters:

	Parameter	Default Value	Description
	n	1	Optional; the number of characters to delete from the end of the destination buffer; must be a positive number

D - Delete Characters from Destination Buffer

Examples:	Command	Operation
	; Get password and store it in a memory location for later use	
840\$		
B.3		; Select destination buffer 3
G		; Clear destination buffer
F47		; Display fixed prompt "ENTER PASSWORD"
K5.4..4		; Accept 4-digit alphanumeric password
D		; Remove field separator at end
U55		; Store password

***D Delete Batch, Records or Headers**

Description: Deletes all or selected detail records, batches and batch headers from the data capture memory specified by the "a" parameter. Before using the "*D" command, you must select a batch using the "*B" command.

Note: Refer to Appendix D of the TRANZ 380 Reference Manual for execution details.

See Also:	Command	Description
	*A	Open New Batch
	*B	Select Batch for Read Operations
	*C	Copy Destination Buffer to Batch
	*E	Append Batch Detail to Destination Buffer
	+G	Append Detail Record into Batch

Category: Data Capture and Batch Functions

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"s" not available
	XL	*D3 and "s" not available
	TRANZ 330	*D3 available on versions 2.1 or greater, "s" not available
	TRANZ 330 (202)	*D3 available on versions 2.1 or greater, "s" not available
	TRANZ 340	*D3 available on versions 2.1 or greater, "s" not available
	TRANZ 380	"s" available on versions 1.10 or greater.

*D - Delete Batch, Records or Headers

Command Format:

***Da.S**

Parameters:

Parameter	Default Value	Description
a	0	Optional; data capture item to be deleted; options for this parameter include: 0 delete selected batch and batch header 1 delete all detail records for selected batch 2 delete all batches and detail records 3 delete selected detail record from any batch
s	0	Optional; number of commands to skip if the operation is successful

Example:

Command	Operation
; This routine is used to delete a selected batch with its detail records and	
; report any errors on deleting the batch.	
72=BATCH NOT FOUND	
287\$	
B.3	; Select work buffer 3
G	; Clear buffer
R'BATCH'	; Append "BATCH" to buffer
A50	; Append batch number to buffer
*B3	; Select batch with header matching destination buffer contents
*F2.2	; If batch selected skip 2 else
P72	; Display "BATCH NOT FOUND"
*K1	; Abort and leave the current display
*D	; Delete selected batch and batch header

+D DTMF Tone Dial

Description: Causes the terminal to use DTMF (dual tone multifrequency) —also called touch tones — to dial the characters in the destination buffer. Only characters "0-9," "A-D," "*" and "#", are dialed. This command also specifies the length of the touch tone digits which affects the dial speed.

Note: If you use +D to dial a phone number, you must first use S3 to go off hook.

See Also:	Command	Description
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read

Terminals Supported:	Terminal	Special Conditions
	PNC 330	None
	PNC 340	Not available
	XL	Not available
	TRANZ 330	Available on versions 1.3 or greater
	TRANZ 330 (202)	Not available
	TRANZ 340	Not available
	TRANZ 380	None

Command Format:

+Dt

+D - DTMF Tone Dial

Parameters:	Parameter	Default Value	Description
	t	50ms (10dps)	Optional; the period of tone, which is the "t" parameter times 10ms (Default t=5)

Examples:	Command	Operation
	; This routine will cause the terminal to go off hook and dial the digits "123". 148\$ S3 ; Go off hook *W1 ; Wait 1 second for dial tone G ; Clear the destination buffer R'123' ; Append "123" to the destination buffer +D ; Dial the contents of the destination buffer	

E Input from Cardreader or Keypad

Description: Causes the terminal to accept input from either the cardreader or the keypad, automatically places a field separator after the data entry (except when input type flag 4 is selected) and appends the data to the destination buffer. The terminal checks to see if the account number is greater in length than 0 and less than 128 before copying to the destination buffer.

When input type flag 4 is selected and a field separator is desired, use the "R" command to append a field separator to the end of the entered data. The minimum number of characters for this flag will be four because of padding and the decimal point. Null cannot be used.

Note: The cardreader buffer will be cleared when the terminal receives keyboard input, thus preventing problems that could result from incorrect data entry.

See Also:	Command	Description
	+E	Input Variable Decimal Point
	K	Input from Keypad Only
	M	Input from Card Reader Only
	*U	Input from Bar Code Reader
	*Y	Check Input Devices
Category:	Data Entry	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	s3, a2 and c not available
	XL	s2, s3, a2, i and c parameters are not available
	TRANZ 330	"i" parameter available on version 1.3 or greater, s3, a2 and c not available
	TRANZ 330 (202)	"i" parameter available on version 2.1 or greater, s3, a2 and c not available
	TRANZ 340	"i" parameter available on version 2.1 or greater, s3, a2 and c not available
	TRANZ 380	None
	ZON 5XX	(See Appendix J for unique usage)

E - Input from Cardreader or Keypad

Command Format:

Es1.a.j.s2.i.s3.a2.C

Parameters:

Parameter	Default Value	Description
s1	0	Optional; number of commands to skip when input is from the cardreader; the default is 0
a1	0	Optional; the input type flag; identifies the type of input criteria to be applied when data entry is from keypad; the default flag is 3, (alphanumeric chars) Other options include Input Type Flag: 1 alphanumeric 2 numeric 3 alphanumeric characters 4 amount; the decimal is added automatically; the default field length is 10 characters with a maximum length of 15 5 alphanumeric; hidden entry (displays *****) 6 numeric; hidden entry (displays *****) 7 alphanumeric; hidden entry; password verification; entered data is not appended to the destination buffer; if password entered incorrectly, terminal beeps and aborts operation
j	60	Optional; maximum number of input characters the terminal will accept from the keypad; 60 for XL, 120 for PNC/TRANZ; default for input type flags 1, 2, 3, 5, 6 and 7 is 60 characters; the default for input type 4 is 10 characters. The maximum length for amount data is 15.
s2	0	Optional; the number of commands to skip after a NULL entry from keypad. NULL entry occurs if you press [FUNC/ENTER] without entering data. Only valid for keyboard entry.
i	0	Optional; minimum number of input characters from the keypad. Only valid for keyboard entry. <i>Note: If greater than "j", "i" will be set to zero.</i>
<i>TRANZ 380 Only:</i>		
s3	0	Number of commands to skip if three bad card reads. <i>Note: When reading two tracks, if one track contains an error or is not read properly, the terminal puts an error code in the destination buffer instead of the track information. The correctly read track will also be placed in the destination buffer, and the two tracks will be separated by the track separator. Errors are displayed as ^A - ^E on the terminal and as 0 - 5 in the destination buffer.</i>

Parameters: (continued)	Parameter	Default Value	Description
	a2	0	Track Selection Options 0 = Track 2 1 = Track 1 2 = Tracks 1 and 2 3 = Track 3 4 = Tracks 2 and 3
	c	29	Track separator
Example:	Command	Operation	
			;
			Get the 12-digit employee number and 8 digit department
			number either manually or from the cardreader. The two
			numbers are separated with a "**".
	180=ENTER EMPLOYEE #		
	421\$		
	B.3		; Select destination buffer as 3
	G		; Clear destination buffer
	P180		; Display custom prompt "ENTER EMPLOYEE #"
	E3.2.40.12		; Accept entry from cardreader or keypad
			; Skip 3 commands if input is from cardreader
			; accept numeric from 12 to 40 characters
	D		; Delete field separator at end
	*L422		; Get department number manually, store
			; employee number and department number
	I6		; Skip over MAG stripe handling code
	U95		; Store employee and department numbers
	B3.5		; Select source and destination buffer
	G		; Clear destination buffer
	H.42		; Search source buffer for a "**", which is start
			; of expiration date
	O		; Move extraction pointer 1 pass "**"
	X8		; Copy the department number from source
			; buffer to the destination buffer
	U96		; Store department number only

- Notes: When using a data type of 4 (amount),
- There is no null entry. If the user presses [ENTER] without entering data, 0.00 is appended to the destination buffer.
 - You can use the [*] key to toggle between negative and positive values, however, if you enter the maximum number of characters (15) in TRANZ 330 EPROMs less than 3.60, you will corrupt the last digit if you try to toggle to negative.
 - There is no minimum number of input characters.

E - Input from Cardreader or Keypad

For EPROMs with 10-digit math, the "A" parameter is set to 4 (amount) and parameter "J" is left as the default, maximum input is 10 digits. The "J" parameter can be set to a maximum of 15 characters. Maximum input for 15-digit EPROMs with the same settings is 15 characters. *Note: For U.S. firmware only, TRANZ 330 versions 3.60 and above feature 15-digit limitations.*

***E Append Batch Detail to Destination Buffer**

Description: Appends the batch header or the specified detail record from the current, open batch to the destination buffer. Before using this command, you must select a batch using the "****B**" command.

If you attempt to append a record that does not exist, the terminal will set the data capture error to 3 (RECORD NOT FOUND).

Note: Refer to Appendix D of the TRANZ 380 Reference Manual for execution details.

See Also:	Command	Description
	*A	Create/Open Batch
	*B	Select Batch
	*C	Copy Buffer to Batch
	*D	Delete Batch Information
	*F	Detect Data Capture Errors
	+G	Append Detail Record to Batch
Category:	Data Capture and Batch Functions	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"a3" and "s" not available
	XL	"a3" and "s" not available
	TRANZ 330/340	"a3" and "s" not available
	TRANZ 380	"a3" and "s" available on versions 1.10 or greater

Command Format:

***Ea.s**

*E - Append Batch Detail to Destination Buffer

Parameters:

Parameter	Default Value	Description
a	0	Optional; code identifying the data to be copied; options for this parameter include: 0 copy the next detail record in the selected batch 1 copy the first detail record in batch 2 copy the batch header 3 Find next detail record matching data in source buffer and copy into destination buffer. Data must match exactly, though source buffer data may be shorter than data in detail record.
s	0	Optional; number of commands to skip if the operation is successful.

Example:

Command	Operation
; This routine is used to read a record from a pre-selected batch	
74=RECORD NOT FOUND	
288\$	
G	; Clear destination buffer
*E	; Select next detail record in current batch
	; and append to destination buffer
*F2.3	; If a record found skip 2 else
P74	; Display "RECORD NOT FOUND"
*K1	; Abort and leave the current display

+E Input and Display with Decimal Places

Description: A keypad-only input command that allows definition of the number of decimal places to be displayed (between 1 and 9), the total number of digits that can be entered and what type of radix to use (either the standard US ‘.’ or the Latin America ‘,’). This command, useful in international programming, can also program separators after each thousand places — for example: 1,000,000.00.

See Also:	Command	Description
	E	Input from Card Reader or Keypad
	K	Input from Keypad Only
	M	Input from Card Reader Only
	*U	Input from Bar Code Reader
	*Y	Check Input Devices
Category:	Data Entry	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	Available on versions 2.4 or greater
	TRANZ 330	Available on versions 1.3 or greater
	TRANZ 330 (202)	Available on versions 2.1 or greater
	TRANZ 340	Available on versions 2.1 or greater
	TRANZ 380	None

Command Format:

+En1.n2.a

+E - Input and Display with Decimal Places

Parameters:	Parameter	Default Value	Description
	n1	2	Optional; number of decimal places to be displayed; maximum= 9 minimum= 1
	n2	10	Optional; maximum number of input digits; maximum= 14 minimum= 1
	a	0	Optional; the type of radix to use; 0 '.' Standard US radix without separators 1 ';' US radix with separators 2 ',' Latin America radix without separators 3 '.' Latin America radix with separators

Examples:	Command	Operation
	; This accepts a unit price that contains 3 decimal places	
	262\$; Reserved for Enter Unit Price 3 decimals
	G	; Clear buffer
	P62	; Say, "ENTER UNIT PRICE"
	+E3.7.0	; Accept 3-decimal place 7-digit unit price
	U464	; Store unit price
	U465	; Store it as extended price
	G	; Clear buffer
	A464	; Get unit price back
	B5	; Select source buffer
	I2.2.'0.000'	; Skip two commands if 0.000 is not found
	*G1	; Else, give an error beep
	I-10	; and reprompt for unit price

F Display Fixed Prompt

Description: Causes the terminal to either display a fixed prompt (which is stored in ROM) or append a fixed prompt to the destination buffer.

Attention: This command is not supported by the ZON 5XX product line or TRANZ 330/380 international versions.

Note: On the PNC 330 and TRANZ 330/380, the F command will not affect the display until keyboard entry has occurred. If a card is swiped from the idle prompt and an "F" command appears in the code before the "E" or "K" command, the display will not be updated. Use the "V" command if the prompt is to be displayed regardless of data availability.

See Also:	Command	Description
	*J	Justify Display
	P	Display Custom Prompt
	V	Display Buffer
Category:	Outputs and Data Display	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer not changed unless specific parameter option selected
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	Not available on TRANZ 330/380 International versions
	ZON 5XX	Not available

Command Format:

Fn.a

F - Display Fixed Prompt

Parameters:

Parameter	Default Value	Description
n	none	Required; fixed prompt number; (see Appendix F. "Fixed Prompts Tables" for a list); you must assign a value to enable the terminal to execute the command
a	0	Optional; options for this parameter are: 0 display fixed prompt if there is no pending input 1 append fixed prompt to the destination buffer

Examples:

Command	Operation
F31	; Display the prompt "ENTER AUTH CODE." ; Refer to the Appendix F. "Fixed Prompts ; Tables" for code 31 and other prompts.
F28.1	; Append the prompt "END OF REPORT" to ; the destination buffer.

***F Detect Data Capture Errors**

Description: Detects and fixes data capture errors.

See Also: **Command** **Description**

*A	Create/Open Batch
*B	Select Batch
*C	Copy Buffer to Batch
*D	Delete Batch Information
*E	Copy Batch Detail to Buffer
+G	Append Detail Record to Batch

Category: Data Capture and Batch Functions

Buffer Status: **Source Buffer** **Destination Buffer**

No change No change

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	None
TRANZ 330/340	None
TRANZ 330 (202)	None
TRANZ 380	None

Command Format:

***Fs.a**

Parameters:

Parameter	Default Value	Description
s	0	Optional; number of commands to skip if the error value set by the terminal does not equal the value specified by "a" parameter
a	0	Optional; code identifying the type of data capture error; the default value is 0, no error; error code options include: 0 no error; previous operation performed (skip if there is an error) 1 insufficient memory available to perform operation (skip if sufficient memory exists) 2 invalid batch or none selected (skip if batch is valid) 3 requested detail record does not exist (skip if record exists)

*F - Detect Data Capture Errors

Example:	Command	Operation
	; This routine is used to select a batch to read or update. If the batch does ; not exist an error will be reported.	
	72=BATCH NOT FOUND	
	285\$	
	B.3	; Select work buffer 3
	G	; Clear buffer
	R'BATCH'	; Append "BATCH" to buffer
	A50	; Append batch number to buffer
	*B3	; Select batch with header matching ; destination buffer contents
	*F2.2	; If batch selected skip 2 else
	P72	; Display "BATCH NOT FOUND"
	*K1	; Abort and leave the current display
*Fn.0 Example:	41=DUPLICATE BATCH	
	42=BATCH CREATED	
	150\$; *F example
	B.5	; Select destination buffer
	G	; Clear buffer
	R'Test Batch'	; Append batch header
	*A	; Open a batch with header 'TEST BATCH'
	*F1.0	; Skip if an error occurred
	L155	; Link to control string to continue with batch
	*G1	; if an error occurred, beep
	P41	; Display 'DUPLICATE BATCH'
	*K1	; Abort, leaving this display
	155\$	
	P42	; Display 'BATCH CREATED'

+F Enable/Disable Response ACK

Description: Enables/disables the ACK (acknowledgement) response and offers the options of sending the ACK over the modem immediately.

See Also:	Command	Description
	+D	Tone Dial
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Communications Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported: **Terminal** **Special Conditions**

PNC 330	None
ONC 340	Not available
XL	Available on versions 2.4 or greater
TRANZ 330	Available on versions 2.0 or greater
TRANZ 330 (202)	Not available
TRANZ 340	Not available
TRANZ 380	None

Command Format:

+Fa

+F - Enable/Disable Response ACK

Parameters:

Parameters	Default Value	Description
a	0	Optional; options for this parameter are: 0 enable response ACK 1 disable response ACK 5 send ACK over the modem line immediately.

Examples:

Command	Operation
; Routine will analyze a close response message. 164\$ B2 O I3.2.'ZB' +F5 P296 *K1 I7.2.'ZC' +F5 *W3 *K3 *L325 G P182 L239	; Select source buffer ; Move extraction pointer 1 ; If Aborted ; Send an ACK now! ; Say, "ABORT CLOSING" ; And quit ; If okay ; Send an ACK now! ; Wait for the Network to process the ACK ; Drop out of multi-transaction ; Clear Totals, Clear batch ; Clear buffer ; Say, "CLOSE OK" ; Link to routine to complete processing

G Clear Destination Buffer

Description: Deletes all data from the destination buffer.

See Also: **Command** **Description**

D	Delete Characters from Buffer
---	-------------------------------

Category: Buffer Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer is cleared
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Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

G

Parameters:

Parameter	Default Value	Description
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(The "G" command has no parameters)

Example: **Command** **Operation**

110\$	
B.5	; Selects buffer 5 as destination buffer
G	; Clears the contents of the destination
	; buffer (buffer 5)

***G - Terminal Beep**

***G Terminal Beep**

Description: Causes the terminal to give a normal or an error key beep.

Category: Outputs and Data Display

Buffer Status:	Source Buffer	Destination Buffer
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No change	No change
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Terminals Supported:	Terminal	Special Conditions
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PNC 330/340	None
XL	*G2 available on versions 2.80 and greater
TRANZ 330	None
TRANZ 330 (202)	*G2 available on versions 2.1 and greater
TRANZ 340	*G2 available on versions 2.1 and greater
TRANZ 380	None

Command Format:

***Ga**

Parameters:	Parameter	Default Value	Description
a	0	Optional; options include: 0 normal beep - short, high tone 1 error beep - long, low tone 2 normal beep - no beep if turned off (location 9)	

Example:	Command	Operation
	113\$ F71 *G1	; Display "NOT FOUND" and beep to get user's ; attention. The following shows this *G ; command used with the F command: ; Display "NOT FOUND" ; Beep to get the users attention

+G Append Detail Record into Batch

Description: Appends a detail record to the selected batch or inserts a detail record in front of the selected record.
You must use *B to select a batch before using +G.

Note: Refer to Appendix D in the TRANZ 380 Reference Manual for execution details.

See Also:	Command	Description
	*A	Create/Open Batch
	*B	Select Batch
	*C	Copy Buffer to Batch
	*D	Delete Batch Information
	*E	Copy Batch Detail to Buffer
	*F	Detect Data Capture Errors
Category:	Data Capture and Batch Functions	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"s" not available
	XL	Not available
	TRANZ 330/340	Available on versions 2.1 or greater, "s" not available
	TRANZ 380	"s" available on versions 1.1 or greater

Command Format:

+Ga.S

+G - Append Detail Record into Batch

Parameters:

Parameters	Default Value	Description
a	0	Optional; options for this parameter are: 0 append record to selected batch 1 insert record in front of selected record
s	0	Optional; number of commands to skip if the operation is successful.

Examples:

Command	Operation
; This routine is to add a record to the preselected batch. It also	
; checks for an error of not enough memory to add a record.	
73=OUT OF MEMORY	
289\$	
+G	; Add the record to the batch with the contents ; that was built in the current destination buffer
*F2.1	; If not out of memory skip 2 else
P73	; Display "OUT OF MEMORY"
*K1	; Abort and leave the current display

H Search for String in the Source Buffer

Description: Searches for a string or character constant in the source buffer. When searching, the terminal looks from the extraction pointer to the end of the source buffer.
If the terminal finds the string or constant, it moves the extraction pointer to the first character. If no string or constant is found, the extraction pointer retains its original position.

See Also:	Command	Description
	B	Select Buffers
	D	Delete Characters from Buffer
	G	Clear Destination
	+J	Buffer Modification
	O	Move Extraction Pointer

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	Pointer is in front of found string, else no change; buffer is read	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

Hs.c1.j.c2

H - Search for String in the Source Buffer

Parameters:	Parameter	Default Value	Description
	s	0	Optional; number of commands to skip if character or string is not found; the "s" parameter can be positive or negative
	c1	28/FS	Optional; string or constant to search for; can be a literal string, enclosed in single quotes, or a decimal value of an ASCII character; default value: 28, decimal constant for an ASCII field separator
	j	to end	Optional; maximum number of characters to search forward; default is 0, causing the search to continue to the end of the buffer string. If not found, the data extraction pointer is preserved.
	c2	0	Optional; decimal value of an end sentinel; if the terminal encounters the "c2" parameter at or before the "c1" value, the search stops and the extraction pointer remains at its original position
Examples:	Command	Operation	
	;	This routine is called after we receive a response message back from the host and we want to extract the display message found between the second and third field separator and the approval number between the fourth and fifth field separator.	
	180\$		
	B.2	; Select receive buffer containing host response	
	U195	; Save the entire host response	
	B2.3	; Select the receive buffer as the source buffer and 3 as the destination buffer	
	G	; Clear destination buffer	
	U49	; Clear the display message	
	H	; Find first field separator in the host response	
	O	; Move the extraction pointer by 1	
	H	; Find second field separator in host response	
	X.28	; Copy display message up to third field separator	
	U49	; Save the display message	
	O	; Move the extraction pointer by 1	
	H	; Find fourth field separator in the host response	
	G	; Clear destination buffer	
	X.28	; Copy approval number up to fifth field separator	
	U50	; Save the approval number	

***H Encrypt PIN and Account Number**

Description: Gives the terminal the ability to instruct a PIN Pad to encrypt personal identification numbers (PINs) and account numbers using DES encryption in compliance with the ANSI 9.8 standard. Also sends the PIN Pad the command to accept a PIN entry and return it to the terminal.

When the terminal executes the *H command, it:

- checks to see if the PIN Pad is connected,
- sends the account data, the encrypting working key (stored in location 016) and the Mkey pointer to the PIN Pad,
- instructs the PIN Pad to prompt for PIN entry,
- gets the PIN from the PIN Pad keyboard,
- combines the account number and PIN to create the formatted PIN block,
- decrypts the working key with the master key,
- encrypts the formatted PIN block with the working key using the DES encryption standards,
- sends the encrypted PIN block back to the TRANZ
- moves the encrypted PIN block to the destination buffer.

*Note: The "i" and "j" parameters for the *H command will only work with PIN Pad firmware 1C or higher. Also verify that the PIN Pad is selected as the DIN 6 peripheral in location 970/0970 (970/0970 = 2).*

See Also:	Command	Description
	+H	Wait for PIN
	+T	Send over DIN 6
	+U	Set DIN 6 Parameters

Category: Encryption

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

***H - Encrypt PIN and Account Number**

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340 XL	Value "0" for parameter "a" not available "a" parameter not available; command not available on versions 2.4 or greater
	TRANZ 330/340	Value of "0" for parameter "a" (internal PIN encryption) not available on versions 2.30 or greater
	TRANZ 380	Value of "0" for parameter "a" not available

Command Format:

***Hi.j.a**

Parameters:

Parameter	Default Value	Description
i	4	Optional; the minimum number of PIN digits; range 4-12
j	12	Optional; the maximum number of PIN digits; range 4-12
a	2	Required; this parameter specifies that encryption and account number entry is from an external PIN Pad. Select one of the options as described below and on the next page.

Warning: Be careful when specifying the "i" and "j" parameters as the terminal will not stop you from specifying a minimum number of PIN digits that is greater than the maximum number allowed.

If a = 0 (PIN and account number from TRANZ terminal)

Note: This parameter is not available.

	Source Buffer	Destination Buffer
Before *H Command	Account Number	---
After *H Command	Account Number	Encrypted PIN Block

If a = 1 (PIN from PIN Pad; account number from TRANZ)

	Source Buffer	Destination Buffer
Before *H Command	Account Number	Amount
After *H Command	Account Number	Encrypted PIN Block

If a = 2 (PIN and account number from PIN Pad 201 only)

	Source Buffer	Destination Buffer
Before *H Command	---	Amount
After *H Command	Card Data	Encrypted PIN Block

- Command Requirements:
- Input**
- Source buffer should only contain the account number, including checkdigit;
 - Destination buffer contains amount of sale;
 - Location 016 must contain the encrypted working key and master key pointer in the following format:

016=nnnnnnnnnnnnnnnnn-x

where:

n = encrypted working key hexadecimal digit
- = mandatory data separator
x = master key pointer (0-9).

Output

- Source buffer contains the account number;
- Destination buffer contains the encrypted PIN block.

Warning: The command deletes all the data in the destination buffer, then appends the encryption block.

Example 1:	Command	Operation
	;This routine gets encrypted PIN Block from PIN Pad 101	
	050\$	
	B3.4	; Source = buffer 3 (has the account number)
		; Destination = buffer 4 (has sale amount)
	*H..1	; Get PIN from PIN Pad; 4-12 digits, combine
		; with the account no. (in buffer 3 - source)
		; and create the encrypted PIN block,
		; move the encrypted PIN block to buffer 4
	B4.1	; Source = buffer 4 (encrypted PIN block)
		; Destination = transmit buffer
	X	; Append the encrypted PIN block to the
		; Transmit buffer
	*M	; Return
Example 2	;This routine gets encrypted PIN Block from PIN Pad 201	
	B1.2	; Select source = buff 1, dest = buff 2
	G	; Clear destination buffer
	R'10.00'	; Amount
	*H..2	; PIN Pad prompts to slide card and for PIN entry
		; displays 'PLEASE WAIT ...'
	B.1	; Select dest = buff 1
	*J1	; Display leftmost side of buffer
	V	; Display Account number and allow scrolling
		; until the user presses [ENTER]
	B.2	; Select dest = buff 2
	V.2.2	; Display the encrypted PIN block
	*K1	; Abort, leaving the display as is

+H - Wait for Encrypted Block from PIN Pad

+H Wait for Encrypted Block from PIN Pad

Description: Instructs the terminal to wait for an encrypted PIN Block from the PIN Pad. This transferral of PIN Block is sent via the PIN Pad using a type 71 message only. When the command is completed, the encrypted PIN will be in the destination buffer.

See Also:	Command	Description
	*H	Encrypt PIN
	+T	Send over DIN 6
	+U	Set DIN 6 Parameters
Category:	Encryption	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Encrypted PIN block appended to data

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	Not available
	TRANZ 330/340	Available in versions 2.1 or greater
	TRANZ 380	None

Command Format:

+Hs

Parameters:	Parameter	Default Value	Description
	s	0	Number of commands to skip if an EOT is received

Example:	Command	Operation
	50=CUST TERMINATED;	
	53\$	
		;..
		;.. (generate PIN request message)
		;..
	+T1	; Send PIN request to PIN Pad
	+H1	; Wait for PIN block; skip 1 if user
		; pressed [CLEAR] on PIN Pad
	*M	; Got the PIN block so return to calling
		; subroutine
	P50	; Display CUST TERMINATED
	*K1	; Abort

Comparison Operator

Description: Does a byte-for-byte comparison of the value of a string in the source buffer (pointed to by the extraction pointer) to the value of the string or constant specified by the "c" parameter.

Note: If the extraction pointer points to an empty string, it causes the "skip" to always occur. A positive command skips x commands forward and puts its pointer on the next command to be executed; a negative command skips x commands backwards and puts its pointer on the current command to be executed.

See Also:	Command	Description
	+A	Compare Variable
	+C	Buffer Comparison
Category:		Process and Flow Control
Buffer Status:	Source Buffer	Destination Buffer
	Pointer does not move Buffer read	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340 XL TRANZ 330/340/380	None None None

Command Format:

I.S.a.C

Parameters:	Parameter	Default Value	Description
	s	0	Optional; number of commands to skip when the comparison specified by the "a" parameter is true; "s" parameter may be a positive or a negative number
	a	0	Optional; a comparison code indicating the type of comparison to be made; the default is 0 (unconditional jump); other comparison options are: 0 Unconditional jump (default) 1 Skip if equal 2 Skip if not equal 3 Skip if less than specified character 4 Skip if greater than specified character 5 Skip if single transaction 6 Skip if not first pass of a multi-transaction session with a host 7 Decrement variable pointed to by "c" parameter and skip if the variable is not zero
	c	28	Optional; a literal string or decimal value of ASCII character; this string will be compared to data in source buffer. Default value is 28 (field separator, FS), the decimal constant for an ASCII field separator.

Example:	Command	Operation
	; This routine checks to see if anyone is logged on: a value other than "00" in memory location 80 would indicate someone is logged on 170=MUST LOGON FIRST 145\$ B5.5 ; Select source and destination buffer 5 G ; Clear destination buffer A80.2 ; Append logon ID if empty, skip 2 commands I1.1.'00' ; If zero skip 1, because we aren't logged on, ; else return *M ; Return we have someone logged on P170 ; Display "MUST LOGON FIRST" *K1 ; Abort and leave error display at idle state	
	; This routine counts down from 7 to 0 31\$ B.5 ; Select work buffer *N#2.7 ; Set variable 2 to 7 G ; Clear buffer +Q#2 ; Append variable 2 to buffer V.2.2 ; View buffer with 1 second delay I-3.7.#2 ; Decrement variable 2, skip back if value is ; non-zero	

*I - Character I/O Over the DIN 8 Port

*I Character I/O Over the DIN 8 Port

Description: Provides character Input/Output via the 8-pin DIN RS-232 port on the rear of the PNC/TRANZ terminal.

Typical input/output messages include pass characters which are coded in ROM and represent special flag characters used in data communication. A pass character is only valid when parameter "a" = 7. When received, the terminal processes and then acts upon its represented message. Valid pass characters include the following:

Character	Hex	Description
EOT	04h	End of Transmission
ENQ	05h	Enquire
ACK	06h	Acknowledgement
NAK	15h	No acknowledgement
CR	0Dh	Carriage return
vACK	07h	VISA ACK 1
vWACK	11h	Wait ACK
vWAIT	12h	VISA wait

Special host communication characters used when logging into several different hosts and networks:

@	40h
:	3Ah
=	3Dh
~	7Eh
XON	11h

*Note: When set in PNC mode, the PNC 330 and 340 do not support the *I command.*

See Also: **Command** **Description**

N	Send Buffer to Printer
*R	Specify Device, Speed and Format
+R	Set RS-232

Category: Communications Control

Buffer Status: **Source Buffer** **Destination Buffer**

No change	If received, buffer updated
-----------	-----------------------------

Terminals Supported:

Terminal	Special Conditions
PNC 330/340	Not supported when in PNC mode
XL	Available on 2.8 or greater
TRANZ 330/340	Available on 2.1 or greater
TRANZ 330 (202)	Available on 2.1 or greater
TRANZ 380	None

Command Format:

***la.t.s.n**

Parameters:

Parameter	Default Value	Description
a	0	Optional; Options for this parameter are: Transmitting data 0 send transmit buffer 1 append termination character TERMCHAR (set with *P command) and LRC, then send transmit buffer Receiving data 5 wait for number of characters specified in "n" parameter to be received, append to destination buffer 6 wait for one character or packet to be received, append it to destination buffer; if STX is received, wait for packet; LRC check is done and a NAK will be sent upon a bad packet 7 wait for pass character or packet, retransmit last data if NAK is received; append receive character or packet to destination buffer; LRC check is done and a NAK will be sent upon a bad packet. (See also *P command for specifying pass characters.)
t	0	Optional; timeout period in seconds (receive only); 0 = wait indefinitely 1-255 = number of seconds to wait If the unit times out, the destination buffer remains unchanged
s	0	Optional; number of commands to skip if requested data is received (receive data only)
n	1	Optional; minimum number of characters to wait before appending characters to destination buffer (only if "a" parameter = 5) (receive data only)

***I - Character I/O Over the DIN 8 Port**

Example:	Command	Operation
	323\$	
	; Enter loop here to wait for next audit request without sending special audit	
	; ACK.	
	B2.2	; Select B2 (receive buffer)
	G	; Clear B2
	+I8.240.1	; Wait for message from controller
	I-3	; If none received in timeout, wait again
	*R9.2	; Set no handshake on RS232
	B.1	; Select Dest = B1 (xmit buffer)
	G	; Clear B1
	R17	; 17 = XON char (select char)
	*I	; Send out RS232
	*W1	; Pause 1 second
	*R9.1	; Set handshake

+I Character I/O Over the Modem Port

Description: The "+I" command provides Input/Output over the modem port. (For dial terminals only. See "+I" LAN Send and Receive for polled terminals.)
Typical input/output messages include pass characters which are coded in ROM and represent special flag characters used in data communication. A pass character is only valid when parameter "a" = 7. When received, the terminal processes and then acts upon its represented message. If error, an error code is appended to the destination buffer. See page 2-16 for a list of error codes. Valid pass characters include the following:

Character	Hex	Description
EOT	04h	End of Transmission
ENQ	05h	Enquire
ACK	06h	Acknowledgement
NAK	15h	No acknowledgement
CR	0Dh	Carriage return
vACK	07h	VISA ACK 1
vWACK	11h	Wait ACK
vWAIT	12h	VISA wait

Character	**Hex**	**Description**
EOT	04h	End of Transmission
ENQ	05h	Enquire
ACK	06h	Acknowledgement
NAK	15h	No acknowledgement
CR	0Dh	Carriage return
vACK	07h	VISA ACK 1
vWACK	11h	Wait ACK
vWAIT	12h	VISA wait

Special host communication characters used when logging into several different hosts and networks:

@	40h
:	3Ah
=	3Dh
~	7Eh
XON	11h

See Also: **Command** **Description**

+D	Tone Dial
+F	Response ACK
+K	Carrier Control
+M	Set Modem Parameters
*P	Specify Characters
*R	Specify Device, Speed and Format
S	Dial Phone Number
*T	Specify Timeouts
*V	Append Phone Status
+X	Transmit Data to Network
+Y	Receive Data from Network

Category: Communications Control

Buffer Status: **Source Buffer** **Destination Buffer**

No change	If received, buffer updated
-----------	-----------------------------

+I - Character I/O Over the Modem Port

Terminals Supported:

Terminal	Special Conditions
PNC 330	None
PNC 340	Not available—see +I LAN Send and Receive
XL	Available on versions 2.4 or greater
TRANZ 330	Available on versions 1.3 or greater
TRANZ 330 (202)	Not available
TRANZ 340	Not available—see +I LAN Send and Receive
TRANZ 380	None

Command Format:

+la.t.s.n

Parameters:

Parameter	Default Value	Description
a	0	Optional; options for this parameter are: Transmitting Data: 0 send transmit buffer 1 append termination character TERMCHAR (set with *P command), and LRC, then send transmit buffer Receiving Data: 5 wait to receive the number of characters specified in "n" parameter, then append it to the receive buffer 6 wait for one character/packet to be received, then append it to receive buffer if you receive a STX, wait for complete packet; LRC check is done and a NAK will be sent upon a bad packet 7 wait for pass character or packet, retransmit last data if NAK received, then append receive character or packet to the receive buffer; LRC check is done; a NAK will be sent upon a bad packet (See also *I Command for pass characters.)
t	0	Optional; timeout period in seconds, (receive only) 0 = wait indefinitely 1-255 = number of seconds to wait. If the unit times out, the destination buffer remains unchanged.
s	0	Optional; number of commands to skip if requested data is received (receive only)
n	1	Optional; minimum number of characters to wait for (only if "a" parameter = 5) (receive data only)

Examples:	Command	Operation
	+I	; Send transmit buffer to the modem.
	+I5.10.3.4	; Allow 10 seconds to receive four characters from ; the modem. Skip three commands if four characters ; are received within 10 seconds.

Refer to Appendix D for communication examples using this command.

+I - LAN Send and Receive

+I LAN Send and Receive

Description: Sends and receives data over the LAN (local area network). If the send or receive fails for some reason, a one-digit error code will be appended to the destination buffer.

Receive Error Codes:

Code	Description
-------------	--------------------

1	timed out
2	[CLEAR] key pressed
3	receive error occurred
4	not used

Send Error Codes:

Code	Description
-------------	--------------------

5	timed out
6	[CLEAR] key pressed
7	transmit error occurred
8	timed out waiting for ZLTP ACK

See Also: **Command** **Description**

*T	Specify Communications Timeout
*V	Append LAN Status Code

Category: Communications Control

Terminals Supported: **Terminal** **Special Conditions**

PNC 330	Not available — see previous command
PNC 340	None
XL	Not available — see previous command
TRANZ 330	Not available — see previous command
TRANZ 330 (202)	Not available
TRANZ 340	Available on versions 2.1 or greater see parameter "a", option 8
TRANZ 380	Not available

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer updated
-----------	----------------

Command Format:

+Ia.t.s.n

Parameters:

Parameter	Default Value	Description
a	0	Optional; options for this parameter are: 0 send message in transmit buffer to controller 7 clear operating system buffer, wait for LAN controller data, put it in the receive buffer and clear operating system buffer. 8 wait for LAN controller data before clearing operating system buffer, then put it in the receive buffer.
t	30 for TX 45 for RX	Optional; timeout period in seconds, (receive only) 0 30-second timeout for transmit 0 45-second timeout for receive or timeout set with *T command 1-255 number of seconds to wait. If unit times out, the destination buffer remains unchanged.
s	0	Optional; number of commands to skip if communication is successful
n	1	Optional; transmit only 0 no ZLTP ACK requested 1 ZLTP ACK requested

Examples:

Command	Operation
113\$	
B.1	; Destination = transmit buffer
G	; Clear transmit buffer
R"TEST"	; Append "test" to transmit buffer
+I0	; Send the message "TEST" to the LAN ; Controller

J

Append Clock Data to Destination Buffer

Description: Appends clock data to the destination buffer and allows you to set the real-time clock chip using data from the destination buffer or to read clock data from the clock chip.

See Also: **Command** **Description**

A	Append from Memory Location
Q	Append Write Control Character
+Q	Append Variable to Buffer
R	Append Constant
+V	Append Sign On Message
X	Append from Source
Y	Append Non-Blank Memory Location

Category: Buffer Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change Buffer read or updated

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:



Parameters:	Parameter	Default Value	Description
	n	none	Required; the parameter is either the number 1 or a command string. See the following text.
			<ul style="list-style-type: none">Enter a "1" to set the real-time clock chip to the time specified in the destination buffer. The format of the destination buffer is:
			<ul style="list-style-type: none">WYYMMDDHHMMSS
	W	day of week (0=Sunday, 1=Monday, 2=Tuesday, etc.)	
	YY	year (19YY)	
	MM	month (01=January, 02=February, 03=March, etc.)	
	DD	day of the month (01 through 31)	
	HH	hour (24-hour clock; 1 p.m.=13)	
	MM	minutes (00 through 59)	
	SS	seconds (00 through 59)	

- To append clock data to the destination buffer, enter a command string specifying the format of the data to be read from the calendar/clock chip. The string must be enclosed in single quotes, and may contain letters, spaces, symbols and numbers. All characters in the string are literal and will be displayed exactly as written, except for the letters which are replaced by clock data according to the "Clock Data Table." See the following examples and the "Clock Data Table".

Clock Data Table

Code	Clock Data	Examples
A	2-digit year	1991 = "91" - (00 ... 99)
B	2-digit month	July = "07" - (01 ... 12)
C	2-digit date	1 through 31
D	2-digit hours	12-hour clock 1 p.m.= "01"
E	2-digit minutes	00 through 59
F	2-digit seconds	00 through 59
G	A or P	a.m. = "A" p.m. = "P" (12-hour only)
H	4-digit year	1991 = "1991" - (1980 ... 2079)
I	3-letter month	January = "JAN"
J	Full month	January = "JANUARY"
K	2-digit hours	24-hour clock 1 a.m.= "01" 1 p.m.= "13"
L	3-letter day	Monday = "MON"
M	"M"	adds "M" to a.m. and p.m. (see G)
N	Full day	Monday = "MONDAY"
O	colon (:)	Colon for time (8:30 14:22:13)
P	equal sign (=)	Equal sign instead of colon (8=30 14=22=13)
Q	numeric day	Sunday=0 Monday=1 Tuesday=2 etc.

TRANZ 380, TRANZ 330 3.60+ and PNC 330 only:

R	0 - 6 digits	Allow leading zeros (01 Jan 91)
S	0 - 6 digits	Suppress leading zeros (1 JAN 91)
T	blinking colon	(':' or '=')
U	1 character	append next char ('UHUI' DOE = HI 10:30)

Examples:

Command	Operation
; This routine will capture the transaction start date and time for	
; later use in the format "YYMMDDHHMMSS"	
158\$	
B.4	; Select destination buffer 4
G	; Clear destination buffer
J'ABCDEF'	; Append date/time in format ; "YYMMDDHHMMSS"
U81	; Store date/time

J - Append Clock Data to Destination Buffer

Examples: (continued)	Command	Operation
	159\$; J1 example
	B.5	; Select a work buffer
	G	; Clear it
	R'0910101010000'	; Get ready to set clock to Sunday, ; Jan 01, 1991, 1:00:00 A.M.
	J1	; Set the real-time clock chip

Note: The '.' command, when entered in memory location 030 (idle prompt), operates the same as the "J" command. If you enter '.' as the first character in memory location 030, it lets you set the idle prompt as a date/time display.

***J Justify Display**

Description: Determines how the terminal justifies the data displayed on the screen. When the data is longer than 16 characters (the length of the display screen), the "*J" command determines whether the leftmost or rightmost characters are displayed.

See Also:	Command	Description
	F	Display Fixed Prompt
	P	Display Custom Prompt
	V	Display Buffer

Category: Outputs and Data Display

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:



Parameters:	Parameter	Default Value	Description
	a	0	Optional; the options for this parameter are as follows: 0 display rightmost characters 1 display leftmost characters

***J - Justify Display**

Example:	Command	Operation
		; This routine is called after we receive a response message back from host
		; and we want to extract the display message and display it. Display
		; message in host response is after the second field separator. The response
		; is variable length and longer than 16 characters. Message is right-justified
		; so merchant will know message is longer than 16 characters.
178\$	B.2	; Select receive buffer which contains the
		; host response
	U190	; Save the entire host response
	B2.3	; Select the receive buffer as the source
		; buffer and 3 as the destination buffer
	H	; Find the first field separator in the host
		; response
	O	; Move the extraction pointer by 1
	H	; Find the second field separator in the
		; host response
	O	; Move the extraction pointer by 1
	X.28	; Copy up to the next field separator
	*J	; Right justify the display
	V.2	; Display message in the destination buffer
	*K1	; Abort and leave the current display up

+J Buffer Modification

Description: Modifies the source and destination buffers to remove periods or commas, to add the '\$' sign and decimal point and convert control characters to printable characters. This command also computes logical AND, OR and XOR of data.

See Also:	Command	Description
	B	Select Buffers
	D	Delete Characters from Buffer
	G	Clear Destination
	H	Search for String
	O	Move Extraction Pointer
	+S	Get Buffer Size
	U	Copy Buffer to Memory Location
	V	Display Buffer
	Z	Pad Destination Buffer

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	Updates depending on parameter option; pointer at end of data	Updates buffer

Terminals Supported: Terminal Special Conditions

PNC 330/340	None
XL	Available on 2.6 and greater
TRANZ 330/340	Available on versions 2.1 or greater
TRANZ 380	None

Command Format:

+Ja

+J - Buffer Modification

Parameters:	Parameter	Default Value	Description
	a	0	Optional; options for this parameter are: 0 append source buffer to destination buffer; remove periods or commas 1 append source buffer to destination buffer; add "\$" and decimal point 2 append source buffer to destination buffer; convert control characters to printable characters 3 copy source buffer to destination buffer, using mask in destination buffer 4 logically AND data in the source and destination buffers; put results in the destination buffer 5 logically OR data in the source and destination buffers; put the results in the destination buffer 6 logically XOR data in the source and destination buffers; put the results in the destination buffer

Example 1:	Command	Operation
	; This routine will display the response for an offline approval. 610\$ B.5 ; Select destination buffer G ; Clear destination buffer A5 ; Append reference number Z6 ; Pad up to 6 characters with spaces, left justify B.3 ; Select destination buffer G ; Clear destination buffer A82 ; Append unformatted amount B3.5 ; Select source and destination buffer +J1 ; Copy and format amount B4 ; Select source buffer O2 ; Move extraction pointer 2 places X2 ; Copy the card type A153 ; Append transaction type R32 ; Void indicator....."V" or " " Z17 ; Pad up to 17 characters with spaces, ; left justified A80 ; Append account number Z33 ; Pad up to 33 characters with spaces, ; left justified *J1 ; Left-justify V.2 ; Display the destination buffer	

Example 2:	Command	Operation
	160\$; +J3 example
	B.5	; Select 1st buffer
	G	; Clear it
	R'1234567'	; Append data
	B5.4	; Move data to source, select new destination
	G	; Clear new destination buffer
	R '---'	; Append mask to new destination buffer
	+J3	; Copy source to destination
		; The destination buffer now contains '1-3-5-7'.
Example 3:	Command	Operation
	161\$; +J2 example
	B.3	; Select 1st buffer
	G	; Clear it
	R2	; Append <STX>
	R'4017485948323345'	; Append account
	R	; Append <FS>
	R'1299'	; Append expiration date
	R	; Append <FS>
	R'2500'	; Append amount
	R3	; Append <ETX>
	B3.4	; Move packet to source, ; get new destination
	G	; Clear new destination buffer
	+J2	; Copy packet to destination, ; convert control ; characters to printable ; characters
	N2	; Send to printer with two ; <CR><LF>s
	W	; Wait for printing to complete
	*K	; Abort the control string ; The message printed out: ; ^B4017485948323345^/1299^ ; /2500^C^M^J^M^J

Note: When using +J1 with an amount less than \$1.00, it will *not* include a leading zero (99 will convert to \$.99, not \$0.99).

K - Input from Keypad Only

K

Input from Keypad Only

Description: Causes the terminal to accept input from the keypad only, place a field separator after the entered data, except when input type flag 4 is selected. The data will be appended to the destination buffer. If the user swipes a card through the cardreader, the terminal beeps, displays KEYBOARD ONLY for three seconds and returns to the idle prompt. When the user enters a keypress, the cardreader buffer is cleared.

The "K4" command can accept negative amount entries in XL version 2.02 and higher, PNC 330/340, TRANZ 330 1.3 and higher, and TRANZ 380. Press the [*] key before entering the first digit of the amount. The negative sign will be displayed on the left side of the amount.

Note: If input type flag 4 is selected and a field separator is desired, use the "R" command to append a field separator to the end of the entered data.

See Also:	Command	Description
	E	Input from Card Reader or Keypad
	+E	Input Variable Decimal Point
	M	Input from Card Reader Only
	*U	Input from Bar Code Reader
	*Y	Check Input Devices

Category: Data Entry

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	"s" and "i" parameters are not available
	TRANZ 330/340	"i" parameter available on version 2.1 or greater
	TRANZ 380	None

Command Format:

Ka.j.S.i

Parameters:

Parameter	Default Value	Description
a	3	Optional; input type flag; identifies type of editing criteria; default flag is 3, alphanumeric; other options: Input Type Flag 1 alphanumeric characters 2 numeric 3 alphanumeric characters 4 numbers with two forced decimal places (for money); the decimal is added automatically; the default field length is 10 characters, with a maximum length of 15, minimum digits = 4; if null entry occurs, "0.00" is appended to destination buffer (or ".00" in XL version 2.4) 5 alphanumeric; hidden entry (*s displayed) 6 numeric; hidden entry (*s displayed) 7 alphanumeric; hidden entry; password required; entered data not appended to destination buffer; if password entered incorrectly, terminal beeps and aborts operation
j	60	Optional; the maximum number of input characters the terminal will accept from the keypad; default for input type flags 1,2,3,5,6 and 7 is 60 chars; default for input type 4 is 10 chars; maximum length for amount data is 15.
s	0	Optional; number of commands to skip after a NULL entry from keypad. NULL entry occurs if you press [ENTER] without entering data. Valid only for keyboard entry.
i	0	Optional; minimum number input chars from keypad. Valid only for keyboard entry. <i>Note: If "i" is greater than "j", "i" will be set to zero.</i>

Example:

Command

Operation

; This routine will get the 2-decimal place amount from the merchant.
 161\$
 B.4 ; Select destination buffer 4
 G ; Clear destination buffer
 F30 ; Display fixed prompt "ENTER AMOUNT"
 K4 ; Accept dollar amount
 U82 ; Store amount

K - Input from Keypad Only

Notes: When using a data type of 4 (amount):

- There is no null entry. If the user presses [FUNC/ENTER] without entering data, 0.00 is appended to the destination buffer.
- You can use the [*] key to toggle between negative and positive values. However, in TRANZ 330 EPROMs less than 3.60, if you enter the maximum number of characters (15), you will corrupt the last digit if you try to toggle to negative.
- There is no minimum number of input characters.

For EPROMs with 10-digit math, the "A" parameter is set to 4 (amount), and parameter "J" is left as the default, maximum input is 10 digits. The "J" parameter can be set to a maximum of 15 characters. Maximum input for 15-digit EPROMs with the same parameter settings is 15 characters.

***K Abort Process, String or Transaction**

Description: Causes the terminal to abort or terminate a process.

*Note: "*K" clears all system buffers (not source and destination buffers) and stops the printing process if characters remain in the printer buffer. Issue a "W" command to wait for the printer buffer to empty prior to the "*K".*

See Also: **Command** **Description**

*M	Explicit Return
----	-----------------

Category: Process and Flow Control

Buffer Status: **Source Buffer** **Destination Buffer**

Reset	Reset
-------	-------

Terminals Supported: **Terminal** **Special Conditions**

PNC 330	None
PNC 340	"*K2" and "*K3" not available
XL	None
TRANZ 330	None
TRANZ 330 (202)	"*K2" and "*K3" not available
TRANZ 340	"*K2" and "*K3" not available
TRANZ 380	None

Command Format:

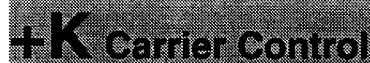


Parameters: **Parameter** **Default Value** **Description**

a	0	Optional; code telling terminal what to do after terminating a process: 0 display the idle prompt (ABORTD) 1 leave existing display as is (ABORT) 2 hang up phone, leave multi-transaction enabled and continue executing the control string
	3	hang up phone, turn off multi-transaction (reset to single transaction) and continue executing control string

***K - Abort Process, String or Transaction**

Example:	Command	Operation
	; This routine clears batch and upon completion aborts and keeps current display.	
354\$		
	B.5	; Select buffer 5
	G	; Clear 5
	U40	; Clear batch counter
	F14	; Display 'BATCH CLEARED'
	*W2	; Wait for 2 seconds
	R49	; Append a 1
	*B3	; Open as the current batch
	*D	; Delete the entire batch
	+L1	; Unlock keyboard
	*K1	; Finish and remain on display



Description: Raises, drops carrier or waits for incoming carrier.

Note: Option 1 of parameter "a" (drop carrier) also clears the circular modem receive buffer.

Option 6 of parameter "a" debounces carrier detect — requires the carrier detect signal be stable over a predefined period of time (200-400 milliseconds) in case the terminal sees an instantaneous carrier detect due to telephone line noise or a malfunctioning host modem. The moment of silence applies primarily to 1200 baud Bell 212A or CCITT V.22 communications protocol and requires that carrier (or unscrambled modem MARK) be present for a predefined period of time (500 milliseconds) with no data transmission. Any data transmission detected during this time resets the timer. If a continuous moment of silence does not occur within 12 seconds, the terminal will abort the control string with an error message CANNOT CONNECT.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+M	Set Modem Parameters
	*P	Specify Characters
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network
Category:	Communication Control	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330	None
	PNC 340	Not available
	XL	Available on versions 2.4 or greater
	TRANZ 330	Available on versions 1.3 or greater
	TRANZ 330 (202)	Not available
	TRANZ 340	Not available
	TRANZ 380	None

+K - Carrier Control

Command Format:

+Ka.S

Parameters:

Parameter	Default Value	Description
a	0	Optional; options for this parameter are: 0 raise the carrier 1 drop the carrier 2 raise answer tone 5 wait for debounced carrier detect (samples for 200 ms) 6 wait for debounced carrier detect with 500ms moment of silence 7 skip "s" parameter if carrier detect (samples 1 tick)
s	0	Optional; number of commands to skip if "a"=7

Examples:

Command	Operation
; Go off hook and raise carrier. S3 ; go off hook +K ; raise carrier	
; Go off hook and wait for carrier S3 ; go off hook +K5 ; wait for carrier	

Refer to Appendix D for communication examples using this command.

L Link Control Strings

Description: When a control string exceeds the maximum number of characters allowed for a memory location, you can break it up and store it in several memory locations then use the "L" command to link these locations together. Use the "L" command at each break point to identify the memory location containing the next portion of the control string. Remember to count each character in the control string, including periods and commas. When breaking up a control string, place the break on or before the 116th character (the 56th character in TRANZ version prior to 2.1, XL versions prior to 2.4) as the "L" command requires four characters (Lnnn where nnn=the next memory location).

Note: You can use the "L" command anywhere in the control string to link to another control string.

See Also:	Command	Description
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*L	Call Subroutine
*M	Explicit Return

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
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No change	No change
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Terminals Supported:

Terminal	Special Conditions
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PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

Parameters:

Parameter	Default Value	Description
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m	re-execute	Optional; memory location containing next portion of the control string; if "m" parameter is not specified, the terminal will re-execute the control string in the current memory location
---	------------	--

L - Link Control Strings

Examples:	Command	Operation
	; This routine prompts for selection to add, update, or delete a supervisor ; password and link to the appropriate routine based on selection.	
680\$		
	B3.3	; Select source and destination buffer 3
	G	; Clear destination buffer
	P690	; Display custom prompt "1=ADD 2=UP 3=DEL"
	K2.1..1	; Accept a 1-digit numeric type value
	I3.1.49	; Skip 3 commands if = 1 (add) (goto L682)
	I3.1.50	; Skip 3 commands if = 2 (update) (goto L683)
	I3.1.51	; Skip 3 commands if = 3 (delete) (goto L684)
	L681	; Link to routine to handle input error
	L682	; Link to routine to handle adding a password
	L683	; Link to routine to handle updating a password
	L684	; Link to routine to handle deleting a password

***L Call Subroutine**

Description: During the execution of a control string, the "*L" command causes the terminal to jump to another specified memory location and execute the control string or subroutine residing there. After executing that control string, the terminal returns to the command following the "*L" command in the original control string. These subroutines may be nested up to ten levels deep on PNC 330/340 and TRANZ 330/340 versions greater than 2.0, and ten levels deep on both the XL and TRANZ 380. The error message "MACRO OVERFLOW" appears if you program more than the maximum allowable nested subroutines.

*Note: If the second parameter of the *L command is anything other than "1", (for example, a request for multiple iterations of the subroutine), the control string called cannot link to another control string and continue to perform multiple iterations. In other words, a subroutine must be contained within a single memory location to perform multiple iterations.*

See Also:	Command	Description
	L *M	Link to Control String Explicit Return

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:

Terminal	Special Conditions
PNC 330/340	None
XL	None
TRANZ 330	None
TRANZ 340	None
TRANZ 380	None

Command Format:

***Lm.n**

***L - Call Subroutine**

Parameters:	Parameter	Default Value	Description
	m	000	Required; the memory location containing the subroutine control string; the default location 000 calls the download phone number
	n	1	Optional; the number of times to execute the subroutine
Example:	Command	Operation	
		; This routine is called to get all input for a refund transaction.	
	320\$		
	B.3	; Select source and destination buffer 3	
	G	; Clear destination buffer	
	U50	; Clear temporary storage for current card number	
	U51	; Clear temporary storage for current amount	
	U52	; Clear temporary storage for sequence number	
	U55	; Clear temporary storage for current approval number	
	*L330	; Call routine to get card numbers	
	*L331	; Call routine to get amount of refund	
	*L332	; Call routine to get original sequence number	
	*L333	; Call routine to get approval number of original transaction	

+L Lock and Unlock Keypad

Description: Locks or unlocks the keypad.

*Note: The keypad is automatically unlocked on ABORT ("*K") and before executing control string x07.*

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Available on versions 2.4 or greater
TRANZ 330	Available on versions 1.3 or greater
TRANZ 330 (202)	Available on versions 2.1 or greater
TRANZ 340	Available on versions 2.1 or greater
TRANZ 380	None

Command Format:

+La

Parameters:	Parameter	Default Value	Description
	a	0	Optional; options for this parameter are: 0 lock the keypad 1 unlock the keypad

Examples:	Command	Operation
	<pre>; This routine gets carrier and locks the keypad. 422\$ P72 ; Say, "WAITING FOR ANSR" G ; Clear buffer *V ; Get telephone status I10.2.56 ; If not waiting for answer - skip 10 commands G ; Else, clear buffer +K7.8 ; If carrier present, skip 8 commands B ; No-op to scan keyboard *W1 ; Delay 1 second I-3.7.#9 ; Keep checking for 25 seconds P73 ; When counter is zero - say, "NO ANSWER" *K3 ; Hangup *W1 ; Delay 1 second</pre>	

+L - Lock and Unlock Keypad

Examples (continued)	Command	Operation
	*L420	; Check for "WAITING FOR LINE"
	L423	; and try secondary phone number
	G	; Clear buffer
	P74	; Say, "CONNECTED"
	+K0	; Turn originate carrier on
	+L	; Lock the keyboard
	*W1	; Wait one second for possible ringback pulse
	L425	; Link to connection made

M Input from Cardreader Only

Description: Causes the terminal to accept input from the cardreader only, to place a field separator after the data entry and append the data to the destination buffer. When this command is used, there is no input type or data length restriction. If the user presses a key, the terminal beeps, displays CARD ENTRY ONLY for three seconds and returns to the idle prompt.

See Also:	Command	Description
	E	Input from Card Reader or Keypad
	+E	Input Variable Decimal Point
	K	Input from Keypad Only
	*U	Input from Bar Code Reader
	*Y	Check Input Devices

Category: Data Entry

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer updated
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Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	Parameters "s", "a", "c" not available
XL	Parameters "s", "a", "c" not available
TRANZ 330/340	Parameters "s", "a", "c" not available
TRANZ 380	None
ZON 5XX	(see Appendix J for unique bar code usage)

Command Format:

Ms.a.c

Parameters:	Parameter	Default Value	Description
	s	0	<p>Number of commands to skip if three bad card reads.</p> <p><i>Note: When reading two tracks, if one track contains an error or is not read properly, the terminal puts an error code in the destination buffer instead of the track information. The correctly read track will also be placed in the destination buffer, and the two tracks will be separated by the track separator. Errors are displayed as ^A - ^E on the terminal and as 0 - 5 in the destination buffer.</i></p>

M - Input from Cardreader Only

Parameters (continued)	Parameter	Default Value	Description
	a	0	Track Selection Options 0 = Track 2 1 = Track 1 2 = Tracks 1 and 2 3 = Track 3 4 = Tracks 2 and 3
	c	29	Track separator
Example:	Command		Operation
			; Get the account data from the cardreader only. Do Luhn check digit test.
	121\$		
	B3.3		; Select source and destination buffer as 3
	G		; Clear destination buffer
	F1		; Display fixed prompt "ENTER ACCOUNT #"
	M		; Accept entry from cardreader only
	C		; Do Luhn check digit
	U95		; Store account number and expiration date
	B.5		; Select destination buffer 5
	G		; Clear destination buffer
	H.61		; Search source buffer for an "=", which is ; start of expiration date
	O		; Move extraction pointer 1 pass "="
	X4		; Copy the expiration date from source buffer ; to the destination buffer
	U96		; Store expiration date separately

***M Exit Subroutine; Return to Control String**

Description: The "*M" command is an "explicit return;" it causes the terminal to immediately exit a subroutine and return to the original control string. Executing a "*M" command will reset the repeat counter, "n" in *Lm,n, to 1. To exit a subroutine without resetting the repeat counter, do not execute the "*M", but skip around it, allowing the control string to terminate.

*Note: You need not include the "*M" command at the end of a subroutine control string; the terminal will automatically return to the calling control string.*

See Also:	Command	Description
<i>Program Control Command:</i>		
	L	Link to Control String
	*L	Call Subroutine

End Control String Command:

*K Abort

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:



Parameters:	Parameter	Default Value	Description
(there are no parameters for the "*M" command)			

***M - Exit Subroutine; Return to Control String**

Example:	Command	Operation
	; This routine checks to see if anyone is logged on, a value other than "00"	
	; in memory location 80 would indicate someone is logged on.	
	170=MUST LOGON FIRST	
	145\$	
	B5.5	; Select source and destination buffer 5
	G	; Clear destination buffer
	A80	; Append logon ID
	I1.1.'00'	; If zero skip 1, because we aren't logged on, ; else return
	*M	; Return we have someone logged on
	P170	; Display "MUST LOGON FIRST"
	*K1	; Abort and leave error display at idle state

+M Set Modem Parameters

Description: Sets the answer/originate mode and data format parameters for the modem. On PNC 330, TRANZ 330 versions 2.1 or greater and TRANZ 380 the command enables/disables re-transmission on ENQ/NAK.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Communications Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported: **Terminal** **Special Conditions**

PNC 330	None
PNC 340	Not available
XL	Not available (7EI only)
TRANZ 330	"a3" and "a4" parameters available on Versions 2.1 or greater
TRANZ 330 (202)	Not available
TRANZ 340	Not available
TRANZ 380	None

Command Format:

+Ma1.a2.a3.a4

+M - Set Modem Parameters

Parameters:	Parameter	Default Value	Description
	a1	0	Optional; options for this parameter are: 0 no change (set to originate on abort) 1 set originate 2 set answer
	a2	0	Optional; options for this parameter are: 0 no change (set to 7E1, pass 7 on abort) 1 set 7E1, pass 7 bits 2 set 8N1, pass 7 bits 3 set 8N1, pass 8 bits
	a3	0	Optional; options for this parameter are: 0 no change (enabled on abort) 1 enable re-transmission on NAK 2 disable re-transmission on NAK
	a4	1	Optional; options for this parameter are: 0 no change (disabled on abort) 1 enable re-transmission on ENQ 2 disable re-transmission on ENQ

Examples:	Command	Operation
	; Auto-answer control string to set up modem defaults and call ; routine to handle processing. 038\$ +M.3 ; Answer mode 8,N,1 +K ; Raise carrier *W2 ; Pause *P....2 ; Set 1200 baud +K5 ; Wait for 1200 bps carrier +K ; Change to PSK *R2.2.2 ; Serial port 1200 8,N,1 *N#1.2 *L913 ; Call routine to handle processing *K ; Abort and return to idle prompt	

N Send Destination Buffer to Printer

Description: Causes the terminal to send data in the destination buffer to the printer. Appends <CR><LF> to destination buffer.

Note: The terminal returns to the control string if the print buffer is full. Use with the "W" command (wait until the print buffer is empty to execute).

See Also:	Command	Description
<i>RS-232 Communications Command:</i>		
	*I	Send over RS-232
	*R	Specify Device, Speed and Format
	+R	Set RS-232
<i>Printing Commands:</i>		
	W	Wait for Print Buffer
Category:	Outputs and Data Display	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	"a" and "t" parameters not available in versions prior to 2.11
	TRANZ 330/340/380	None

Command Format:

Nn.a.t

Parameters:	Parameter	Default Value	Description
	n	0	Optional; the number of carriage returns and line feed combinations to append to the destination buffer; the default is 0 For example, if the "n" parameter is 4, the printer will print the contents of the buffer, add one carriage return, and advance the paper three lines.

N - Send Destination Buffer to Printer

Parameters:
(continued)

Parameter	Default Value	Description
<p><i>Note: Remember, each buffer can hold up to 250 characters; if you specify too large a number for the "n" parameter and the buffer can not accommodate your request, the buffer will overflow, corrupting itself and the following buffer. Also remember that the terminal appends the specified number of carriage returns and line feed combinations to the destination buffer before sending the contents of the buffer to the printer. To use data after it has been printed, you may want to strip the carriage return and line feed characters off the end of the buffer.</i></p>		
a	0	Optional; slip printer driver specifier 0 print data now; if out of paper, print as soon as paper is inserted 1 print data now; if out of paper, display 'INSERT FORM...'; wait "t" half seconds, display "PRINTING", then print. 2 print data now; if out of paper, display 'INSERT FORM ...'; when paper is inserted, display 'PRESS ENTER'; when [FUNC/ENTER] key is pressed display 'PRINTING' and then start printing. <i>Note: This only works for P100 emulation.</i>
t	0	Number of half seconds to wait after detecting paper if "a" parameter = 1.

Example:

Command	Operation
550\$	
B.5	; Select buffer 5 to work in
G	; Clear destination buffer
A70	; Append merchant name
Z40.2	; Center it
N1	; Print
G	; Clear destination buffer
A71	; Append merchant address
Z40.2	; Center it
W	; Make sure printer buffer doesn't overflow
N1	; Print
G	; Clear destination buffer
A72	; Append merchant city, state, zip code
Z40.2	; Center it
W	; Make sure printer buffer doesn't overflow
N2	; Print and skip one line

***N Set Variable**

Description: Use the "*N" command to set any variable. On the PNC 330/340, TRANZ 330/340 versions 1.3 or greater, and TRANZ 380, a variable can be any value ranging from 0-65535. On TRANZ versions 1.2 and below and all XL versions the variable value range is 0-255. The terminal will truncate any set variable that is greater than its range. You must use a "#" (pound sign) to indicate a variable, even when using the default variable 0.

WARNING: Setting a variable to an alphanumeric string will have unpredictable results.

See Also:	Command	Description
	+A *O +Q *Q	Compare Variable Arithmetic on Variables Append Variable to Buffer Set Variable from Buffer

Category: Variable Operations

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:

Terminal	Special Conditions
PNC 330/340 XL TRANZ 330/340/380	None None None

Command Format:

***N#v.C**

Parameters:

Parameter	Default Value	Description
#v	0	Optional; variable you want to set; when specifying a number as a variable, remember to precede the number with the pound (#) sign; for example, to set the variable 3 to the value of 100, write *N#3,100
c	0	Optional; value associated with variable; this parameter may be a decimal constant or another variable

***N - Set Variable**

Examples:	Command	Operation
	<pre>; This routine gets the receipt header MEMORY MAP ; 133 = Print data : Header Line 1 ; 134 = Print data : Header Line 2 ; 135 = Print data : Header Line 3 ; 136 = Print data : Header Line 4 ; 719 = Subroutine : Initialize variables ; 720 = Prompt : RECEIPT HEADER # ; 721 = Temporary storage 720=RECEIPT HEADER 719\$ *N#1 *N#2.4 *N#3.132 B4.4 A950 I2.1.51 *N#4.40 I1 *N#4.26 *M</pre>	<pre>; This routine initializes variables ; Initialize receipt header number to 0 ; Initialize loop counter to 4 ; Initialize header storage memory location ; Select buffer 4 ; Append type of printer ; If the printer type is 100 (a '3') then skip ; Else printer type is 200 (a '2') so set ; #4 to 40 - maximum number of printable ; columns ; Printer type 100: 26 is the maximum number ; of printable columns ; Return</pre>

O

Move Extraction Pointer Within Source Buffer

Description: Moves the extraction pointer either forward or backward within the source buffer by the number of characters you specify.

See Also:	Command	Description
	B	Select Buffers
	D	Delete Characters from Buffer
	G	Clear Destination
	H	Search for String
	+J	Buffer Modification
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer

Moves extraction pointer n positions

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

On

Parameters:	Parameter	Default Value	Description
	n	1	Optional; the number of characters to move the extraction pointer; use a positive number to increment, or a negative number to decrement the extraction pointer (insert a "-" to indicate a negative number)

O - Move Extraction Pointer Within Source Buffer

Example:	Command	Operation
		; Get the account data either manually or from the cardreader. Extract the ; expiration date from the Track 2 data and store separately.
	131\$	
	B3.3	; Select source and destination buffer as 3
	G	; Clear destination buffer
	F1	; Display fixed prompt "ENTER ACCOUNT #"
	E5.3	; Accept entry from cardreader or keypad, skip 5 ; commands if the input is from the cardreader, ; accept alphanumeric characters
	I-3.1	; If nothing is entered, start over getting input
	D	; Delete field separator at end
	*L122	; Get expiration date manually,
	U95	; store account number and expiration date
	I7	; Skip over magnetic stripe handling code
	U95	; Store magnetic stripe data
	B.5	; Select destination buffer 5
	G	; Clear destination buffer
	H.61	; Search source buffer for an "=", ; which is start of expiration date
	O	; Move extraction pointer 1 past "="
	X4	; Copy the expiration date from source buffer to ; the destination buffer
	U96	; Store the expiration date separately

***O Perform Arithmetic on Variables**

Description: Performs arithmetic operations on a variable. The result of the operation is stored in the first variable, the "v" parameter. On PNC 330/340, TRANZ 330/340 versions 1.3 or greater and TRANZ 380, a variable can be any value ranging from 0-65535. On TRANZ versions 1.2 and below and all XL versions the variable range is 0-255. The terminal will truncate any set variable that is greater than its range. You must use a "#" (pound sign) to indicate a variable, even when using the default variable 0.

Note: Specifying a command parameter as 0 is the same as not specifying the parameter at all and will result in the default value for the parameter being used.

WARNING: Setting a variable to an alphanumeric string will have unpredictable results; it will not execute the command if the divisor is zero.

See Also:	Command	Description
<i>Arithmetic Commands:</i>		
	T	Arithmetic on Memory Location
<i>Variable Commands:</i>		
	+A	Compare Variable
	*N	Set Variable
	+Q	Append Variable to Buffer
	*Q	Set Variable from Buffer
Category:	Variable Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340 XL TRANZ 330/340/380	None Logical operations not supported None

Command Format:

***O#V.O.C.S**

*O - Perform Arithmetic on Variables

Parameters:

Parameter	Default Value	Description
#v	0	Optional; the variable or first operand
o	0	Optional; the operation code; the default code 0 is addition; operation code options include: 0 addition 1 subtraction 2 multiplication 3 division to produce a quotient 4 division to produce remainder 5 logical AND 6 logical OR 7 logical XOR
c	0 or 1	Optional; the second operand; operand can be either a decimal constant or another variable; if it is not specified and "o" parameter = 0-4, the value is set to 1; if "o" parameter is 5, 6 or 7, the value is set to 0
s	0	Optional; number of commands to skip if result of operation is 0.

Examples:

Command	Operation
*O#6.0.25	; Add 25 to the variable 6
*O#7.2.3	; Multiply the variable 7 by 3
*O#9	; Increment the variable 9 by 1

P Display Custom Prompts

Description: Causes the terminal to display the contents of a specified memory location. This command is often used to display custom prompts or other messages stored in general record memory locations.

Note: On the PNC 330 and TRANZ 330/380, the "P" command will not affect the display until keyboard entry has occurred. For example, if the card is swiped from the idle prompt and a "P" command appears in the code before the "E" or "K" command, the display will not be updated. Use the "V" command if the prompt is to be displayed regardless of data availability.

See Also:

Command	Description
F	Display Fixed Prompt
*J	Justify Display
V	Display Buffer

Category: Outputs and Data Display

Buffer Status:

Source Buffer	Destination Buffer
No change	No change

Terminals Supported:

Terminal	Special Conditions
PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

Pm

Parameters:

Parameter	Default Value	Description
m	000	Optional; memory location where the prompt is stored; default value, 000, displays download phone no.

Examples:

Command	Operation
; This routine prompts for the tip amount. 60=ENTER TIP AMOUNT 720\$ B.4 G P60 K4 U90	; Select destination buffer 4 ; Clear destination buffer ; Display custom prompt "ENTER TIP AMOUNT" ; Accept dollar amount ; Store the tip amount

; This routine prompts for the tip amount.

60=ENTER TIP AMOUNT

720\$

B.4

G

P60

K4

U90

; Select destination buffer 4

; Clear destination buffer

; Display custom prompt "ENTER TIP AMOUNT"

; Accept dollar amount

; Store the tip amount

***P - Specify Communication Characters**

***P Specify Communication Characters**

Description: Allows you to specify or change the communication characters to be used in the transmit packet. Using this command, you can set the termination character and a special receive character. You can also specify the number of NAKs the terminal will allow before hanging up the telephone connection. This command also allows you to set the modem speed for TRANZ 330 212A terminals.

Note: If using direct custom communications on TRANZ 330 212A, you must use the "P" command to set the modem baud rate.

See Also:	Command	Description
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+D	Tone Dial
+F	Response ACK
+I	Send Over Modem
+K	Carrier Control
+M	Set Modem Parameters
*R	Specify Device, Speed and Format
S	Dial Phone Number
*T	Specify Timeouts
*V	Append Phone Status
+X	Transmit Data to Network
+Y	Receive Data from Network

Category: Communications Control

Buffer Status:	Source Buffer	Destination Buffer
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No change	No change
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Terminals Supported:	Terminal	Special Conditions
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PNC 330	None
PNC 340	Not available
XL	Parameter a2 not available
TRANZ 330	Parameter a2 available on (212) model and TRANZ 330 M/TELCO
TRANZ 330 (202)	Not available
TRANZ 340	Not available
TRANZ 380	None

Command Format:

***Pc1.c2.n.a1.a2**

*P - Specify Communication Characters

Parameters:	Parameter	Default Value	Description
	c1	ETX	Optional; the decimal equivalent of the character desired for the termination character of the request packet (character signaling the end of the request packet), such as the ETX; the default value is no change.
	c2	STX	Optional; the decimal equivalent of a special receive exit character; after sending the transmit packet, the terminal waits for a response packet and watches for this special character; upon receiving the special receive character, the terminal exits the communication subroutine and sends only this character to the response analysis buffer. It will only receive an entire packet if this character is <STX>. <i>Note: The character must be from decimal 1 to 127.</i>
	n	3	Optional; number of NAKs that can be sent or received before the terminal hangs up; for example, if the "n" parameter equals 3, terminal can send and receive three NAKs without hanging up; once it sends or receives a fourth NAK, it will hang up; when the "n" equals 0 or blank, the number of NAKS remains at the current value
	a1	0	Optional; multiple ACK protocol specifier; if EOT not received, resend ACK up to 4 times 0 no change (disabled upon abort) 1 multi-ACK disabled 2 multi-ACK enabled
	a2	0	Optional; modem speed 0 no change (300 baud upon abort) 1 300 baud 2 1200 baud

Examples:	Command	Operation
	*P23.64..2	; Set the termination character to ETB, ; and wait for the host response package ; or an "@" sign, enable multi-ACK

Refer to Appendix D for communication examples using this command.

+P - Timeout in Milliseconds

+P Timeout in Milliseconds

Description: Allows you to wait for a selected period of time in milliseconds. The default is 1 second, or 1000 milliseconds.

See Also:	Command	Description
	W	Wait for Print Buffer
	*W	General Wait
Category:	Process and Flow Control	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	Available on 2.70 and greater
	TRANZ 330	Available on 3.40 and greater
	TRAZZ 380	None

Command Format:

+Pt

Parameters:	Parameter	Default Value	Description
	t	1000	Allows you to wait for a selected period of time in milliseconds. The default is 1 second, or 1000 milliseconds. Valid values can range from 1 to 30000, and if any other value is entered, the default will be used. If you need more than 30 seconds, use the command again to get the required value.

Examples:	Command	Operation
	+P	; Wait for 1 second (1000 milliseconds).
	+P5000	; Wait for 5000 milliseconds (5 seconds).
	+P800	; Wait for 800 milliseconds.

Q**Append Write Control Character**

Description: Appends the write control character (WCC) to the destination buffer and the pointer to the WCC in to WCCPTR. The WCC is a special bit-mapped code that tells the host:

- whether to use a single or multi-transaction protocol,
- whether the account number was read from a magnetic stripe or manually entered via the keypad.

See Also:	Command	Description
	A	Append from Memory Location
	J	Append Clock Data
	+Q	Append Variable to Buffer
	R	Append Constant
	+V	Append Sign On Message
	X	Append from Source
	Y	Append Non-Blank Memory Location
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

QC

Q - Append Write Control Character

Parameters:

Parameter	Default Value	Description
c	0	Optional; the WCC base to be converted from decimal into binary; the binary equivalent is then stored into the WCC as "ttt". The Write Control Character format is: 01tttmc 01 is a constant literal; the terminal automatically sets this value ttt format bits which are application specific; these bits are set according to parameter
m	0	(single transaction), or 1 (multi-transaction session); terminal automatically sets this value
c	0	(account data came from keypad), or 1 (account data came from cardreader); the terminal automatically sets this value

Example:

Command	Operation
Q8	<pre> ; Send a WCC of "H" for single transaction ; with account data entered via keypad, ; or "I" for a single transaction with account ; data entered via cardreader. ; Format = 01 ttt m c ; 8 = 00 0010 0 0 ; 01 0010 M C ; 01 0010 0 0 = H acct from keyboard ; 01 0010 0 1 = I acct from cardreader </pre>
Q16	<pre> ; Send a WCC of "P" for a single transaction ; from the keypad, or "Q" for a single transaction ; from the cardreader ; 16 = 00 01 00 00 ; 01 01 00 M C ; 01 01 00 00 = P acct from keyboard ; 01 01 00 01 = Q acct from cardreader </pre>

***Q Set a Variable from the Contents of a Buffer**

Description: Sets a variable from the contents of the destination buffer. On the PNC 330/340 and TRANZ 330/340 versions 1.3 or greater, a variable can be any value ranging from 0-65535. On TRANZ versions 1.2 and below and all XL versions the variable range is 0-255. The terminal will truncate any set variable that is greater than its range. You must use a "#" (pound sign) to indicate a variable, even when using the default variable 0.

WARNING: Setting a variable to an alphanumeric string will have unpredictable results.

See Also:	Command	Description
	+A	Compare Variable
	*N	Set Variable
	*O	Arithmetic on Variables
	+Q	Append Variable to Buffer
Category:	Variable Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	Does not support ASCII conversion of variables ("a" parameter) in versions less than 2.80
	TRANZ 330/340/380	None

Command Format:

***Q#v.b.a**

*Q - Set a Variable from the Contents of a Buffer

Parameters:	Parameter	Default Value	Description
	#v	0	Optional; the variable to set; when specifying a number as a variable, remember to precede the number with a pound (#) sign; for example, to specify variable 3, write *Q#3
	b	destination buffer	Required; identifies buffer to be used to set variable Buffer options include: 0 no change from current buffer 1 Buffer 1—Transmit Buffer 2 Buffer 2—Receive Buffer 3 Buffer 3 4 Buffer 4 5 Buffer 5
	a	0	Optional; type or conversion 0 = string Ex: If buffer = "2748", then variable = 2748 1 = ASCII Ex: If buffer = "V" then variable = 86 which is decimal for 56h. Ex: If buffer = "XY" then variable = 22617, which is decimal for 5859h.

Note: The first two characters are converted to the hexadecimal representation of the character. The variable will contain decimal values supporting the terminal's display capability.

*Q - Set a Variable from the Contents of a Buffer

Example:	Command	Operation
	; This routine prompts for report type of BATCH, SHIFT, or DAY report and ; based upon selection calls correct routine to print.	
	71=1=BTH 2=SHT 3=DY	
	280\$	
	B.3	; Select work buffer 3
	G	; Clear buffer
	P71	; Prompt with "1=BTH 2=SHT 3=DY"
	K2.1..1	; Get from the keyboard a 1-digit number
	D	; Get rid of field separator at end
	*Q#7	; Set variable #7 to hold report type
	+A#7..1.5	; If "1", print batch report
	+A#7..2.5	; If "2", print shift report
	+A#7..3.5	; If "3", print day report
	P72	; Display "INVALID TYPE"
	*W2	; Wait for 2 seconds
	I-10	; If not a 1, 2, or 3 skip back and prompt again
	L560	; Link to print batch report
	L561	; Link to print shift report
	L562	; Link to print day report

+Q - Appends Variable to Destination Buffer

+Q Appends Variable to Destination Buffer

Description: Appends a variable to the contents of a buffer. On the PNC 330/340, TRANZ 330/340 versions 1.3 or greater and the TRANZ 380, a variable can be any value ranging from 0-65535. On TRANZ versions 1.2 and below and all XL versions the variable range is 0-255. The terminal will truncate any set variable that is greater than its range. You must use a "#" (pound sign) to indicate a variable, even when using the default variable 0.

See Also: **Command** **Description**

A	Append from Memory Location
J	Append Clock Data
Q	Append Write Control Character
R	Append Constant
+V	Append Sign On Message
X	Append from Source
Y	Append Non-Blank Memory Location

Category: Variable Operations

Buffer Status: **Source Buffer** **Destination Buffer**

No change Buffer updated

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Available on versions 2.4 or greater
TRANZ 330	Available on versions 1.3 or greater
TRANZ 330 (202)	Available on versions 2.1 or greater
TRANZ 340	Available on versions 2.1 or greater
TRANZ 380	None

Command Format:

+Q#v.a

Parameters: **Parameter** **Default Value** **Description**

#v	0	Optional; the variable to convert; when specifying a variable, remember to precede the number with a pound (#) sign
a	0	Optional; type of conversion; options include: 0 string V=2748 (0ABC) buffer = "2748" 1 ASCII V=86 (0056h) buffer ="V" V=2261 (5859h) buffer ="XY"

Examples:	Command	Operation
	*N#2.0 *N#0.149 B.4 G U42 B4.4 G +Q#2 I1.1.'28' I2 *L115 *M B.5 G U#0 *O#2 *O#0 I-12	; This routine will clear a set of memory locations starting with memory ; location stored in variable # 0 and incrementing 28 times using #2 as ; the counter. 114\$; Set counter to 0 ; Set starting memory location to begin clearing ; Select destination buffer ; Clear destination buffer ; Clear counter ; Select source and destination buffer ; Clear destination buffer ; Append counter to destination buffer ; If equal 28 skip 1 and finish ; Otherwise skip and continue ; Open the batch ; Otherwise finish ; Select destination buffer ; Clear destination buffer ; Clear memory locations ; Increment the counter ; Increment the memory location ; Loop back and do again.

R - Append Constant Value to Destination Buffer

R Append Constant Value to Destination Buffer

Description: Appends a constant string of one or more characters to the data in the destination buffer.

See Also:	Command	Description
	A	Append from Memory Location
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	+V	Append Sign On Message
	X	Append from Source
	Y	Append Non-Blank Memory Location
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330	None
	PNC 340	None
	XL	None
	TRANZ 330	Using "R256" to append a null character (00h) to the buffer results in an SOH character (01h) being appended in 3.0/2.3 firmware
	TRANZ 340	Using "R256" to append a null character (00h) to the buffer results in an SOH character (01h) being appended in 3.0/2.3 firmware
	TRANZ 380	None

Command Format:

Rc

R - Append Constant Value to Destination Buffer

Parameters:	Parameter	Default Value	Description		
	c	28/FS	Optional; a literal string enclosed in single quotes or the decimal value of the character you want to append to the destination buffer; the default is 28, the decimal value for an ASCII field separator		
Examples:	Command	Operation			
	;	This routine prints the date and time, then aborts.			
	180\$				
	B.5	; Select destination buffer 5			
	G	; Clear destination buffer			
	R'DATE: '	; Append "DATE: "			
	J'B/C/A'	; Append "MM/DD/YY"			
	Z22	; Pad up to 22 spaces, left justified			
	R'TIME: '	; Append "TIME: "			
	J'K:E:F'	; Append "HH:MM:SS"			
	N1	; Print line			
	W	; Wait for opsys printer buffer to empty			
	*K	; Abort, return to idle prompt			
Notes:	<i>Command "R" will only append one decimal value at a time. If you want to append more than one character, you need to use single quotes.</i>				
	<i>When you need to append a <NULL> (dec. 0) to a buffer, use R128, R256, or depending on the EPROM, append a <NULL> to a memory location. (Set a variable to zero, then append it to the destination buffer converted to ASCII, then store.)</i>				

*R - Select Communication Device, Speed

*R Select Communication Device, Speed

Description: Selects the communications device, speed and data format parameters for the RS-232 port.

See Also:	Command	Description
<i>RS-232 Communications:</i>		
	*I	Send over RS-232
	N	Send Buffer to Printer
	+R	Set RS-232
<i>Modem Communications:</i>		
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Communications Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
<i>Terminals Supported:</i>		
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"a ₁ " not available; command operates on RS-232 port only (<i>not supported in PNC mode</i>)
	XL	Parameters "a ₂ " "a ₃ " "a ₄ " apply only when RS-232 port selected *R.4, *R.5, *R.6 transmit only
	TRANZ 330/340	"a ₁ " not available; command operates on RS-232 port only. Option 3 of "a ₄ " added in 2.1, option 2 of "a ₄ " broken in 2.1 and fixed in 2.3
	TRANZ 380	None

Command
Format (XL):

***Ra1.a2.a3.a4**

Parameters:	Parameter	Default Value	Description
	a1	0 (modem)	Optional; select port. Options are: 0 select internal modem; 300 baud 1 select RS-232 port
	a2	0 (300 baud)	Optional; the baud rate at which data is transferred via the RS-232 port; baud rate options include: 0 300 baud 1 600 baud 2 1200 baud 3 2400 baud 4 4800 baud* 5 9600 baud* 6 19200 baud*
			*While the XL can transmit and receive at baud rates of 2400 or lower, it can only transmit at 4800 and higher.
	a3	see desc. 0	Optional; handshake sense to be used when (current value) the RS-232 port is selected; handshake options include: no change from current value 1 no handshake (default on ABORT) 2 transmit when line is MARK (voltage high) 3 transmit when line is SPACE (voltage low)
	a4	see desc. 0	Optional; data format to be used when RS-232 port is selected; format options include: 0 no change 1 7 data bits, even parity (default on ABORT) 2 8 data bits, no parity

*R - Select Communication Device, Speed

Example: This is an XL example selecting the RS-232 port and must be done using (XL) standard communications and standard VISA 1 protocol.

Command	Operation
052=*R RS232 PORT TEST	; Data to send
100=1;	; Dummy phone number
104=1;	; Merchant ID
108=300 7E1;	; Transaction type prompt
107\$	
B1.1	; Select transmit buffer
G	; Clear it
R2	; Append
A52	; Append data to buffer
A108	; Append data to buffer
*R1.0	; Select RS-232 port
	; Set at 300 baud, 7E1
	; and drop into standard
	; communications
110\$; Response analysis control string
	; view data received
B2.2	; Select receive buffer
V	; View it
*K1	; Abort, leaving display

Command Format:
(TRANZ)

*Ra2.a3.a4

Parameters:

Parameter	Default Value	Description
a1	0 (300 baud)	Optional; the baud rate at which data is transferred via the RS-232 port; baud rate options include: 0 300 baud 1 600 baud 2 1200 baud 3 2400 baud 4 4800 baud 5 9600 baud 6 19200 baud
a2	see desc.	Optional; handshake sense to be used when (current value) the RS-232 port is selected; handshake options include: 0 no change 1 transmit when line is MARK (voltage high) (default on ABORT) 2 no handshake

Parameters: (continued)	Parameter	Default Value	Description
	a3	see desc.	Optional; data format to be used when RS-232 port is selected; format options include: 0 no change 1 7 data bits, even parity, 1 stop bit (default on ABORT) 2 8 data bits, no parity, 1 stop bit 3 8 data bits, no parity, strip parity on receive
Example: (TRANZ)	Command		Operation
			<pre>; This routine is called to check to see if a roll printer is attached on a ; TRANZ. 80=NO COMM W/PRINTER 450\$</pre>
	B1.1		; Select source and destination buffer
	G		; Clear destination buffer
	R17		; Append decimal 17 to destination buffer
	*R5.2.1		; Set RS-232 port parameter to baud rate of 9600, ; handshake 3 wire system, 7E1
	*I		; Send transmit buffer over RS-232 port
	*W1		; Pause for 1 second
	+R6.2		; If we are handshaking skip 2
	P80		; Display "NO COMM W/PRINTER"
	*K1		; Abort and leave up current display

+R - Get/Set RS-232 Handshake Lines

+R Get/Set RS-232 Handshake Lines

Description: Gets/sets the RS-232 signal lines and allows you to skip a designated number of commands if signal one, two or one and two are high.

The PNC 330 and TRANZ 330/380 can be configured as a DTE (Data Terminal Equipment) interface or a DCE (Data Communications Equipment) interface, using the RS-232 port, however, the PNC 330 and TRANZ 330/380 has only 3 control signal pins. Required control signals differ according to the device being interfaced.

Pin/Function	PNC/TRANZ (DTE)	PNC/TRANZ (DCE)
Pin 3 (toggle)	Request to Send ¹ (DTR) Data Terminal Ready ¹	Data Set Ready ¹ (DSR) Clear to Send ¹ (CTS)
Pin 2 (test)	(DSR) Data Set Ready ² (DCD) Carrier Detect ²	Carrier Detect ¹ (DCD) Data Terminal Ready ² (DTR)
Pin 4 (test)	(CTS) Clear to Send ²	Request to Send ² (RTS)

¹ controlled by PNC/TRANZ

² controlled by ECR/PC

See Also:	Command	Description
	*I	Send over RS-232
	N	Send Buffer to Printer
	+R	Specify Device, Speed and Format

Category: Communication Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340 XL	None (<i>not supported when in PNC mode</i>) Available on 2.8 or greater supporting the parameter option to skip if the handshake is not active. "a" parameter not available.
	XL 300	Available on 1.25 or greater supporting the parameter option to skip if the handshake is active. "a" parameter not available.
	TRANZ 330 TRANZ 330 (202) TRANZ 340 TRANZ 380	Available on versions 1.3 or greater Available on versions 2.1 or greater Available on versions 2.1 or greater None

Command Format:
(PNC/TRANZ)

(XL/XL300)

+Ra.S
+Rs

Parameters:

Parameter	Default Value	Description
a	0	Optional; the options are: 0 drop the voltage on the output handshake line (DIN 8, pin 3) 1 raise the voltage on the output handshake line 5 skip "s" parameter if signal one (DSR) is high. (DIN 8, pin 2) 6 skip "s" parameter if signal two (CTS) is high (DIN 8, pin 4) 7 skip "s" parameter if signal one and two are high (DIN 8, pin 2 & 4)
s	0	Optional; number of commands to skip

+R - Get/Set RS-232 Handshake Lines

Example: (PNC 330 or TRANZ 330)	Command	Operation
	338\$; This routine checks the printer handshake
	B4.4	; Select buffer
	G	; Clear destination
	R32	; Append a space to the buffer
	N	; Send it to the printer
	*W1	; Delay 1 second
	+R6.3	; Skip three if handshake is active
	P94	; Say, "PRINTR NOT READY"
	*G1	; Beep
	*K1	; and abort leaving display
Example: (XL)	B5.5	
	G	
	R13	; <CR>
	N	; Send it to the printer
	*W1	; Wait for P200
	+R6	; Skip if no handshake
	G	; Else P200 is ON and ready
	R'THIS IS A TEST'	
	N1	; Print the line
	W	; Wait for print buffer
	*K	
	F61	; No handshake detected, display any message
	*G1	; so that we know it didn't respond
	*K1	

Note: The XL 300 is the same except for command +R6, where it will skip if there is handshake.

S Dial or Set Multiple Transaction Function

Description: Causes the terminal to either dial a telephone number in any memory location, or set the multiple-transaction function.

Dialing options "M" and "N" select 300 and 1200 baud, respectively, on a PNC 330 or TRANZ 330/380 and are placed at the end of a telephone number. "W" and "-" are pause characters you can insert where needed to control dialing. "D" inserted after the "9" (or other outside line) digit indicates the terminal should wait until dial tone is detected before sending a transaction to the host. An example of a telephone number with a pause and 300 baud would look like: **9-8445555M**.

Other dialing options you can add at the end of a phone number are "Xn" and "Ln" for selecting a login string. See Appendix I for login information.

If the "N" dialing option which selects 1200 baud is used, the "S" command can only work in memory location x07/0x07.

See the "*K" command to hang-up when using the "S" command in any routine other than the default communication.

***WARNING:** If you issue an "S" command to start dialing and a phone line is not attached (for example for a demo or offline transaction), printer operations will be inhibited.*

Note: The execution of S₁ or S₂ commands will set the terminal in multi-transaction mode. Multi trans timeout will be set by the contents of memory location 007/0007. If 007/0007 is <empty>, the terminal will default to 3 20-second intervals, or 60 seconds. The contents of 007/0007 represents 20-second intervals but will not apply if in the idle loop or auto answer control strings.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Process and Flow Control

S - Dial or Set Multiple Transaction Function

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions

PNC 330 None
 PNC 340 S0, S3 and "m" parameter not available
 XL S3 not available
 TRANZ 330 None
 TRANZ 330 (202) S0, S3 and "m" parameter not available
 TRANZ 340 S0, S3 and "m" parameter not available
 TRANZ 380 None

Command Format:

Sa.m

Parameters:	Parameter	Default Value	Description
	a	0	Optional; this parameter functions when the following values are used: 0 start dialing primary phone number or "m" (On TRANZ 340 0=do nothing) 1 enable multi-transaction mode, but do not allow viewing of host response 2 enable multi-transaction mode and allow viewing of host response 3 go off hook immediately (does not check for parallel phone in use).
	m	primary phone number	Optional; memory location to dial if "a" = 0 or is blank; if "m" parameter = 0 or does not exist, and this command is part of the control string initiated from memory location x07/0x07, terminal automatically dials host's primary telephone number stored in memory location x00 (x = transaction keys 1 through 9).

Examples:

Command	Operation
S2	; Enable multi-trans mode and display host responses
S	; Start dialing the host's primary telephone number now
S.350	; Dial the phone number in memory location 350.

Note: On TRANZ 330 EPROM versions less than 3.60, and PNC 330 versions less than 3.5, multi-trans does not time out when using S₁ or S₂ if an <ENQ> is received before the timeout value set in memory location 007 is reached.

***S - Verify Memory Available**

***S Verify Memory Available**

Description: Ensures there is enough memory available for a specific memory requirement. If the number of available bytes is greater than the "n" parameter, the terminal will skip "s" number of commands.

See Also:	Command	Description
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+S	Get Buffer Size
*Z	Calculate Free Bytes

Category: Data Capture and Batch Functions

Buffer Status:	Source Buffer	Destination Buffer
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No change	No change
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Terminals Supported:	Terminal	Special Conditions
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PNC 330/340	Parameter "a" not available
XL	Parameter "a" not available
TRANZ 330/340	Parameter "a" not available
TRANZ 380	Parameter "a" available on version 1.10 or greater

Command Format:

***Ss.n.a**

Parameters:	Parameter	Default Value	Description
s	0	Optional; the number of commands to skip when more than number of bytes specified in "n" parameter are available	
n	0	Required; the number of free bytes required; the terminal will check to see if the number of required bytes is available	
a	0	Optional; select type of memory to verify space availability: 0 = Program memory 1 = Batch memory	

Example:	Command	Operation
		; Check if 40 bytes of memory are available. If ; not, display "NOT ENOUGH MEMORY" and ; abort. If memory is available, add contents of ; destination buffer to the open batch.
	*S2.40	; If more than 40 bytes of memory are available, ; skip 2 commands.
	P123	; Display "NOT ENOUGH MEMORY" prompt ; (stored at memory location 123)
	*K1	; Abort control string
	*C	; Add destination buffer to the open batch

+S - Get Buffer Size

+S Get Buffer Size

Description: Gets the size of the destination buffer, places it into the specified variable. The resulting length may be either the actual length or the compressed length.

See Also:	Command	Description	
	<i>Size:</i>		
	*S	Get Memory Size	
	*Z	Calculate Free Bytes	
	<i>Buffer Commands:</i>		
	B	Select Buffers	
	D	Delete Characters from Buffer	
	G	Clear Destination	
	H	Search for String	
	+J	Buffer Modification	
	O	Move Extraction Pointer	
	U	Copy Buffer to Memory Location	
	V	Display Buffer	
	Z	Pad Destination Buffer	
Category:	Buffer Operations		
Buffer Status:	Source Buffer	Destination Buffer	
	No change	No change; buffer read for size	
Terminals Supported:	Terminal	Special Conditions	
	PNC 330/340 XL TRANZ 330 TRANZ 330 (202) TRANZ 340 TRANZ 380	None Available on versions 2.4 or greater Available on versions 1.4 or greater Available on versions 2.1 or greater Available on versions 2.1 or greater None	
Command Format:	+Sb.a.#v		
Parameters:	Parameter	Default Value	Description
	b	destination	Buffer
	a	0	0 = uncompressed 1 = compressed
	#v	0	variable

Examples:	Command	Operation
	+S4.1.#3 *S2.#3 P88 *K1 +G	; This routine will get the size of the data capture record that we are about to write to memory and verify that there is enough memory available to add the record 88=NOT ENOUGH MEMORY 670\$; Get the compressed size of the record ; and store variable #3 ; If more bytes are available than the size we have in variable #3, then skip 2 ; Display "NOT ENOUGH MEMORY" ; Abort and leave current display ; Add destination buffer to the selected batch

T Perform Arithmetic Operations

Description: Performs integer arithmetic operations on the contents of a specified memory location and the destination buffer. The terminal will write the result of the operation back into the specified memory location. When you perform arithmetic on two strings, the arithmetic is only applied to the numbers contained in the string; the terminal ignores alphabet and decimal points, and uses any dash within the string as a negative sign. For example, if you added the strings QF1E2.3I-2 and QA5B1C1, the terminal would add the numbers -1232 and 511; the decimal points are not included in the result.

Note: The answer can consist of as many as 15 digits.

See Also:	Command	Description
	*O	Arithmetic on Variables
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

Tm.o

Parameters:	Parameter	Default Value	Description
	m	000	Optional; the memory location to be used
	o	0	Optional; operation code identifying operation to be performed; default operation code is 0, for addition; other operation code options include:
		0	0 ml = ml + db (addition) 1 ml = ml - db (subtraction) 2 ml = ml * db (multiplication) 3 ml = ml / db (division) 4 ml = the remainder of ml/db (modulo) legend: ml = memory location; db = destination buffer

Note: When performing division, operation 3 produces a quotient, and operation 4 produces the remainder. Operations have a 15-digit maximum (e.g., 999,999,999,999,999).

If adding a value to a value with a decimal point, the decimal point is ignored.

Examples:	Command	Operation								
	126\$									
	B.5	; Selects buffer 5 as the destination buffer								
	G	; Clears the buffer								
	R53	; Append '5' to the destination buffer								
	T122.2	; Multiply contents of memory location 122 by 5								
	127\$									
	T#5.1	; Subtract the destination buffer from the memory location pointed to by variable #5.								
		<table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding: 5px;">; Before:</td> <td style="padding: 5px;">Variable #5 = 150</td> </tr> <tr> <td style="padding: 5px;">;</td> <td style="padding: 5px;">Location 150 = 1000</td> </tr> <tr> <td style="padding: 5px;">;</td> <td style="padding: 5px;">Destination Buffer = 40</td> </tr> <tr> <td style="padding: 5px;">; After:</td> <td style="padding: 5px;">Location 150 = 960</td> </tr> </table>	; Before:	Variable #5 = 150	;	Location 150 = 1000	;	Destination Buffer = 40	; After:	Location 150 = 960
; Before:	Variable #5 = 150									
;	Location 150 = 1000									
;	Destination Buffer = 40									
; After:	Location 150 = 960									
		<p>; Routine to increment a 6-digit sequence number, padded with leading zeros, upon reaching '999999' roll to sequence number '000001'.</p> <p style="text-align: right;">; increment number</p>								
	128\$									
	B3.3	; Select source and destination buffer 3								
	G	; Clear destination buffer								
	A60	; Append the sequence number								
	I4.2.'999999'	; If not = '999999', then skip 4 else								
	G	; Clear destination buffer								
	R48	; Append zero								
	Z6.48.1	; Pad with zeros up to 6 characters, right justified								
	U60	; Update sequence number								
	G	; Clear destination buffer								
	R49	; Append 1 to destination buffer								
	T60	; Increment sequence number by 1								
	G	; Clear destination buffer								
	A60	; Append sequence number. When you perform an arithmetic operation on a memory location, the padding is lost, so we need to pad for future uses of this number								
	Z6.48.1	; Pad with zeros up to 6 characters, right justified								
	U60	; Update sequence number with padded value								

***T - Specify Communications Timeouts**

***T Specify Communications Timeouts**

Description: Sets the length of various communications timeout periods for dial terminals only. This command works with the current transaction. Once the terminal returns to the idle state, the values return to the default.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network
Category:	Communications Control	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330	"a" not available
	PNC 340	Not available—see page 5-135
	XL	"a" not available
	TRANZ 330	"a" not available in versions prior to 3.6
	TRANZ 330 (202)	Not available—see page 5-135
	TRANZ 340	Not available—see page 5-135
	TRANZ 380	"a" available in versions 1.10 or greater

Command Format:

***Tt1.t2.t3.t4.t5.a**

Parameters:

Parameter	Default Value	Description
t1	45 sec	Optional; carrier detect timeout period; this timeout period begins when the terminal finishes dialing, and ends when the terminal detects a carrier tone; you may specify a timeout period of 1 to 65 seconds; a 0 or blank leaves the value as is. A timeout causes the terminal to display 'NO ANSWER'.
t2	30 sec	Optional; ENQ timeout period; this timeout period begins when the terminal detects carrier tone, and ends when it detects an ENQ; you may specify a timeout period of 1 to 255 seconds; a 0 or blank leaves the value as is. A timeout causes the terminal to display 'NO ENQ FROM HOST'.
t3	45 sec	Optional; response packet timeout period; this timeout period begins when the request packet is sent and ends when the terminal receives the complete response packet; you may specify a timeout period of 1 to 255 seconds; a 0 or blank leaves the value as is. A timeout causes the terminal to display 'NO RESP FRM HOST'.
t4	1 timeout period	Optional; the number of response timeout periods to allow before the terminal hangs up; when the response timeout period is reached, the unit decrements this count, sends an ENQ and waits for a response; if the count reaches zero, the terminal will hangup; the default value for this parameter is 1
t5	2 sec	Optional; EOT timeout period; this timeout period begins when the terminal receives the response packet, and ends when the terminal receives the EOT; you may specify a timeout period of 1 to 255 seconds; a 0 or blank leaves the value as is. Timeout occurs between batch transmit and multitrans as well as standard transactions.
a	0	Optional; End of Text enable/disable 0 - no change 1 - enable EOT timeout 2 - disable EOT timeout

***T - Specify Communications Timeouts**

Example:	Command	Operation
		; This routine is used from the idle control string to wait for input from the keyboard, serial port, or modem. The first control string sets modem default
	981\$	
	*L946	
	+M1.3	; Originate mode 8,N,1
	B.2	; Initialize buffers
	G	
	B.1	
	G	
	P160	; TRANZ - MODEM
	*T	; Set max timeouts
	65	; DCD
	.255	; ENQ
	.255.	; Response packet timeout, default used for number of timeouts
	.255	; EOT
	*P....2	; Set 1200 baud
	L913	; Do setup once, go into idle
	;Idle_lp	; Idle control string - loop
	913\$	
	+A#1	; Test var 1 for current mode
	.0	; Test for equal
	.1	; Equal to 1 (local command mode)
	.2	; Skip carrier check
	+K7.1	; Check for carrier
	L915	; Lost carrier, hang up
	B.1	; Init work buffers
	G	
	B.2	
	G	
	*Y0	; Input vectors, wait forever
	.0	; RDR: Magnetic Cardreader
	.1	; KBD: Keyboard
	.2	; BAR: Bar Code Wand
	.3	; SIO: Serial I/O Port
	.4	; MDM: Modem
	.5	; PIN: PIN Pad
	L	; Idle_Lp - no cardreader input
	L	; Idle_Lp - no keyboard input
	L919	; Bar_hndlr
	L920	; Port_hndlr
	L930	; Mdm_hndlr
	L	; Idle_Lp - no PIN input
	*T30.30.30.1.5	; Set all timeout periods to 30 seconds except for EOT timeout which is to be set at 5 seconds.

***T Specify Communications Timeouts**

Description: Sets the length of various communications timeout periods for polled terminals. (See previous command for dial terminals.)

See Also:	Command	Description
	+I *V	LAN Send and Receive Append LAN Status Code
Category:	Communications Control	

Buffer Status:	Source Buffer	Destination Buffer
	Pointer at end of data if receiving	Buffer updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330	Not available—see previous command
	PNC 340	None
	XL	Not available—see previous command
	TRANZ 330	Not available—see previous command
	TRANZ 330 (202)	None
	TRANZ 340	None
	TRANZ 380	Not available

Command Format:

***Tnu.t1.t2**

Parameters:	Parameter	Default Value	Description
	nu		(not used)
	t1	30 sec	T340/PNC 340 optional; time to complete transmission and receive ZLTP ACK; you may specify a timeout period of 1 to 255 seconds; a 0 or blank leaves the value as is. T330 (202) timer setting for packet transmission attempts.
	t1 (continued)	30 sec	This means if the 202 is either waiting for a free transmit buffer and times out, or is waiting to transmit and times out, the terminal will display 'BAD TX COMM'.

***T - Specify Communications Timeouts**

Parameters (continued)	Parameter	Default Value	Description
	t2	45 sec	Optional; time to wait for response after sending a message; timeout period begins when the request packet is sent and ends when the terminal receives the complete response packet; you may specify a timeout period of 1 to 255 seconds; a 0 or blank leaves the value as is.
Example:	Command	Operation	
	*T.10.60	; Set transmit timeout to 10 seconds ; Set receive timeout to 60 seconds	

+T Characters I/O Over the DIN 6 Port

Description: Sends the transmit buffer to the DIN 6 port for bar code or PIN pad operation. Typical input/output messages include pass characters which are coded in ROM and represent special flag characters used in data communication. A pass character is only valid when parameter "a" = 7. When received, the terminal processes and then acts upon its represented message. Valid pass characters include the following:

Character	Hex	Description
EOT	04h	End of Transmission
ENQ	05h	Enquire
ACK	06h	Acknowledgement
NAK	15h	No acknowledgement
CR	0Dh	Carriage return
vACK	07h	VISA ACK 1
vWACK	11h	Wait ACK
vWAIT	12h	VISA wait

Special host communication characters used when logging into several different hosts and networks:

@	40h
:	3Ah
=	3Dh
~	7Eh
XON	11h

See Also: **Command** **Description**

*H	Encrypt PIN
+H	Wait for PIN
+U	Set DIN 6 Parameters

Category: Communications Control

Buffer Status: **Source Buffer** **Destination Buffer**

No change	No change; buffer read
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Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Not available
TRANZ 330/340	Available on versions 2.1 or greater
TRANZ 380	None

+T - Characters I/O Over the DIN 6 Port

Command Format:

+Ta.t.s.n

Parameters:

Parameter	Default Value	Description
a	0	<p>Optional; options for this parameter are:</p> <p>Transmitting data:</p> <p>0 send transmit buffer 1 append termination character TERMCHAR (set with *P command) and LRC, then send the transmit buffer</p> <p>Receiving data:</p> <p>5 wait for number of characters specified in "n" parameter to be received, append it to the destination buffer 6 wait for 1 character or packet to be received, append it to destination buffer; if STX received wait for packet 7 wait for pass character or packet or; retransmit last data if NAK received, append receive character or packet to the destination buffer. (See also *I command for pass characters.)</p>
t	0	Optional; timeout period in seconds (receive only): 0 wait forever 1-255 number of seconds to wait If the unit times out, the destination buffer remains unchanged.
s	0	Optional; number of commands to skip if received data (applies to receive only)
n	1	Optional; number of characters to wait before appending characters to destination buffer; this parameter applies only when "a" parameter = 5 (receive data only).

Examples:

Command	Operation
; This routine changes the idle prompt on the PIN Pad display	
; change PIN Pad	
313\$	
*W1	; Wait one second
B.1	; Select transmit buffer as destination buffer
G	; Clear destination buffer
R2	; Append a "STX" char to the buffer
R'Z8'	; Reset/Set idle prompt command
A#2	; Append new idle prompt

Examples: (continued)	Command	Operation
	B1.2	; Source = transmit buffer ; Destination = receive buffer (response from ; PIN Pad will be here)
	G	; Clear destination buffer
	+T1	; Append termination character and send ; transmit buffer
	+T7.15	; Wait for packet or a 'pass character' (expecting ; an ACK) retransmit last data if receive NAK ; append receive character or packet to the ; destination buffer timeout period is 15 seconds
	*W2	; Wait a couple seconds
	*M	; Return

U - Copy Buffer to a Memory Location

U Copy Buffer to a Memory Location

Description: Copies the contents of a specified buffer to a memory location, overwriting any data in the memory location.

See Also:	Command	Description
	B	Select Buffers
	D	Delete Characters from Buffer
	G	Clear Destination
	H	Search for String
	+J	Buffer Modification
	O	Move Extraction Pointer
	+S	Get Buffer Size
	V	Display Buffer
	Z	Pad Destination Buffer
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer read
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

Um.b

Parameters:	Parameter	Default Value	Description
	m	000	Optional; three-digit memory location into which the buffer will be copied; the default is location 000
	b	0	Optional; the buffer to be copied; the default, 0, selects the current destination buffer; other buffer options include: 0 current destination buffer 1 Buffer #1 - Transmit Buffer 2 Buffer #2 - Receive Buffer 3 Buffer #3 - Data Capture Buffer 4 Buffer #4 - Print Line Buffer 5 Buffer #5 - Temporary Buffer

Examples:	Command	Operation
		; Routine to increment a 3-digit batch number, padded with leading zeros, ; upon reaching '999' roll to sequence number '001'.
	B3.3	; Select source and destination buffer 3
	G	; Clear destination buffer
	A61	; Append the batch number
	I3.2.'999'	; If not = '999', then skip 3 else
	G	; Clear destination buffer
	R48	; Append zero
	U61	; Update batch number
	G	; Clear destination buffer
	R49	; Append 1 to destination buffer
	T61	; Increment batch number by 1
	G	; Clear destination buffer
	A61	; Append batch number. When you perform ; an arithmetic operation on a memory location, ; the padding is lost, so we need to pad for future ; uses of this number
	Z3.48.1	; Pad with zeros for up to 6 characters, right ; justified
	U61	; Update batch number with padded value

***U - Bar Code Reader Input**

***U Bar Code Reader Input**

Description: Causes the terminal to accept input from the bar code reader, appends data to the destination buffer if a bar code is read, and skips the specified number of commands. See Appendix J for use with industrial terminals.

If you press a key before a bar code is read, the terminal executes the next TCL command looking for "E" or "K" commands to take the data.

Note: Verify that the bar code wand is selected as the DIN 6 peripheral, location 970.

See Also:	Command	Description
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E	Input from Card Reader or Keypad
+E	Input Variable Decimal Point
K	Input from Keypad Only
M	Input from Card Reader Only
*Y	Check Input Devices

Category: Data Entry

Buffer Status:	Source Buffer	Destination Buffer
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No change	Buffer updated
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Terminals Supported:	Terminal	Special Conditions
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PNC 330/340	Not available
XL	Not available
TRANZ 330	Not supported in version 3.60; s2 not available Pressing [CLEAR] after bar code data is read, but before *U command is executed disables further bar code reads. To re-enable, power cycle unit or run bar code reader test in the Diagnostics mode. <i>Also applies to ZON 53x industrial terminals.</i>
TRANZ 330 (202)	S2 not available
TRANZ 340	S2 not available
ZON 53X/54X	S2 available on industrial terminals only
TRANZ 380	S2 not available

Command Format:

***Us.a1.a2.S2**

Parameters:

Parameter	Default Value	Description
s	none	Optional; the number of commands to skip when a valid bar code is read; if a key is pressed before the bar code is read, the terminal will execute the next instruction. <i>Note: The programmer must use a "K" command to accept and process the keyboard entry.</i>
a1	0	Optional; Bar code algorithm 0 = 3 of 9.
a2	0	Optional; Luhn check digit used to ensure input data is valid; the default is 0, no check digit; check digit options include: 0 no check digit performed by "*U" itself 1 Luhn check digit for code 39 if data is totally numeric. Only available if "*Y" does not logically precede "*U". <i>Note: Standard code 39 mod 43 check sum to be implemented at a future date, but not from this parameter.</i>
s2	0	Optional; ZON 53x/54x only (TRANZ 330/340 industrial counterpart); number of commands to skip on a bad bar code read. See Appendix J.

Example:

Command	Operation
; This routine accepts input from the bar code wand or keyboard. It will also ; check the Luhn check digit of a bar code in code 39 symbology, excluding ; the first character which is alphabetic.	
970=1	; Set flag to indicate bar code wand attached
113=SCAN BAR CODE	
144\$	
B3.3	; Select source and destination buffer
G	; Clear destination buffer
P113	; Display "SCAN BAR CODE"
*U	; Accept input
I4.1.28	; If keyboard entry, skip 4
*L145	; Verify Luhn Check Digit
D	; Delete field separator at end
U97	; Store number
L	; Get next bar code
K3.10.1	; Accept keyboard input, quit if [ENTER]
I-5	

***U - Bar Code Reader Input**

Example: (continued)	Command	Operation
	145\$ B3.4 G O X C1 B3 G X	; Select source and destination buffer ; Clear destination buffer ; Move extraction pointer past alpha character ; Copy rest of number ; Verify Luhn check digit on destination buffer ; Reset source buffer extraction pointer ; Clear destination buffer ; Copy number into destination buffer
Industrial Example: (see Appendix J)	Command	Operation
	;	This routine allows the terminal to display the bad bar code and an appropriate error message.
	607\$ B.3 G P113 *U1..0.3 K3.10.1 V.2.2 I3 V.2.2 P120 *K1 *K 120=BAD BAR CODE 604 = 9	; Select buffer 3 ; Clear 3 ; Display "SCAN BAR CODE" ; Skip 1 on bar code read, no check skip 3 on bar code ; Keyboard input ; Display buffer ; Skip 3 ; Display bad bar code ; display error message "BAD BAR CODE" ; Halt transaction

+U Set DIN 6 Communication Parameters

Description: Sets the data speed (baud rate) and format of the DIN 6 port.

Note: Be sure to select "General Communication Device" for the DIN 6 peripheral in memory location 970.

*If the memory location was changed with the U command, *K (abort) must be re-executed to put it in effect.*

See Also:	Command	Description
	*H	Encrypt PIN
	+H	Wait for PIN
	+T	Send over DIN 6
Category:		Communications Control
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	Options 4 and 5 of a1 not available
	XL	Not available
	TRANZ 330	Available on versions 2.0 or greater, except options 4 and 5 of a1
	TRANZ 330 (202)	Available on versions 2.1 or greater, except options 4 and 5 of a1
	TRANZ 340	Available on versions 2.1 or greater, except options 4 and 5 of a1
	TRANZ 380	None

Command Format:

+Ua1.a2

+U - Set DIN 6 Communication Parameters

Parameters:

Parameter	Default Value	Description
a1	0	Optional; baud rate 0 = 300 (set to 1200 baud on abort) 1 = 600 2 = 1200 3 = 2400 4 = 4800 5 = 9600
a2	0	Optional; data format 0 no change (set to 7E1, pass 7 on abort) 1 set 7E1, pass 7 bits 2 set 8N1, pass 7 bits 3 set 8N1, pass 8 bits

Example:

Command	Operation
+U2.1	; Set DIN 6 port to 1200 baud, 7E1

V Display Buffer

Description: Makes the terminal display the contents of a specified buffer.

Note: Pressing [CLEAR] while buffer contents are displayed aborts the control string and returns the terminal to the idle state.

Special Consideration: The control character 26 decimal (1A hex or ^Z) is interpreted by the display control driver in the XL/TRANZ as a 'clear display' command. If the "V" command is used to display a buffer that contains this control character, only the information following the 1Ah will be visible on the display. For example, if "V" is used to display a buffer containing "123"1Ah"456", only "456" will appear on the display.

See Also:	Command	Description
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Display Commands:

F	Display Fixed Prompt
*J	Justify Display
P	Display Custom Prompt

Buffer Commands:

B	Select Buffers
D	Delete Characters from Buffer
G	Clear Destination
H	Search for String
+J	Buffer Modification
O	Move Extraction Pointer
+S	Get Buffer Size
U	Copy Buffer to Memory Location
Z	Pad Destination Buffer

Category: Outputs and Data Display

Buffer Status:	Source Buffer	Destination Buffer
No change		No change; buffer read/updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	[BACKSPACE] returns terminal to idle state in version 2.60
	TRANZ 330	[BACKSPACE] returns terminal to idle state in version 3.10
	TRANZ 340	[BACKSPACE] returns terminal to idle state in version 2.30
	TRANZ 380	None

V - Display Buffer

Command Format:

Vb.a.t

Parameters:	Parameter	Default Value	Description
	b	0	Optional; the buffer to be displayed; default is current destination buffer; other options include: 0 current destination buffer 1 Buffer #1 - "Transmit Buffer" 2 Buffer #2 - "Receive Buffer" 3 Buffer #3 4 Buffer #4 5 Buffer #5
	a	0	Optional; the options are: 0 Display buffer contents, allow scrolling and wait for [ENTER], then execute next command in the control string. 1 Display buffer, allow scrolling and multi-host change
	t	0	2 Display buffer; wait for keypress or "t" half-seconds, specified in parameter 3; then execute next command in the control string Optional; number of half-seconds to display the buffer contents before executing the next command; this parameter is only valid when the "a" parameter is equal to 2

Note: To perform the multiple-transactions function, each transaction key must be assigned to the same host and have the same multi-transaction group code in location X12 (X = number on the transaction key). For example, for transaction keys 4 and 7, memory locations 412 and 712 must have the same value. If they don't have the same value, the terminal will dial the host for each transaction rather than performing both transactions on the same dial up.

Caution: Do not use the V.1 command in location X10 (X = number on the transaction key). This will result in an execution error.

Example:	Command	Operation
	; This routine prompts for an [ENTER] key to continue	
190\$		
	B.4	; Select destination buffer
	G	; Clear destination buffer
	R'ENTER=CONTINUE'	
		; Append "ENTER=CONTINUE" to buffer
	V	; Display buffer and wait until the [ENTER] key ; or [CLEAR] key is pressed
		; This next routine assumes that transaction 5 and transaction
		; 7 can be done in the same phone call (multi-transaction)
		; Set 512 = 712 = 1
	511 = V2.1	; Display the destination buffer ; User will scroll or select transaction 7 as the ; next transaction.

***V - Append Telephone Status Code**

***V Append Telephone Status Code**

Description: The "**V" command appends a code, which identifies the status of the telephone, to the destination buffer. This command is used when writing custom communication routines and for determining the status of the telephone line connected to the terminal. The appended code depends on whether or not the concurrent dialer has been started with an "S" command.

Status codes are described below. Codes 1, 2, 6, 7, and 8 are dialer status.

Code	Description
1	The phone is off hook.
2	The phone is off hook and carrier is present.
3	The phone is on hook and a phone line is present.
4	No phone line is present or the parallel phone is off hook.
5	The phone is on hook and there is an incoming ring.
6	The phone is on hook, waiting for line
7	The phone is off hook, dialing
8	The phone is off hook, waiting for answer

Note: Time required to return the status code will vary from one code to the next. This command as described is applicable only for dial terminals. See "V Append LAN Status Code" for poll terminals.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	+X	Transmit Data to Network
	+Y	Receive Data from Network

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330	None
	PNC 340	Not available—see page 5-152
	XL	Return codes 6, 7, and 8 not implemented
	TRANZ 330	None
	TRANZ 330 (202)	Not available
	TRANZ 340	Not available—see page 5-152
	TRANZ 380	None

Command Format:	*V		
Parameters:	Parameter	Default Value	Description

(there are no parameters for the *V command)

Example:	Command	Operation
	B3.3 G *V I-3.2.'3'	; Wait until the phone goes on hook. The following example demonstrates ; the use of the "*V" command: ; Select buffer 3 for both the source and ; destination buffer ; Clear the destination buffer ; Get phone status and append it to the ; destination buffer ; Skip backwards if the status code is not "3" ; (phone on hook with no incoming ring)

***V - Append LAN Status Code**

***V Append LAN Status Code**

Description: The "*V" command appends a code, which identifies the status of the LAN, to the destination buffer and can be used anytime during a transaction. The status codes are described below:

Code	Description
0	Okay; terminal is on-line
1	Invalid poll ID
2	Too many LAN errors due to incompatible baud rate or wiring error
3	No polls received
4	LAN disconnected

See Also: **Command** **Description**

+I	LAN Send and Receive
*T	Specify Communications Timeout

Category: Communications Control

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer updated
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Terminals Supported: **Terminal** **Special Conditions**

PNC 330	Not available—see command, page 5-150
PNC 340	None
XL	Not available—see command, page 5-150
TRANZ 330	Not available—see command, page 5-150
TRANZ 330 (202)	Not available
TRANZ 340	None
TRANZ 380	Not available

Command Format:



Parameters:	Parameter	Default Value	Description
(there are no parameters for the *V command)			
Example:	Command	Operation	
; Wait until the LAN status is okay. The following ; example demonstrates the use of the "*V" command:			
B3.3		; Select buffer 3 for both the source and destination ; buffer	
G		; Clear the destination buffer	
*V		; Get LAN status and append it to the destination ; buffer	
I-3.2.'0'		; Skip backwards if the status code is not "0"	

+V - Append Signon Message to Buffer

+V Append Signon Message to Buffer

Description: Appends the firmware release version (signon message), the EPROM Permanent Terminal ID Number, or the terminal RAM configuration to the destination buffer.

See Also:	Command	Description
	A	Append from Memory Location
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	R	Append Constant
	X	Append from Source
	Y	Append Non-Blank Memory Location
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	Available on versions 2.4 or greater
	TRANZ 330	Available on versions 1.4 or greater
	TRANZ 330 (202)	Available on versions 2.1 or greater
	TRANZ 340	Available on versions 2.1 or greater
	TRANZ 380	Available on versions 1.10 or greater
Command Format:	+Va	
Parameters:	Parameter	Default Value
	a	0
		Select desired option. 0 = Signon message TRANZ 380 only: 1 = EPROM Permanent Terminal ID Number 2 = RAM configuration in Kbytes. This number appears as "64" or "128" in the destination buffer.
		<i>Note: Not all versions of the TRANZ 380 support a Permanent Terminal ID Number, nor do all countries require it.</i>

+V - Append Signon Message to Buffer

Examples:	Command	Operation
	B.3	; Select buffer
	G	; Clear buffer
	+V	; Append to destination buffer
	V.2.2	; Display message and continue

W - Wait Until Print Buffer is Empty

W Wait Until Print Buffer Is Empty

Description: The "W" command causes the terminal to wait until all the characters sent to the printer are printed before executing the next command in the control string. The printer buffer length is 250 characters.

See Also:	Command	Description
<i>Printing:</i>		
	N	Send Buffer to Printer
<i>Wait Commands:</i>		
	+P	Timeout in Milliseconds
	*W	General Wait

Category: Process and Flow Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	W ₁ and W ₂ available on versions 2.10 or greater
	TRANZ 330 (202)	"s" parameter available on versions 2.1 or greater
	TRANZ 340	"s" parameter available on versions 2.1 or greater
	TRANZ 380	None

Command Format:

Wa.s

Parameters:

Parameter	Default Value	Description
a	0	Optional; options for this parameter are: 0 wait until print buffer is empty 1 skip number of commands specified in parameter 2 if printer is ready 2 skip number of commands specified in parameter 2 if print buffer is empty
s	0	Optional; number of commands to skip if parameter 1 ("a") = 1 or 2.

Note: Option 1 of parameter "a" is implemented only for the Printer 100. If the printer type flag is sent for any other printer, the terminal will always think the printer is ready.

Example:

Command	Operation
; This routine prints the heading	
380\$	
B.4	; Select destination buffer
G	; Clear destination buffer
A70	; Append merchant name
Z40.2	; Center it
N1	; Print
G	; Clear destination buffer
A71	; Append merchant address
Z40.2	; Center it
W	; Make sure the printer buffer doesn't overflow
N1	; Print
G	; Clear destination buffer
A72	; Append merchant city, state, zip code
Z40.2	; Center it
W	; Make sure printer buffer doesn't overflow
N2	; Print and skip one line
G	; Clear destination buffer
R'DATE: '	; Append "DATE: "
J'B/C/A'	; Append "MM/DD/YY"
Z22	; Pad up to 22 spaces, left justified
R'TIME: '	; Append "TIME: "
J'K:E:F'	; Append "HH:MM:SS"
W	; Make sure printer buffer doesn't overflow
N1	; Print line

*W - General Wait

*W General Wait

Description: The "*W" command is a general wait command. It causes the terminal to wait for either a specified number of seconds or until the user presses a key. The key is then appended to the destination buffer.

See Also: **Command** **Description**

+P	Timeout in Milliseconds
W	Wait for Print Buffer

Category: Process and Flow Control

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer updated
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Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Options 2 and 3 of parameter "a" not implemented. Entering any value other than "0" causes the command to function as though the parameter is "1".
TRANZ 330	Double key entries not accepted, regardless of value of "a" parameter in version 3.10
TRANZ 340	Double key entries not accepted, regardless of value of "a" parameter in version 2.30
TRANZ 380	None

Command Format:

*Wt.s.a

Parameters: **Parameter** **Default Value** **Description**

t	0	Optional; timeout period in seconds; you may specify a timeout of 1-65 seconds; if set to zero, the terminal will not timeout; it will wait for a key press before executing the next command.
---	---	--

s	0	Optional; number of instructions to skip when the terminal times out or receives a keypress
---	---	---

Parameters: (continued)	Parameter	Default Value	Description
	a	0	<p>Optional; the type of key press allowed, key pressed is appended to the end of the destination buffer;</p> <p>0 allow 0 - 9, *, # 1 allow 0 - 9, *, #, [ENTER]</p> <p><i>Note: Pressing [ENTER] causes the terminal to timeout and skip the number of instructions specified by "s" parameter.</i></p> <p>2 allow 0-9, *, # return B for [BACKSPACE] C for Alphanumeric D for [ENTER]</p> <p>3 disallow any keys</p>

Examples:	Command	Operation
	<pre>; This routine gets the price per gallon with 3 decimal places 318\$; PRICE PER GALLONS B5.5 ; Select buffer 5 G ; Clear 5 P55 ; Say 'PRICE PER GALLN?' +E2.5.0 ; Accept price/gallon 999.99 U155 ; Store the price H3.45 ; check for negative P70 ; Display 'NEG NOT ALLOWED' *W1 ; Wait 1 second I-8 ; Go back and get input B.4 ; Select 4 G ; Clear 4 R48 ; Append a zero T155 ; And add it to field to remove the decimal B5.5 ; Move the input to source I1.1.'0.00' ; If price is empty return *L319 ; Otherwise prompt for gallons</pre>	

X - Append Source Buffer to Destination Buffer

X Append Source Buffer to Destination Buffer

Description: Appends a specified number of characters from the source buffer to the end of the destination buffer. Following this operation, the extraction pointer will point to the position following the last copied character. The data extraction pointer may be set with the following commands:

- "B" select buffer and reset pointer
- "H" search and set pointer
- "O" offset pointer

See Also:	Command	Description
	A	Append from Memory Location
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	R	Append Constant
	+V	Append Sign On Message
	Y	Append Non-Blank Memory Location

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	Pointer moves n positions; buffer read	Buffer updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Command Format:

Xn.c

X - Append Source Buffer to Destination Buffer

Parameters:	Parameter	Default Value	Description
	n	0	Optional; number of characters to copy; if default value 0 is specified, terminal will copy from extraction pointer to end of source buffer
	c	rest of buffer	Optional; the end sentinel which is a decimal value; upon encountering the end sentinel, the terminal stops copying; if not specified, the terminal copies to the end of the source buffer. For example, if the end sentinel is 28 (the decimal value for an ASCII field separator) and you write the command X.28, the terminal will copy up to, but not including, the next field separator.
Example:	Command	Operation	
		; This routine is called after we receive a response message back from the host and we want to extract the display message and display it. The display message in this particular host response is after the first field separator.	
	168\$		
	B.2	; Select receive buffer which contains the host response	
	U190	; Save the entire host response	
	B2.3	; Select the receive buffer as the source buffer and 3 as the destination buffer	
	H	; Find the first field separator in the host response	
	O	; Move the extraction pointer by 1	
	X16	; Copy the 16-character display message	
	V.2.4	; Display the message for 2 seconds before continuing	

*X - Select Account Number Range

*X Select Account Number Range

Description: Allows you to specify a series of account ranges to indicate which account numbers the terminal will accept.

If the digits of the data in the source buffer fall within the lowest entry permitted and highest entry permitted—see the Account Range Table on the next page—the terminal will append a data field to the destination buffer, and skip the number of commands specified in the last parameter of the "*X" command. If the digits do not fall within any of the account ranges specified, the terminal will execute the command immediately following the "*X" command.

Note: The portion of information in the data field of each account range record that will be copied to the destination buffer can be limited by either a ',', '.', or ';' in the data field. The information following such a terminator/field separator can be considered a comment field.

WARNING: Do not use memory locations with a range of over 255 for "m₁" and "m₂" parameters.

See Also: **Command** **Description**

+A	Compare Variable
+C	Buffer Comparison
I	Comparison Operator

Category: Data Entry

Buffer Status: **Source Buffer** **Destination Buffer**

No change	Buffer updated
-----------	----------------

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Available on versions 2.5 or greater
TRANZ 330/340/380	None

Command Format:

*Xm₁.m₂.S

Parameters:

Parameter	Default Value	Description
m1	40	Optional; the memory location of the first account range to use from the account range table. (Range 0-255)
m2	59	Optional; the memory location of the last account range to use from the account range table. (Range 0-255)
s	0	Optional; the number of commands to skip if the first digits of the account number fall within the series of account ranges specified by parameter 1 and 2.

Note: The account ranges used are a series of consecutive memory locations called the Account Range Table. Each account range specifies the lowest and highest account number it will accept. The account range also has a data field that will be appended to the destination buffer if the account number falls within the range.

Examples: In these examples, we will use the following Account Range Table. The data field material presented is optional. If you don't use this information, be sure to include the period following the second entry (for example, 40=4000.4999.).

Memory Location	Lowest Entry Permitted	Highest Entry Permitted	Data Field
-----------------	------------------------	-------------------------	------------

Beginning of Account Range Table

40 =	4000 .	5000 .	VISA
41 =	6000 .	6999 .	DISC
42 =	34 .	38 .	MIDDLE THREE
43 =	3000 .	3999 .	ALL THREE
44 =	<empty>		

End of Account Range Table

80	NOT RANGED
----	------------

*X - Select Account Number Range

*Note: Although the default for parameter 2 is memory location 59, if the terminal encounters an empty memory location in the Account Range Table (in this example, location 44) before it reaches the last account range, the terminal will terminate the "*X" command and execute the next command. See Example 3.*

Command	Operation
100=9	
104=9	
107\$	
B5.5G	; Select buffer 5 and clear it
G	
F1	; Display 'ENTER ACCOUNT NUM'
E	; Accept entry from cardreader or keypad
D	; Delete field separator at end
B.4	; Select buffer 4 as the destination buffer and clear it
G	
*X..1	; Range the source buffer, skip 1 command if ranged
A80	; Append 'NOT RANGED' to the destination buffer, ; Wait for ENT to continue
*W..1	
L	; Re-execute this control string

- Example 1: If the user enters 4212 123 456 789, the terminal will see that the first four digits of the number (4212) will fall between the range 4000-5000. It will then append the third data field "VISA" to the destination buffer and skip one command.
- Example 2: If the user enters 3000 123 456 789, the terminal will see that the account number does not fit within the first three account ranges, but it does fit the fourth. The terminal will then append "ALL THREE" to the destination buffer and skip one command.
- Example 3: If the user enters 20, which does not fit anywhere in the Account Range Table, the terminal will execute command A80 immediately following the "*X" command.
- Example 4: If the user enters 68, the terminal will then see that the account number fits within the second range, and will append 'DISC' to the destination buffer.

+X Transmit Data to the Network

Description: Transmits data to the network in the format of one or more characters contained within single quotes, or a decimal value not contained in quotes. Use this command to pass the four parameters of a login string, such as the user name, user password, user location, and location password. See Appendix I for login string information.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+Y	Receive Data from Network

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

Terminals Supported: **Terminal** **Special Conditions**

PNC 330	None
XL	Available on 2.70 and greater
TRANZ 330	Available on 3.40 and greater
TRANZ 380	None

Command Format:

+Xc.a1.a2

+X - Transmit Data to the Network

Parameters:

Parameter	Default Value	Description
c	0	Data to send. This may be represented as a string of characters within single quotes or a decimal value. Use this parameter to send a <CR> or message. If used with <login parameter>, this data will follow the login parameter data. The default setting to send nothing is "0".
a1	0	Login parameter to send. This allows you to select one of the following: 0 no parameter selected (default) 1 user name selected (or 1st parameter from login parameters) 2 user password selected (or 2nd parameter from login parameters) 3 user location selected (or 3rd parameter from login parameters) 4 location password selected (or 4th parameter from login parameters) If used with <data>, the login parameter data will be sent preceding the value(s) in <data>.
a2	0	Sends a space break to the modem. Entering "1" causes a space break and all other parameters will be ignored. "0" is the default, indicating no space break.

Examples:

Command	Operation
240\$ +P2000 +X13 +Y58.21000.1.1 *W1 +X44 +X13.1 +P100 I1 *K1	; Wait 2000 mls (2 seconds) ; Transmit a <CR> ; Wait for ':' for 1/2 second, retries, ; display host message and skip 4 ; commands if no receive ; Pause ; Transmit a ':' ; Transmit <username> <CR> ; Skip 1 on good response ; Else kill the display

Y Append Non-Blank Location

Description: Appends the contents of the first non-blank memory location to the destination buffer. Subsequent use will append the next non-blank memory location to the destination buffer.

The terminal begins reading at memory location 000, and can read up to memory location 999 in the PNC 330/340, and TRANZ 330/340, up to memory location 1999 in the TRANZ 380, and memory location 912 in the XL. If the "Y" command appears in a loop, the memory location numbers will automatically increment until all the non-blank memory locations have been read. The "Y" command is ideal for performing a memory dump, and can serve as a diagnostic tool, reading the data stored in each of the terminal's memory locations.

If the contents of a non-blank location contain control characters, this command converts the control characters to actual printable characters before appending to the buffer.

Examples:

99 = 12345<FS><FS> (Actual data in memory location)
99 = 12345^\\ (Printable data in buffer)

The memory location data is appended to the destination buffer in the format: XXX DDD, CR LF

XXX Memory location number
DDD Data contained at the location
CRLF Carriage return/line feed

See Also:	Command	Description
	A	Append from Memory Location
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	R	Append Constant
	+V	Append Sign On Message
	X	Append from Source

Category: Buffer Operations

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	None
	XL	None
	TRANZ 330/340/380	None

Y - Append Non-Blank Location

Command Format:

Ys

Parameters:

Parameter	Default Value	Description
s	0	Optional; number of commands to skip after all non-blank memory locations have been read

Example 1:

Command	Operation
Y2	; Print the contents of all non-blank memory locations and skip two commands after printing.

Example 2:

G	; The following shows the "Y" command in context with other TCL commands.
Y2	; clear the destination buffer
	; append a memory location
	; after all memory locations have been read,
	; skip 2 commands
N	; print the destination buffer
I-3	; loop back 3 commands (back to G)

***Y Check Input Devices**

Description: Checks to see if there is data from any input device, and then branches to a control string that can process the data and append it to the destination buffer. This command is a general scan of all peripheral devices. See Appendix J for use in conjunction with "*U" command for industrial terminal applications.

Note: This command does not append the data to the destination buffer, but just informs the application that a specific device has data. The application program must execute the appropriate command to get the data from that same device.

See Also:

Command	Description
E	Input from Card Reader or Keypad
+E	Input Variable Decimal Point
K	Input from Keypad Only
M	Input from Card Reader Only
*U	Input from Bar Code Reader

Category: Data Entry

Buffer Status: **Source Buffer** **Destination Buffer**

Source Buffer	Destination Buffer
No change	No change

Terminals Supported: **Terminal** **Special Conditions**

Terminal	Special Conditions
PNC 330	None
PNC 340	"s5" parameter not available
XL	Not available
TRANZ 330	"3" parameter not available in version 3.60 and greater
TRANZ 330 (202)	"s5" parameter not available
TRANZ 340	"s5" parameter not available
TRANZ 380	None

Command Format:

***Yt.S1.S2.S3.S4.S5.S6**

*Y - Check Input Devices

Parameters:	Parameter	Default Value	Description
	t	0	Optional; number of seconds to wait for data from a device. Default value 0 sets up terminal to wait indefinitely until it receives data.

The following parameters indicate the number of commands to skip when the terminal receives input from one of the following devices.

S1	cardreader
S2	keypad
S3	bar code wand
S4	RS-232 port
S5	modem
S6	PIN Pad

Note: Parameter "s3" is not available in version TRANZ 3.60 and greater.

Examples:	Command	Operation
	<pre>; This routine is used from the idle control string to wait for ; input from the keyboard, serial port, or modem. The first ; control string sets defaults for the modem. 981\$ *L946 +M1.3 ; Originate mode 8,N,1 B.2 ; Initialize buffers G B.1 ; G P160 ; TRANZ - MODEM *T ; Set max timeouts 65 ; DCD .255 ; ENQ .255. ; Multi-transaction .255 ; EOT *P....2 ; Set 1200 baud L913 ; Do setup once, go into idle ;idle_lp ; Idle control string - loop 913\$ +A#1 ; Test var 1 for current mode .0 ; Test for equal .1 ; Equal to 1 (local command mode) .2 ; Skip carrier check +K7.1 ; Check for carrier L915 ; Lost carrier, hang up B.1 ; Init work buffers G B.2 G</pre>	

Examples: (continued)	Command	Operation
	*Y.0.1.2.3.4.5	; Input vectors, wait forever ; RDR: Magnetic Cardreader input skip 0 ; KBD: Keyboard input skip 1 ; BAR: Bar Code Wand input skip 2 ; SIO: Serial I/O port input skip 3 ; MDM: Modem input skip 4 ; PIN: PIN Pad input skip 5
	L	; Re-execute control string - cardreader
	L	; Re-execute control string - keyboard
	L919	; BAR_hdlr
	L920	; Port_hdlr
	L930	; Mdm_hdlr
	L	; Re-execute control string - PIN Pad

Note: When the Operating System is checking all of the devices, there is a definite order in which they are checked:

1. *Card Reader*
2. *Keypad*
3. *Bar Code Reader*
4. *RS-232*
5. *Modem*
6. *PIN Pad*

+Y - Receive Network Data Within Timeout

+Y Receive Network Data Within Timeout

Description: Receives data from a network until a timeout has expired, or the correct termination character has been received. The displayed data will show the right- or left-most 16 characters.

When the skip command is used it will skip "x" number of commands if the wrong character is received or timeout occurs.

If the data is not received within the timeout or number of tries, the system will display the error message "NO x FROM HOST" where x is the value contained in the data parameter.

Warning: Use the "+Y" command with care as it will clear any data in the circular modem receive buffer.

See Also:	Command	Description
	+D	Tone Dial
	+F	Response ACK
	+I	Send Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network

Category: Communication Control

Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer read/updated

Terminals Supported: **Terminal** **Special Conditions**

PNC 330/340	None
XL	Available on 2.70 and greater
TRANZ 330	Available on 3.40 and greater
TRANZ 380	None

Command Format:

+Yc.t.n.a.s

Parameters:

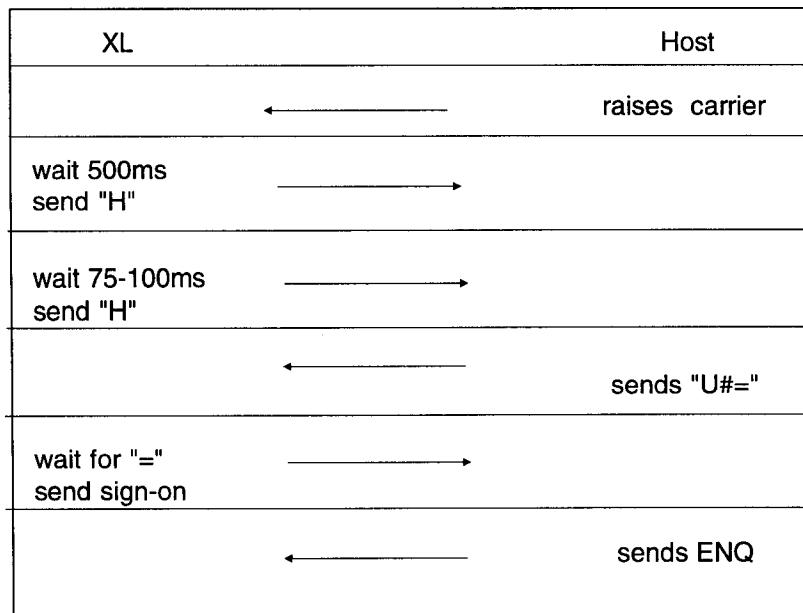
Parameter	Default Value	Description
c	13	Data to match. This may be represented as a character within single quotes or a decimal value. The default is a decimal 13, which is a <CR>. Use this command to wait for a termination character from the network.
t	30000	Amount of time to wait in milliseconds. 1000 milliseconds = 1 second. Valid values can range from 1 to 30000. If any other value is used, it will revert to the default.
n	1	Number of tries to get the single character the system is looking for. Valid values can range from 1 to 255.
a	0	Displays or does not display characters received up to the termination character. Entering "0" tells the terminal not to display any characters. Entering "1" tells the terminal to display the right-most 16 characters. Entering "2" tells the terminal to display the left-most 16 characters.
s	0	Number of commands to skip forward or backward based on no data receipt. Use this parameter for retry purposes: enter "1" to skip forward one command or "-1" to skip backward one command.

Example:

Command	Operation
+Y	; Wait 30 seconds or until a <CR> is received and ; don't display the data.
+Y52.20000.1	; Wait 20 seconds or until a "*" is received and ; display the data right-most justified.

+Y - Receive Network Data Within Timeout

Login String ; GEISCO — login through the GEISCO network then returns
Example: ;
; GEISCO login dialogue:



Sign-on = "<user name>,<password>,<PID>,<RID><CR>"

Assume userID = "HAPPY", password = "123456", PID = 222, and RID = 333, or, 020=455-HAPPY-123456-222-333

```
455$          ; Do login
+P500         ; Delay 500 ms
+X72          ; Transmit an "H" (decimal 72)
+P100         ; Delay 100 MS
+X'H'         ; Transmit an "H"
+Y61          ; Wait for an = sign from host (U#=)
+X44.1        ; Transmit HAPPY followed by a comma (,)
+X44.2        ; Transmit 123456 followed by a comma (,)
+X44.3        ; Transmit 222 followed by a comma (,)
+X13.4        ; Transmit 333 followed by a <CR>
```

Z Pad Destination Buffer

Description: Pads the destination buffer to a specified length, by adding a specified character.

See Also:

Command

Description

B	Select Buffers
D	Delete Characters from Buffer
G	Clear Destination
H	Search for String
+J	Buffer Modification
O	Move Extraction Pointer
+S	Get Buffer Size
U	Copy Buffer to Memory Location
V	Display Buffer

Category: Buffer Operations

Buffer Status:

Source Buffer

Destination Buffer

No change	No change; buffer updated
-----------	---------------------------

Terminals Supported:

Terminal

Special Conditions

PNC 330/340	None
XL	None
TRANZ 330/340/380	None

Command Format:

Zn.C.a

Parameters:

Parameter

Default Value

Description

n	none	Required; the desired length of the buffer; this parameter has no default value
---	------	---

c	ASCII 32	Optional; the ASCII decimal character used to pad the buffer; the default is 32 (space character); if none is specified, space is assumed
---	----------	---

a	0	Optional; a code indicating the type of justification to be used; the default value is 0, left justification; justification options include: 0 left justification (data flush left, pad characters on right) 1 right justification (data flush right, pad characters on left) 2 center (center data, pad left and right)
---	---	---

Z - Pad Destination Buffer

Example:	Command	Operation
	Z12.48.1	; Pad the destination buffer with zeros to a length ; of 12 characters, and right justify the original ; amount.
	Z20	; Pad the destination buffer with spaces to a length ; of 20 characters, left justified.
		; A routine called to print the header on the receipt which contains the ; merchant address information on a 26-column slip printer.
	550\$	
	B.5	; Select buffer 5 to work in
	G	; Clear destination buffer
	A85	; Append merchant name
	Z26.2	; Center it
	N1	; Print
	G	; Clear destination buffer
	A86	; Append merchant address
	Z26.2	; Center it
	W	; Make sure printer buffer doesn't overflow
	N1	; Print
	G	; Clear destination buffer
	A87	; Append Merchant city, state, zip code
	Z26.2	; Center it
	W	; Make sure printer buffer doesn't overflow
	N2	; Print and skip one line

***Z Calculate Free Bytes**

Description: Calculates the number of free bytes left in RAM and appends the number to the destination buffer.

See Also:	Command	Description
	+S	Get Buffer Size
	*S	Get Memory Size
Category:	Buffer Operations	
Buffer Status:	Source Buffer	Destination Buffer
	No change	No change; buffer updated
Terminals Supported:	Terminal	Special Conditions
	PNC 330/340	"a" not available
	XL	"a" not available
	TRANZ 330/340	"a" not available
	TRANZ 380	"a" available in versions 1.10 and greater

Command Format:

***Za**

Parameters:	Parameter	Default Value	Description
	a	0	Optional; select type of memory in which you would like the terminal to calculate the number of remaining free bytes. 0 = Program memory 1 = Batch memory

Example:

Command	Operation
113\$	
B5.5	; Select buffer 5 as both source and destination buffer
G	; Clear the destination buffer
*Z	; Get the number of free bytes available in RAM
Z4.48.1	; Pad the number to 4 with leading zeros
I1.4.'1000'	; Skip 1 command if the number of free bytes is greater than 1000
L150	; Jump to control string at memory location 150

Appendix A. Memory Locations

Functional Listing of Memory Locations

Following is a functional listing of the PNC 330/340, XL, TRANZ 330, TRANZ 340, and TRANZ 380 terminal memory locations and a numeric listing for each terminal.

Note: Memory locations for the ZON 53X are the same as for the TRANZ 330; memory locations for the ZON 54X are the same as for the TRANZ 340 with the exception of location 011.

Memory locations for the PNC 330/340 operate the same as the TRANZ 330/340 with the exception of locations 950, 955, 956 and 957. See table on page A-5.

TRANZ 330/340, XL, PNC 330/340

Terminal Parameters	Memory Location	Description	Comments
	000	Download Phone No.	<i>Not available on TRANZ 340</i>
	001	Serial Number	
	004	Program Date	
	005	Transaction Sequence No.	
	006	Scroll Length Flag	
	007	Multiple Trans Timeout	
	008	Printer Type Flag	<i>TRANZ 330/340: Reserved</i>
	009	Terminal Key Beep	
	010	Dial Type Flag	
		Sequence No. Checking	<i>TRANZ 340, ZON 54X</i>
	011	Dial Speed Flag	<i>TRANZ 340: Reserved</i>
	012	Parallel Phone Avail. Flag	<i>TRANZ 340: Reserved</i>
	013	Number of Attempts	<i>TRANZ 340: Reserved</i>
	014	Telephone Line Test	<i>TRANZ 340: Reserved</i>
	015	Extended Redial Flag	<i>XL 2.80 and higher</i>
	950	Printer Type Flag	<i>TRANZ 330/340 and PNC 330/340 terminals only</i>
	951	Line Feeds for Roll Printer	<i>TRANZ 330/340 terminals only</i>
	960	Dial-up Line Up/Download Speed	<i>TRANZ 330 terminals only</i>
			<i>TRANZ 340: Reserved</i>

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	Memory Location	Description	Comments
	970	PIN Pad/Bar Code Wand Port	<i>TRANZ 330/340 terminals only</i>
	971	Extended Redial Flag	<i>TRANZ 330, version 3.40</i>
	990	Communications Error	
		Control String	<i>TRANZ 330 only</i>
	975	Line Recovery Time	<i>TRANZ 330 only</i>
	979	Abort Control String	<i>TRANZ 330/340 only</i>
Buffers	Memory Location	Description	
	002	Transmit Buffer	
	003	Receive Buffer	
Miscellaneous	Memory Location	Description	
	016	Encrypted Working Key/ Master Key Pointer	<i>TRANZ 330/340</i>
	019	Application ID	
	030	Idle Prompt	<i>See note, page 5-70, for date/time display</i>
	037	Out of Memory Control String	<i>XL only</i>
Login Strings/ Function Key Control Strings	Memory Location	Description	
	020	Login String #0	
	021	Login String #1	
	022	Login String #2	
	023	Login String #3	
	024	Login String #4	
	025	Login String #5	
	026	Login String #6	
	027	Login String #7	
	028	Login String #8	
	029	Login String #9	
	031	Function Key #1	
	032	Function Key #2	
	033	Function Key #3	
	034	Function Key #4	
	035	Function Key #5	
	036	Function Key #6	
	039	Function Key #9	

Appendix A. Memory Locations

General Records	Memory Location	
	040-099	
	113-199	
	213-299	
	313-399	
	<i>TRANZ 330/340 terminals only:</i>	
	413-499	
	513-599	
	613-699	
	713-799	
	813-899	
	913-949	
Idle Loop	Memory Location	Description
	<i>TRANZ 330/340 Terminals only:</i>	
	980 Idle Loop Control String Delay	
	981 Idle Loop Control String	
	982 Idle Loop Phone Number	
	983 Idle Loop Response Analysis Control String	
	984 Idle Loop Inactivity Timeout	
Auto Answer	Memory Location	Description
	<i>TRANZ 330 Terminals only:</i>	
	015 Delay Before Auto Answer	
	038 Auto Answer Control String	
	965 Auto Answer Speed	
	966 Auto Answer Processing	
	967 Auto Answer Packet Inactivity Timeout	

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Printer Information	Memory Location	Description
<i>TRANZ 330/340 Terminals only:</i>		
950		Printer Type Flag
951		Number of Printer 200 Line Feeds
952		Baud for Generic Roll Printer
953		Data Format for Generic Roll Printer
954		Handshake for Generic Roll Printer

Host Parameters

Parameter	Memory Location									
Transaction Key	#1	#2	#3	#4	#5	#6	#7	#8	#9	
Primary Phone Number	100	200	300	400	500	600	700	800	900	
Secondary Phone Number	101	201	301	401	501	601	701	801	901	
Call Center Phone Number	102	202	302	402	502	602	702	802	902	
Referral Phone Number	103	203	303	403	503	603	703	803	903	
Merchant/Terminal ID	104	204	304	404	504	604	704	804	904	
Message Format Flag	105	205	305	405	505	605	705	805	905	
Fraud Control Flag	106	206	306	406	506	606	706	806	906	
Transaction Control String	107	207	307	407	507	607	707	807	907	
Transaction Type Prompt	108	208	308	408	508	608	708	808	908	
Floor Limit	109	209	309	409	509	609	709	809	909	
Respsse Analysis Ctrl String	110	210	310	410	510	610	710	810	910	
Auxiliary Control String	111	211	311	411	511	611	711	811	911	
Multiple-Trans Group Code	112	212	312	412	512	612	712	812	912	

Note: Transaction Key X00-X03 are General Records on TRANZ 340.

PNC 330/340 This matrix illustrates the memory locations and required configuration for the various modes of operation of the PNC 330/340 terminal.

Table A-1. PNC 330/340 Modes of Operation

Memory Location/ Parameter	PNC Mode: Correct Value	PNC w/Printer Mode: Correct Value	TRANZ 330 Mode: Correct Value
950 Printer type flag	Memory location ignored	2 = Printer 200 3 = Printer 100/ 150 5 = Printer 250 (9600 baud)	0 = No printer (default) 1=Generic printer 2= Printer 200 3= Printer 100/ 150 4 = NCR slip printer 5 = Printer 250 (9600 baud)
955 PNC Operational Mode	955 = 0 (PNC) Default is 0	955 = 2 (PNC with Printer)	955 = 1 (TRANZ 330)
956 Baud for PNC communications with remote terminal	0 = 4800 baud (default) 1 = 1200 baud 2 = 2400 baud 3 = 4800 baud 4 = 9600 baud 5 = 19200 baud	0 = 4800 baud (default) 1 = 1200 baud 2 = 2400 baud 3 = 4800 baud 4 = 9600 baud 5 = 19200 baud	Memory location ignored
957 Character to Precede External Magnetic Stripe Reader	0 = '=' (default) 1 = '{'	0 = '=' (default) 1 = '{'	Memory location ignored

TRANZ 380

Terminal Parameters	Memory Location	Description
	0000	Download Phone Number
	0001	Serial Number
	0004	Program Date
	0005	Transaction Sequence Number
	0006	Scroll Length Flag
	0007	Multiple Transaction Timeout
	0008	Reserved
	0009	Terminal Key Beep
	0010	Dial Type Flag
	0011	Dial Speed Flag
	0012	Parallel Phone Available Flag
	0013	Number of Attempts
	0014	Telephone Line Test
	0017	RECALL, Clock, Unit/Unit Restriction
	0019	Application ID
	0030	Idle Prompt
	0950	Printer Type Flag
	0951	Printer 250 Paper Advance (Number of Line Feeds)
	0958	Bell/CCITT Mode
	0960	Dial-up Line Upload/Download Speed
	0970	PIN Pad/Bar Code Wand Port Function
	0975	Line Recovery Time
	0977	Free Memory Reclamation Parameter
	0985	Host # for Card Initiated Transactions
	0986	Host # for Bar Code Initiated Transactions
	1000	Date and Time Transfer
Buffers	Memory Location	Description
	0002	Transmit Buffer
	0003	Receive Buffer
	0018	Error Statistics Buffer
Login Strings and Function Key Control Strings	Memory Location	Description
	0020	Login String #0
	0021	Login String #1
	0022	Login String #2
	0023	Login String #3
	0024	Login String #4
	0025	Login String #5

Appendix A. Memory Locations

	Memory Location	Description
	0026	Login String #6
	0027	Login String #7
	0028	Login String #8
	0029	Login String #9
	0031	Function Key #1
	0032	Function Key #2
	0033	Function Key #3
	0034	Function Key #4
	0035	Function Key #5
	0036	Function Key #6
	0039	Function Key #9
General Records	Memory Locations	
	0016	0513-0599
	0040-0099	0613-0699
	0113-0199	0713-0799
	0213-0299	0813-0899
	0313-0399	0913-0949
	0413-0499	1050-1999
Auto Answer	Memory Location	Description
	0015	Delay Before Auto Answer
	0038	Auto Answer Control String
	0965	Auto Answer Speed
	0966	Auto Answer Processing
	0967	Auto Answer Packet Inactivity Timeout
Idle Loop	Memory Location	Description
	0980	Delay Executing Idle Loop Control String
	0981	Idle Loop Control String
	0982	Idle Loop Phone Number
	0983	Idle Loop Response Analysis Control String
	0984	Idle Loop Inactivity Timeout
Printer Information	Memory Location	Description
	0950	Printer Type Flag
	0951	Printer 250 Paper Advance
	0952	Baud for Generic Roll Printer
	0953	Data Format for Generic Roll Printer
	0954	Handshake for Generic Roll Printer

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Host Parameters	<i>Note: The following memory locations have been truncated from 4 digits to 3. Each memory location in the table below is preceded by a "0".</i>									
	Parameter Memory Location									
<i>Transaction Key</i>	#1	#2	#3	#4	#5	#6	#7	#8	#9	
Primary Phone Number	100	200	300	400	500	600	700	800	900	
Secondary Phone Number	101	201	301	401	501	601	701	801	901	
Call Center Phone Number	102	202	302	402	502	602	702	802	902	
Referral Phone Number	103	203	303	403	503	603	703	803	903	
Merchant/Terminal ID	104	204	304	404	504	604	704	804	904	
Message Format Flag	105	205	305	405	505	605	705	805	905	
Fraud Control Flag	106	206	306	406	506	606	706	806	906	
Transaction Control String	107	207	307	407	507	607	707	807	907	
Transaction Type Prompt	108	208	308	408	508	608	708	808	908	
Floor Limit	109	209	309	409	509	609	709	809	909	
Response Analysis Ctrl String	110	210	310	410	510	610	710	810	910	
Auxiliary Control String	111	211	311	411	511	611	711	811	911	
Multiple-Trans Group Code	112	212	312	412	512	612	712	812	912	
Miscellaneous	Memory Location	Description								
	0016	Encrypted Working Key/Master Key Pointer								
	0037	Out of Memory Control String								
	0979	Abort Control String								
	0990	Communication Error Control String								
	0997	VeriFone Control String								
	0999	Programming Error Recovery Log								
Reserved for Future Use	Memory Location									
	0955-0957									
	0959									
	0961-0964									
	0968-0969									
	0971-0974									
	0976									
	0978									
	0987-0989									
	0991-0996									
	0998									
	1001-1049									

**Numeric Listing of
Memory
Locations**

In addition to the memory location number and description, this numeric listing also includes the character type and the field lengths for the XL and TRANZ 330/340 memory locations.

The character type indicates which characters are permitted in these memory locations. "X" represents alphanumeric characters which include the letters A through Z, the numerals 0 through 9, and special characters *, ', " - # and (space). "9" represents the numeric characters 0 through 9.

The field length indicates the maximum number of characters that can be stored in the memory location.

XL	Memory Location	Character Type*	Field Length	Description
	000	X	20	Download Phone Number
	001	X	10	Serial Number
	002	--	--	Transmit Buffer
	003	--	--	Receive Buffer
	004	9	6	Program Date MM = month DD= date YY=year
	005	9	4	Message Sequence Number
	006	9	2	Number of Chars to Scroll
	007	9	1	Multiple-Transaction Timeout 0=multi-transaction disabled 1 = 20 seconds 2 = 40 seconds 3 = 60 seconds 4 = 80 seconds 5 = 100 seconds 6 = 120 seconds 7 = 140 seconds 8 = 160 seconds 9 = 90 minutes
	008	9	5	Printer Type 5= roll 18=slip (EPROM 2.11 & above)
	009	9	1	Beeper On/Off 0 = beep on 1 = beep off

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
010	9	2	Dial Type Flag (Tone/Pulse) 0 or <empty> = tone dial 1 = normal pulse dial (USA) 2 = 10-n dial (USA) 3 = n +1 dial (USA) (greater than 3=tone dial) 11= pulse dial (Europe) 12 =10-N (Europe) 13 = N-1 (Europe)
011	9	1	Dial Speed Flag 0 = 5 per second; very slow dial 1 = 7 per second; slow dial 2 = 10 per second; normal dial 3 = 15 per second; fast dial 4 = 20 per second; very fast dial
012	9	1	Parallel Phone Available Flag 0= phone not connected 1= phone connected
013	9	1	Number of Retries
014	9	1	Telephone Line Test Flag 0 = activate A/A1, do line test 1 = activate A/A1, don't do line test 2 = don't activate A/A1, do line test 3 = don't activate A/A1, don't do line test
015	9	3	Extended redial flag (2.80 +)
016	X	120	General Record
017	9	1	RECALL, Clock, Unit/Unit Restriction 0 = password not required
019	X	7	Application Identification
020	X	60	Login String #0
021	X	60	Login String #1
022	X	60	Login String #2
023	X	60	Login String #3
024	X	60	Login String #4
025	X	60	Login String #5
026	X	60	Login String #6
027	X	60	Login String #7
028	X	60	Login String #8
029	X	60	Login String #9
030	X	16	Idle Prompt
031	X	120	Func Key #1 Control String
032	X	120	Func Key #2 Control String
033	X	120	Func Key #3 Control String
034	X	120	Func Key #4 Control String

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
035	X	120	Func Key #5 Control String
036	X	120	Func Key #6 Control String
037	X	120	Out of Mem. Control String
038	X	120	Reserved
039	X	120	Func Key #9 Control String
040 to 099	X	120	General Records
100	X	32	Primary Phone Number
101	X	32	Secondary Phone Number
102	X	32	Call Center Phone Number
103	X	32	Referral Phone Number
104	X	46	Merchant/Terminal ID
105	9	3	Message Format Flag
106	9	3	Fraud Control Flag
107	X	120	Transaction Control String
108	X	16	Transaction Type Prompt
109	9	4	Floor Limit
110	X	120	Response Analysis Control String
111	X	120	Auxiliary Control String
112	9	1	Multi-Transaction Group Code
113 to 199	X	120	General Locations
200	X	32	Primary Phone Number
201	X	32	Secondary Phone Number
202	X	32	Call Center Phone Number
203	X	32	Referral Phone Number
204	X	46	Merchant/Terminal ID
205	9	3	Message Format Flag
206	9	3	Fraud Control Flag
207	X	120	Transaction Control String
208	X	16	Transaction Type Prompt
209	9	4	Floor Limit
210	X	120	Response Analysis Control String
211	X	120	Auxiliary Control String
212	9	1	Multi-Transaction Group Code
213 to 299	X	120	General Locations
300	X	32	Primary Phone Number
301	X	32	Secondary Phone Number
302	X	32	Call Center Phone Number
303	X	32	Referral Phone number
304	X	46	Merchant/Terminal ID
305	9	3	Message Format Flag
306	9	3	Fraud Control Flag
307	X	120	Transaction Control String
308	X	16	Transaction Type Prompt
309	9	4	Floor Limit
310	X	120	Response Analysis Control String

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
311	X	120	Auxiliary Control String
312	9	1	Multi-Transaction Group Code
313 to 399	X	120	General Locations
400	X	32	Primary Phone Number
401	X	32	Secondary Phone Number
402	X	32	Call Center Phone Number
403	X	32	Referral Phone Number
404	X	46	Merchant/Terminal ID
405	9	3	Message Format Flag
406	9	3	Fraud Control Flag
407	X	120	Transaction Control String
408	X	16	Transaction Type Prompt
409	9	4	Floor Limit
410	X	120	Response Analysis Control String
411	X	120	Auxiliary Control String
412	9	1	Multi-Transaction Group Code
413 to 499	X	120	Reserved
500	X	32	Primary Phone Number
501	X	32	Secondary Phone Number
502	X	32	Call Center Phone Number
503	X	32	Referral Phone Number
504	X	46	Merchant/Terminal ID
505	9	3	Message Format Flag
506	9	3	Fraud Control Flag
507	X	120	Transaction Control String
508	X	16	Transaction Type Prompt
509	9	4	Floor Limit
510	X	120	Response Analysis Control String
511	X	120	Auxiliary Control String
512	9	1	Multi-Transaction Group Code
513 to 599	X	120	Reserved
600	X	32	Primary Phone Number
601	X	32	Secondary Phone Number
602	X	32	Call Center Phone Number
603	X	32	Referral Phone Number
604	X	46	Merchant/Terminal ID
605	9	3	Message Format Flag
606	9	3	Fraud Control Flag
607	X	120	Transaction Control String
608	X	16	Transaction Type Prompt
609	9	4	Floor Limit
610	X	120	Response Analysis Control String
611	X	120	Auxiliary Control String
612	9	1	Multi-Transaction Group Code

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
613 to 699	X	120	Reserved
700	X	32	Primary Phone Number
701	X	32	Secondary Phone Number
702	X	32	Call Center Phone Number
703	X	32	Referral Phone Number
704	X	46	Merchant/Terminal ID
705	9	3	Message Format Flag
706	9	3	Fraud Control Flag
707	X	120	Transaction Control String
708	X	16	Transaction Type Prompt
709	9	4	Floor Limit
710	X	120	Response Analysis Control String
711	X	120	Auxiliary Control String
712	9	1	Multi-Transaction Group Code
713 to 799	X	120	Reserved
800	X	32	Primary Phone Number
801	X	32	Secondary Phone Number
802	X	32	Call Center Phone Number
803	X	32	Referral Phone Number
804	X	46	Merchant/Terminal ID
805	9	3	Message Format Flag
806	9	3	Fraud Control Flag
807	X	120	Transaction Control String
808	X	16	Transaction Type Prompt
809	9	4	Floor Limit
810	X	120	Response Analysis Control String
811	X	120	Auxiliary Control String
812	9	1	Multi-Transaction Group Code
813 to 899	X	120	Reserved
900	X	32	Primary Phone Number
901	X	32	Secondary Phone Number
902	X	32	Call Center Phone Number
903	X	32	Referral Phone Number
904	X	46	Merchant/Terminal ID
905	9	3	Message Format Flag
906	9	3	Fraud Control Flag
907	X	120	Transaction Control String
908	X	16	Transaction Type Prompt
909	9	4	Floor Limit
910	X	120	Response Analysis Control String
911	X	120	Auxiliary Control String
912	9	1	Multi-Transaction Group Code
913 to 999	X	120	Reserved

*X = alphanumeric; 9 = numeric

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TRANZ 330

Memory Location	Character Type*	Field Length	Description
000	X	20	Download Phone Number
001	X	10	Serial Number
002	--	--	Transmit Buffer
003	--	--	Receive Buffer
<i>WARNING: If you assign any value (other than <empty>) to locations 002 and 003 and attempt to perform a ZONTALK 2000 download, the download will terminate.</i>			
004	9	6	Program Date MM = month DD= date YY=year
005	9	4	Message Sequence Number
006	9	2	Number of Characters to Scroll
007	9	1	Multiple Transaction Timeout 0=multitrans disabled 1= 20 seconds 2= 40 seconds 3= 60 seconds 4= 80 seconds 5= 100 seconds 6= 120 seconds 7= 140 seconds 8= 160 seconds 9= 90 minutes
008	9	5	Reserved
009	9	1	Beeper On/Off
010	9	1	Dial Type Flag (Tone/Pulse) 0 or <empty> = tone dial 1 = normal pulse dial (USA) 2 = 10-n dial (USA) 3 = n +1 dial (USA)
011	9	1	Dial Speed Flag 0 = 5 per sec; very slow dial 1 = 7 per sec; slow dial 2= 10 per sec; normal dial 3 = 15 per sec; fast dial 4 = 20 per sec; very fast dial 9 = user-specified dial speed
012	9	1	Parallel Phone Avail. Flag 0 = phone not connected 1 = phone connected
013	9	1	Number of Retries

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
014	9	1	Line Test 0 = activate A/A1, do line test 1= activate A/A1, don't do line test 2 = don't activate A/A1, do line test 3 = don't activate A/A1, don't do line test
015	9	3	Delay Before Auto Answer
016	X	120	Encrypted Working Key Master Key Pointer
017	9	1	RECALL, Clock, Unit/Unit Restriction 0 = password not required
019	X	7	Application Identification
020	X	60	Login String #0
021	X	60	Login String #1
022	X	60	Login String #2
023	X	60	Login String #3
024	X	60	Login String #4
025	X	60	Login String #5
026	X	60	Login String #6
027	X	60	Login String #7
028	X	60	Login String #8
029	X	60	Login String #9
030	X	16	Idle Prompt
031	X	120	Func Key #1 Control String
032	X	120	Func Key #2 Control String
033	X	120	Func Key #3 Control String
034	X	120	Func Key #4 Control String
035	X	120	Func Key #5 Control String
036	X	120	Func Key #6 Control String
037	X	120	Reserved
038	X	120	Auto Answer Control String
039	X	120	Function Key #9 Control String
040 to 099	X	120	General Records
100	X	32	Primary Phone Number
101	X	32	Secondary Phone Number
102	X	32	Call Center Phone Number
103	X	32	Referral Phone Number
104	X	46	Merchant/Terminal ID
105	9	3	Message Format Flag
106	9	3	Fraud Control Flag
107	X	120	Transaction Control String
108	X	16	Transaction Type Prompt
109	9	4	Floor Limit
110	X	120	Response Analysis Control String
111	X	120	Auxiliary Control String
112	9	1	Multi-Transaction Group Code

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
113 to 199	X	120	General Locations
200	X	32	Primary Phone Number
201	X	32	Secondary Phone Number
202	X	32	Call Center Phone Number
203	X	32	Referral Phone Number
204	X	46	Merchant/Terminal ID
205	9	3	Message Format Flag
206	9	3	Fraud Control Flag
207	X	120	Transaction Control String
208	X	16	Transaction Type Prompt
209	9	4	Floor Limit
210	X	120	Response Analysis Control String
211	X	120	Auxiliary Control String
212	9	1	Multi-Transaction Group Code
213 to 299	X	120	General Locations
300	X	32	Primary Phone Number
301	X	32	Secondary Phone Number
302	X	32	Call Center Phone Number
303	X	32	Referral Phone number
304	X	46	Merchant/Terminal ID
305	9	3	Message Format Flag
306	9	3	Fraud Control Flag
307	X	120	Transaction Control String
308	X	16	Transaction Type Prompt
309	9	4	Floor Limit
310	X	120	Resp. Analysis Control String
311	X	120	Auxiliary Control String
312	9	1	Multi-Transaction Group Code
313 to 399	X	120	General Locations
400	X	32	Primary Phone Number
401	X	32	Secondary Phone Number
402	X	32	Call Center Phone Number
403	X	32	Referral Phone Number
404	X	46	Merchant/Terminal ID
405	9	3	Message Format Flag
406	9	3	Fraud Control Flag
407	X	120	Transaction Control String
408	X	16	Transaction Type Prompt
409	9	4	Floor Limit
410	X	120	Resp. Analysis Control String
411	X	120	Auxiliary Control String
412	9	1	Multi-Transaction Group Code
413 to 499	X	120	General Locations

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
500	X	32	Primary Phone Number
501	X	32	Secondary Phone Number
502	X	32	Call Center Phone Number
503	X	32	Referral Phone Number
504	X	46	Merchant/Terminal ID
505	9	3	Message Format Flag
506	9	3	Fraud Control Flag
507	X	120	Transaction Control String
508	X	16	Transaction Type Prompt
509	9	4	Floor Limit
510	X	120	Resp. Analysis Control String
511	X	120	Auxiliary Control String
512	9	1	Multi-Transaction Group Code
513 to 599	X	120	General Locations
600	X	32	Primary Phone Number
601	X	32	Secondary Phone Number
602	X	32	Call Center Phone Number
603	X	32	Referral Phone Number
604	X	46	Merchant/Terminal ID
605	9	3	Message Format Flag
606	9	3	Fraud Control Flag
607	X	120	Transaction Control String
608	X	16	Transaction Type Prompt
609	9	4	Floor Limit
610	X	120	Response Analysis Control String
611	X	120	Auxiliary Control String
612	9	1	Multi-Transaction Group Code
613 to 699	X	120	General Locations
700	X	32	Primary Phone Number
701	X	32	Secondary Phone Number
702	X	32	Call Center Phone Number
703	X	32	Referral Phone Number
704	X	46	Merchant/Terminal ID
705	9	3	Message Format Flag
706	9	3	Fraud Control Flag
707	X	120	Transaction Control String
708	X	16	Transaction Type Prompt
709	9	4	Floor Limit
710	X	120	Response Analysis Control String
711	X	120	Auxiliary Control String
712	9	1	Multi-Transaction Group Code
713 to 799	X	120	General Locations

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
800	X	32	Primary Phone Number
801	X	32	Secondary Phone Number
802	X	32	Call Center Phone Number
803	X	32	Referral Phone Number
804	X	46	Merchant/Terminal ID
805	9	3	Message Format Flag
806	9	3	Fraud Control Flag
807	X	120	Transaction Control String
808	X	16	Transaction Type Prompt
809	9	4	Floor Limit
810	X	120	Response Analysis Control String
811	X	120	Auxiliary Control String
812	9	1	Multi-Transaction Group Code
813 to 899	X	120	General Locations
900	X	32	Primary Phone Number
901	X	32	Secondary Phone Number
902	X	32	Call Center Phone Number
903	X	32	Referral Phone Number
904	X	46	Merchant/Terminal ID
905	9	3	Message Format Flag
906	9	3	Fraud Control Flag
907	X	120	Transaction Control String
908	X	16	Transaction Type Prompt
909	9	4	Floor Limit
910	X	120	Resp. Analysis Control String
911	X	120	Auxiliary Control String
912	9	1	Multi-Transaction Group Code
913 to 949	X	120	General Locations
950	9	1	Printer Type Flag 0 = no printer 1 = generic roll 2 = Printer 200/250 3 = Printer 100/150
951	9	3	No. Line Feeds for Roll Printer 6 = default
952	9	1	Baud - Generic Roll Printer 0= 300 4 = 4800 1 = 600 5 = 9600 2 = 1200 6 = 19200 3 = 2400 <empty> and out of range defaults to 300
953	9	1	Data Format for Generic Roll Printer 0= 7 data, even parity, 2 stop 1= 8 data, no parity, 2 stop

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
954	9	1	<empty> and out of range defaults to 7E2 Handshake for Generic Roll Printer 0= hardware 1 = none <empty and out of range defaults to hardware
955 to 957	X	60	Reserved
958	9	1	Bell/CCITT (CCITT units only) 0 = <empty> = BELL 1 = CCITT
959	X	60	Reserved
960	9	1	Dial-up Line Upload/Download Speed 1 = 300 baud 2 = 1200 baud (212 models only)
			CCITT Units Only:
961	X	60	Silence
962	X	60	Dial Tone
963	X	60	Busy
964	X	60	Ringback
			Other Units:
961 to 964	X	60	Reserved
965	9	1	Auto Answer Speed 1 = 300 2 = 1200 (on 212 models only)
966	9	1	Auto Answer Processing 0 = go off hook, wait 2 seconds, raise answer carrier, wait for originate carrier, wait for ENQ, execute AACS 1 = go off hook, wait 2 seconds, raise answer carrier, wait for originate carrier, execute AACS 2 = go off hook, wait 2 seconds, execute AACS
967	9	1	Auto Answer Packet Inactivity Timeout 0 or <empty> = 20 seconds inactivity 1-8 = number of 20 intervals 9 = 90 minute timeout
968 to 969	X	60	Reserved
970	9	1	DIN 6 Peripheral 0 or <empty>= nothing connected 1 = bar code wand 2 = PIN Pad 3 = general communication device

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
<i>Warning: If 2 is selected and a PIN Pad is not attached, there will be a delay when you press [CLEAR] because the terminal will still try to connect with the PIN Pad three times before resuming normal processing.</i>			
971	9	3	Extended redial flag (3.40+) If set to <empty> or 0, it will extend the normal redial feature to include up to the receipt of the ENQ. This allows the redial to occur if there is an error in the logins and if the terminal does not receive an ENQ before the timeout is expired.
972 to 974	X	60	Reserved
975	9	1	Line Recovery Time 0 or <empty>= 3 seconds
976	X	60	Moment of silence
977	9	1	Memory Manager Free Space Reclamation Parameter 0 or empty = reclaim 1 every STORE 1 = reclaim 1 every ABORT 2 = reclaim all or every ABORT > = 3 = no reclamation
979	X	120	Abort Control String
980	X	120	Delay Executing Idle Loop Control String 0 or <empty> = disabled
981	X	120	Idle Loop Control String
982	X	60	Idle Loop Phone Number
983	X	120	Idle Loop Response Analysis Control String
984	X	60	Idle Loop Inactivity Timeout
985	9	1	Host Number For Card Initiated Transaction
986	9	1	Host Number For Bar Code Initiated Transaction
987 to 989	X	60	Reserved
990	X	120	Communication Error Control String 1 = lost carrier 2 = no ENQ from host 3 = no response from host 4 = exceeded number of allowable timeouts 5 = unexpected EOT 6 = bad RX communication 7 = bad TX communication
991 to 996	X	60	Reserved
997	X	120	VeriFone Control String
998	X	60	Reserved
999	X	60	Programming Error Recovery Log

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

TRANZ 340/330 (202)

Memory Location	Character Type*	Field Length	Description
000	X	20	Reserved
001	X	10	Serial Number
002	--	--	Transmit Buffer
003	--	--	Receive Buffer
004	9	6	Program Date MM = month DD = date YY = year
005	9	4	Message Sequence Number
006	9	2	Number of Characters to Scroll
007	9	1	Multiple-Transaction Timeout 0=multitrans disabled 1 = 20 seconds 2 = 40 seconds 3 = 60 seconds 4 = 80 seconds 5 = 100 seconds 6 = 120 seconds 7 = 140 seconds 8 = 160 seconds 9 = 90 minutes
008	9	5	Reserved
009	9	1	Beeper On/Off
010	9	1	Sequence number checking 0 = check (default) 1 = do not check
011	9	1	ZON 54X only: 0 = polled terminal with LAN DISCONNECTED display (default) 1 = polled terminal w/user defined error display message (or no error message) substituting for default LAN DISCONNECTE display. (see location 012) 2 = non-polled terminal, with suppression of polled error message, allowing RS-485 communication as desired.
012	X	1	ZON 54X only: Error message to substitute for LAN DISCONNECTED display if 011 contains "1". If empty, no error message.

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
013 to 014	9	1	Reserved (ZON 54X)
011 to 014	9	1	Reserved (TRANZ 340/330(202))
015	9	3	Reserved
016	X	120	Encrypted Working Key Master Key Pointer
017	9	1	RECALL, Clock, Unit/Unit Restriction 0 = password not required
019	X	7	Application Identification
020	X	60	Poll Address
021	X	60	LAN Baud Rate (T340 only)
022 to 029	X	60	General Location
030	X	16	Idle Prompt
031	X	120	Func Key #1 Control String
032	X	120	Func Key #2 Control String
033	X	120	Func Key #3 Control String
034	X	120	Func Key #4 Control String
035	X	120	Func Key #5 Control String
036	X	120	Func Key #6 Control String
037	X	120	Reserved
038	X	120	Auto Answer Control String <i>(not available on 202 model)</i>
039	X	120	Func Key #9 Control String
040 to 099	X	120	General Records
100 to 103	X	32	General Locations
104	X	46	Merchant/Terminal ID
105	9	3	Message Format Flag
106	9	3	Fraud Control Flag
107	X	120	Transaction Control String
108	X	16	Transaction Type Prompt
109	9	4	Floor Limit
110	X	120	Resp. Analysis Control String
111	X	120	Auxiliary Control String
112	9	1	Multi-Transaction Group Code
113 to 199	X	120	General Locations
200 to 203	X	32	General Locations
204	X	46	Merchant/Terminal ID
205	9	3	Message Format Flag
206	9	3	Fraud Control Flag
207	X	120	Transaction Control String
208	X	16	Transaction Type Prompt
209	9	4	Floor Limit
210	X	120	Resp. Analysis Control String
211	X	120	Auxiliary Control String
212	9	1	Multi-Transaction Group Code

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
213 to 299	X	120	General Locations
300 to 304	X	32	General Locations
305	9	3	Message Format Flag
306	9	3	Fraud Control Flag
307	X	120	Transaction Control String
308	X	16	Transaction Type Prompt
309	9	4	Floor Limit
310	X	120	Resp. Analysis Control String
311	X	120	Auxiliary Control String
312	9	1	Multi-Transaction Group Code
313 to 399	X	120	General Locations
400 to 403	X	32	General Locations
404	X	46	Merchant/Terminal ID
405	9	3	Message Format Flag
406	9	3	Fraud Control Flag
407	X	120	Transaction Control String
408	X	16	Transaction Type Prompt
409	9	4	Floor Limit
410	X	120	Resp. Analysis Control String
411	X	120	Auxiliary Control String
412	9	1	Multi-Transaction Group Code
413 to 499	X	120	General Locations
500-503	X	32	General Locations
504	X	46	Merchant/Terminal ID
505	9	3	Message Format Flag
506	9	3	Fraud Control Flag
507	X	120	Transaction Control String
508	X	16	Transaction Type Prompt
509	9	4	Floor Limit
510	X	120	Resp. Analysis Control String
511	X	120	Auxiliary Control String
512	9	1	Multi-Trans Group Code
513 to 599	X	120	General Locations
600 to 603	X	32	General Locations
604	X	46	Merchant/Terminal ID
605	9	3	Message Format Flag
606	9	3	Fraud Control Flag
607	X	120	Transaction Control String
608	X	16	Transaction Type Prompt
609	9	4	Floor Limit
610	X	120	Resp. Analysis Control String
611	X	120	Auxiliary Control String
612	9	1	Multi-Transaction Group Code
613 to 699	X	120	General Locations
700 to 703	X	32	General Locations

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
704	X	46	Merchant/Terminal ID
705	9	3	Message Format Flag
706	9	3	Fraud Control Flag
707	X	120	Transaction Control String
708	X	16	Transaction Type Prompt
709	9	4	Floor Limit
710	X	120	Resp. Analysis Control String
711	X	120	Auxiliary Control String
712	9	1	Multi-Transaction Group Code
713 to 799	X	120	General Locations
800 to 803	X	32	General Locations
804	X	46	Merchant/Terminal ID
805	9	3	Message Format Flag
806	9	3	Fraud Control Flag
807	X	120	Transaction Control String
808	X	16	Transaction Type Prompt
809	9	4	Floor Limit
810	X	120	Resp. Analysis Control String
811	X	120	Auxiliary Control String
812	9	1	Multi-Transaction Group Code
813 to 899	X	120	General Locations
900 to 903	X	32	General Locations
904	X	46	Merchant/Terminal ID
905	9	3	Message Format Flag
906	9	3	Fraud Control Flag
907	X	120	Transaction Control String
908	X	16	Transaction Type Prompt
909	9	4	Floor Limit
910	X	120	Resp. Analysis Control String
911	X	120	Auxiliary Control String
912	9	1	Multi-Transaction Group Code
913 to 949	X	120	General Locations
950	X	60	Printer Type Flag 0 = no printer 1 = generic roll 2 = Printer 200/250 3 = Printer 100/150)
951	X	60	No. Line Feeds for Roll Printer (default=6)
952	X	60	Baud for Generic Roll Printer 0 = 300 1 = 600 2 = 1200 3 = 2400 4 = 4800 5 = 9600

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
953	X	60	6 = 19200 <empty> and out of range defaults to 300 Data Format for Generic Roll Printer 0= 7 data, even parity, 2 stop 1= 8 data, no parity, 2 stop
954	X	60	<empty> and out of range defaults to 7E2 Handshake for Generic Roll Printer 0= hardware 1= none 2= XON/XOFF <empty> and out of range defaults to hardware
955 to 969	X	60	Reserved
970	X	60	DIN 6 Peripheral 0 or <empty> = nothing connected 1 = bar code wand 2 = PIN Pad 3 = general communication device
<i>Warning: If 2 is selected and a PIN pad is not attached, there will be a delay when you press [CLEAR] because the terminal will still try to connect with the PIN pad three times before resuming normal processing.</i>			
971 to 978	X	60	Reserved
979	X	120	Abort control string
980	X	120	Delay Executing Idle Loop Control String 0 = <empty> = disabled
981	X	120	Idle Loop Control String
982	X	60	Reserved
983	X	120	Idle Loop Response Analysis Control String
984	X	60	Idle Loop Inactivity Timeout
985	9	1	Host Number For Card Initiated Transaction
986	9	1	Host Number for Bar Code Initiated Transaction
987 to 989	X	60	Reserved
990	X	120	Comm. Error Control String**
991 to 996	X	60	Reserved
997	X	120	VeriFone Control String
998	X	60	Reserved
999	X	60	Programming Error Recovery Log

***If there is a problem with the LAN status, transmitting or receiving the packet, an error flag is set and the terminal checks to see if there is a communication error control string in 990\$. The TRANZ 340 will display an error message for one second, then execute the communication error control string if it exists.*

*X = alphanumeric; 9 = numeric

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TRANZ 380	Memory Location	Character Type*	Field Length	Description
0000	X	20		Download Phone Number
0001	X	10		Serial Number
0002	—	—		Transmit Buffer
0003	—	—		Receive Buffer
0004	9	6		Program Date
0005	9	4		Message Sequence Number
0006	9	2		Number of Characters to Scroll
0007	9	1		Multiple Transaction Timeout
0008	9	5		Reserved
0009	9	1		Beeper On/Off
0010	9	1		Dial Type Flag (Tone/Pulse)
0011	9	1		Dial Speed Flag
0012	9	1		Parallel Phone Available Flag
0013	9	1		Number of Retries
0014	9	1		Line Test
0015	9	3		Delay Before Auto Answer
0016	X	18		Encrypted Working Key/ Master Key Pointer
0017	9	1		RECALL, Clock, Unit/ Unit Restriction
0018	9	16		Error Statistics
0019	X	7		Application Identification
0020	X	60		Login String #0
0021	X	60		Login String #1
0022	X	60		Login String #2
0023	X	60		Login String #3
0024	X	60		Login String #4
0025	X	60		Login String #5
0026	X	60		Login String #6
0027	X	60		Login String #7
0028	X	60		Login String #8
0029	X	60		Login String #9
0030	X	16		Idle Prompt
0031	X	120		Function Key #1 Control String
0032	X	120		Function Key #2 Control String
0033	X	120		Function Key #3 Control String
0034	X	120		Function Key #4 Control String
0035	X	120		Function Key #5 Control String
0036	X	120		Function Key #6 Control String
0037	X	120		Out of Memory Control String
0038	X	120		Auto Answer Control String
0039	X	120		Function Key #9 Control String
0040 to 0099	X	120		General Records
0100	X	32		Primary Phone Number

*X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
0101	X	32	Secondary Phone Number
0102	X	32	Call Center Phone Number
0103	X	32	Referral Phone Number
0104	X	46	Merchant/Terminal ID
0105	9	3	Message Format Flag
0106	9	3	Fraud Control Flag
0107	X	120	Transaction Control String
0108	X	16	Transaction Type Prompt
0109	9	4	Floor Limit
0110	X	120	Resp. Analysis Control String
0111	X	120	Auxiliary Control String
0112	9	1	Multi-Transaction Group Code
0113 to 0199	X	120	General Records
0200	X	32	Primary Phone Number
0201	X	32	Secondary Phone Number
0202	X	32	Call Center Phone Number
0203	X	32	Referral Phone Number
0204	X	46	Merchant/Terminal ID
0205	9	3	Message Format Flag
0206	9	3	Fraud Control Flag
0207	X	120	Transaction Control String
0208	X	16	Transaction Type Prompt
0209	9	4	Floor Limit
0210	X	120	Resp. Analysis Control String
0211	X	120	Auxiliary Control String
0212	9	1	Multi-Transaction Group Code
0213 to 0299	X	120	General Records
0300	X	32	Primary Phone Number
0301	X	32	Secondary Phone Number
0302	X	32	Call Center Phone Number
0303	X	32	Referral Phone number
0304	X	46	Merchant/Terminal ID
0305	9	3	Message Format Flag
0306	9	3	Fraud Control Flag
0307	X	120	Transaction Control String
0308	X	16	Transaction Type Prompt
0309	9	4	Floor Limit
0310	X	120	Resp. Analysis Control String
0311	X	120	Auxiliary Control String
0312	9	1	Multi-Trans Group Code
0313 to 0399	X	120	General Records
0400	X	32	Primary Phone Number
0401	X	32	Secondary Phone Number
0402	X	32	Call Center Phone Number
0403	X	32	Referral Phone Number

* X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
0404	X	46	Merchant/Terminal ID
0405	9	3	Message Format Flag
0406	9	3	Fraud Control Flag
0407	X	120	Transaction Control String
0408	X	16	Transaction Type Prompt
0409	9	4	Floor Limit
0410	X	120	Resp. Analysis Control String
0411	X	120	Auxiliary Control String
0412	9	1	Multi-Transaction Group Code
0413 to 0499	X	120	General Records
0500	X	32	Primary Phone Number
0501	X	32	Secondary Phone Number
0502	X	32	Call Center Phone Number
0503	X	32	Referral Phone Number
0504	X	46	Merchant/Terminal ID
0505	9	3	Message Format Flag
0506	9	3	Fraud Control Flag
0507	X	120	Transaction Control String
0508	X	16	Transaction Type Prompt
0509	9	4	Floor Limit
0510	X	120	Resp. Analysis Control String
0511	X	120	Auxiliary Control String
0512	9	1	Multi-Transaction Group Code
0513 to 0599	X	120	General Records
0600	X	32	Primary Phone Number
0601	X	32	Secondary Phone Number
0602	X	32	Call Center Phone Number
0603	X	32	Referral Phone Number
0604	X	46	Merchant/Terminal ID
0605	9	3	Message Format Flag
0606	9	3	Fraud Control Flag
0607	X	120	Transaction Control String
0608	X	16	Transaction Type Prompt
0609	9	4	Floor Limit
0610	X	120	Resp. Analysis Control String
0611	X	120	Auxiliary Control String
0612	9	1	Multi-Transaction Group Code
0613 to 0699	X	120	General Records
0700	X	32	Primary Phone Number
0701	X	32	Secondary Phone Number
0702	X	32	Call Center Phone Number
0703	X	32	Referral Phone Number
0704	X	46	Merchant/Terminal ID
0705	9	3	Message Format Flag
0706	9	3	Fraud Control Flag
0707	X	120	Transaction Control String

* X = alphanumeric; 9 = numeric

Appendix A. Memory Locations

Memory Location	Character Type*	Field Length	Description
0708	X	16	Transaction Type Prompt
0709	9	4	Floor Limit
0710	X	120	Resp. Analysis Control String
0711	X	120	Auxiliary Control String
0712	9	1	Multi-Transaction Group Code
0713 to 0799	X	120	General Records
0800	X	32	Primary Phone Number
0801	X	32	Secondary Phone Number
0802	X	32	Call Center Phone Number
0803	X	32	Referral Phone Number
0804	X	46	Merchant/Terminal ID
0805	9	3	Message Format Flag
0806	9	3	Fraud Control Flag
0807	X	120	Transaction Control String
0808	X	16	Transaction Type Prompt
0809	9	4	Floor Limit
0810	X	120	Resp. Analysis Control String
0811	X	120	Auxiliary Control String
0812	9	1	Multi-Transaction Group Code
0813 to 0899	X	120	General Records
0900	X	32	Primary Phone Number
0901	X	32	Secondary Phone Number
0902	X	32	Call Center Phone Number
0903	X	32	Referral Phone Number
0904	X	46	Merchant/Terminal ID
0905	9	3	Message Format Flag
0906	9	3	Fraud Control Flag
0907	X	120	Transaction Control String
0908	X	16	Transaction Type Prompt
0909	9	4	Floor Limit
0910	X	120	Resp. Analysis Control String
0911	X	120	Auxiliary Control String
0912	9	1	Multi-Transaction Group Code
0913 to 0949	X	120	General Records
0950	X	60	Printer Type Flag
0951	X	60	No. Line Feeds for Printer 250
0952	X	60	Baud for Generic Roll Printer
0953	X	60	Data Format for Generic Roll Printer
0954	X	60	Handshake for Generic Roll Printer
0955 to 0957	X	120	Reserved
0958	X	60	Bell/CCITT Mode
0959	X	60	Reserved
0960	X	60	Dial-up Line Upload/Download Speed

* X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
0961 to 0964	X	120	Reserved
0965	X	60	Auto Answer Speed
0966	9	1	Auto Answer Processing
0967	9	1	Auto Answer Packet Inactivity Timeout
0968 to 0969	X	120	Reserved
0970	X	60	DIN 6 Peripheral
0971 to 0974	X	120	Reserved
0975	X	60	Line Recovery Time
0976	X	60	Reserved
0977	9	1	Free Memory Reclamation
0978	X	60	Reserved
0979	X	60	Abort Control String
0980	X	120	Delay Executing Idle Loop Control String
0981	X	120	Idle Loop Control String
0982	X	60	Idle Loop Phone Number
0983	X	120	Idle Loop Response Analysis Control String
0984	X	60	Idle Loop Inactivity Timeout
0985	9	1	Host No. for Card Initiated Transaction
0986	9	1	Host Number for Bar Code Initiated Transaction
0987 to 0989	X	120	Reserved
0990	X	120	Comm. Error Control String
0991 to 0996	X	120	Reserved
0997	X	120	VeriFone Control String
0998	X	120	Reserved
0999	X	60	Programming Error Recovery Log
1000	X	120	Date and Time Transfer
1001 to 1049	X	120	Reserved
1050 to 1999	X	120	General Records

* X = alphanumeric; 9 = numeric

Appendix B. Communications

Dial Strings

One of the subprocesses of communications is dialing. The terminal requires a dial string to specify the phone number to dial and how to dial out. There are a variety of instructions that can be used in the dial string and a variety of ways in which the dial string can be constructed, dependent on the terminal type, the environment in which the terminal is placed, the telephone line, the network and the host. A dial string may be as long as 20 characters. Characters which are not commands will be dialed even though they may not be needed to access a particular modem.

Usually TCL terminals attempt to dial the primary phone number stored in memory location X00 (X = key pressed 1 through 9). In some custom applications however, the terminal may be instructed to dial a phone number in a different location by using the S.m command (note that the "m" parameter is specified). In both cases, the specified phone number is only a portion of the dial string. Other parts of the dial string are modem commands and protocol commands.

Dial Parameters

Following is a list of categorized dial string parameters.

P = fast connect

Note: Currently the P "fast connect" parameter is only available in TRANZ 330 3.60 and above. Fast connect does not follow the Bell standard.

The P parameter causes the terminal to perform fast connect as soon as a transaction is initiated (key press or card swipe). The P must be in the first position of the dial string to perform forced pre-dial and fast connect. For fast connect only, the P can be located elsewhere in the dial string, dependent on specified requirements. Only 1200 baud fast connections can be supported. An "N" for 1200 baud must be included in the dial string to ensure the terminal is operating at 1200 baud.

S1 and S2 are supported, however the terminal will not pre-dial more than once (i.e. it will not redial the predial).

As soon as the terminal has dialed the last digit of the dial string, it transmits a tone and starts looking for a carrier from the answering modem. Carrier validation is slightly faster than that of a normal modem connection. Once the carrier has been detected and validated, the terminal waits for an <ENQ>.

R = Pre-dial

The terminal begins dialing as soon as a key is pressed or a card is swiped. R must be the first character of the dial string. Normal Bell standard connect protocol is followed.

Characters to Dial Once Phone Is Off Hook

Digits or characters (two characters maximum) which the terminal will dial once the phone is off hook (xx).

Pauses and Delays	<p>D = Delay Wait for dial tone, then dial next digit or character. Hang up if dial tone is not available or if the timeout period has elapsed. (Default timeout period is 30 seconds).</p> <p>- = Pause One or two second delay prior to the terminal continuing with dialing any additional digits.</p> <p>W = Delay until Dial Tone Wait for a dial tone or "blind dial" if a dial tone has not been detected within two seconds.</p>
Phone Number	Phone number to dial.
Login Type	<p>X = soft login requested Attempts to log in to a network where the login protocol is written in software. Refer to Appendix I "Writing Soft Logins" for further detail.</p> <p>L = hard login requested Attempts to login in to the network specified.</p> <p><i>Note: Hard logins are not supported in TRANZ 330 3.60.</i></p>
Memory Location Specifier	This points to the rightmost digit of the memory location (020 through 029) containing network login data. This follows the login request type in the dial string.
Check for Busy Tone	<p>B instructs the terminal to check for a busy tone. If a busy tone is detected, the terminal will display BUSY, hang up and redial the phone number. There is a 5 second line recovery time from the time the terminal hangs up before it will dial again. Memory location 013 (Number of Retries) controls how many times the terminal will redial.</p> <p>If there is no "B" in the dial string, the terminal waits the entire carrier detect timeout (30 second default) before hanging up. Memory location 013 (Number of Retries) controls how many times the terminal will redial.</p>
Baud Rate	<p>M = 300 baud N = 1200 baud</p>
Samples of Dial Strings	<ol style="list-style-type: none">1. Fast Connect, Forced Predial at 1200 baud: Dial string = P9D5555555N P = Dial parameter - Forced predial and Fast connect 9 = Digit or character to dial to exit PBX D = Wait for dial tone 5555555 = Phone Number N = Baud Rate, 1200 baud2. Fast Connect at 1200 baud: Dial string = 9D5555555NP

9 = Digit or character to dial to exit PBX
D = Wait for dial tone
5555555 = phone number
N = Baud Rate, 1200 baud
P = Dial parameter - Fast connect

3. Forced Predial at 1200 baud

Dial string = R9-5555555N
R = Dial parameter - Forced predial
9 = Digit or character to dial to exit PBX
- = pause
5555555 = phone number
N = Baud Rate, 1200 baud

4. Softcoded Login at 300 baud

Dial string = 9W5555555X0M
9 = Digit or character to dial to exit PBX
W = wait for dial tone or two seconds
5555555 = phone number
X = Login type. Initiate softcoded login
0 = location 020 is where softcoded login data is stored
M = Baud rate, 300 baud

Protocols

TCL terminals use two default communication protocols which are commonly referred to by the financial industry as VISA first generation and VISA second generation protocol. Although the communication dialogue for both protocols is identical, the transmit and receive packet formats are very different. This appendix outlines the communication dialogue common to both protocols, and shows the transmit and receive packet formats for the first generation protocol.

Note: Because the transmit and receive packet formats used by the VISA second generation protocol are proprietary to VISA, they are not included in this appendix. Information about the second generation protocol is available from VISA upon request.

Character Definitions

As you review the diagrams of the communication dialogues and the packet formats, you will see various abbreviations and special characters. Following is a list of these abbreviations and their meanings.

Abbrev.	Hex Value	Description
STX	02	Start of Text
ETX	03	End of Text
EOT	04	End of Transmission
ENQ	05	Enquiry
ACK	06	Acknowledge
NAK	15h	Negative Acknowledge
FS	1Ch	Field Separator
WCC		Write Control Character (see text)
LRC		Longitudinal Redundancy Check (see text)

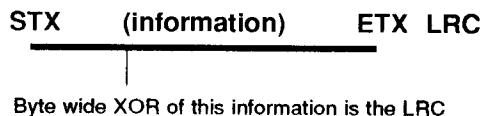
Write Control Character

WCC is the write control character which may have the following values:

- @ single transaction; account data entered via keypad
- A single transaction; account data entered via cardreader
- B multiple transaction; account data entered via keypad
- C multiple transaction; account data entered via cardreader

Longitudinal Redundancy Check

LCR is the EXCLUSIVE -OR of each byte starting after the STX and ending with ETX.

**Communication Dialogue Without Error**

Following is an outline of an error-free communication dialogue. This dialogue is used by both the first and second generation protocols.

Terminal	Host
1. Calls Host	→
2.	← Answers Phone, Sends ENQ
3. Send Transmit Packet	→
4.	← Send ACK (optional)
5.	← Send Response Packet
6. Send ACK	→
7.	← Send EOT
8. Hangup	Hangup

**Terminal Does Not Send
the Transmit Packet**

Following is an outline of a communication dialogue where the host answers the phone, but the terminal does not send the transmit packet. This dialogue represents an error situation and is used by both first and second generation protocols.

Terminal	Host
1. Calls Host	————→
2.	← Answers Phone Sends ENQ, wait 3 - 5 seconds
3.	← Sends ENQ, wait 3 - 5 seconds
4.	← Sends ENQ, wait 3 - 5 seconds
5.	← Hangup

**Dialogue Where the Host
NAKS the Transmit
Packet**

This dialogue represents an error situation where the host NAKS the transmit packet. It is used by both first and second generation protocols.

Terminal	Host
1. Calls Host	————→
2.	← Answers Phone, Sends ENQ
3. Send Transmit Packet	————→
4.	← Send NAK
5. Send Transmit Packet	————→

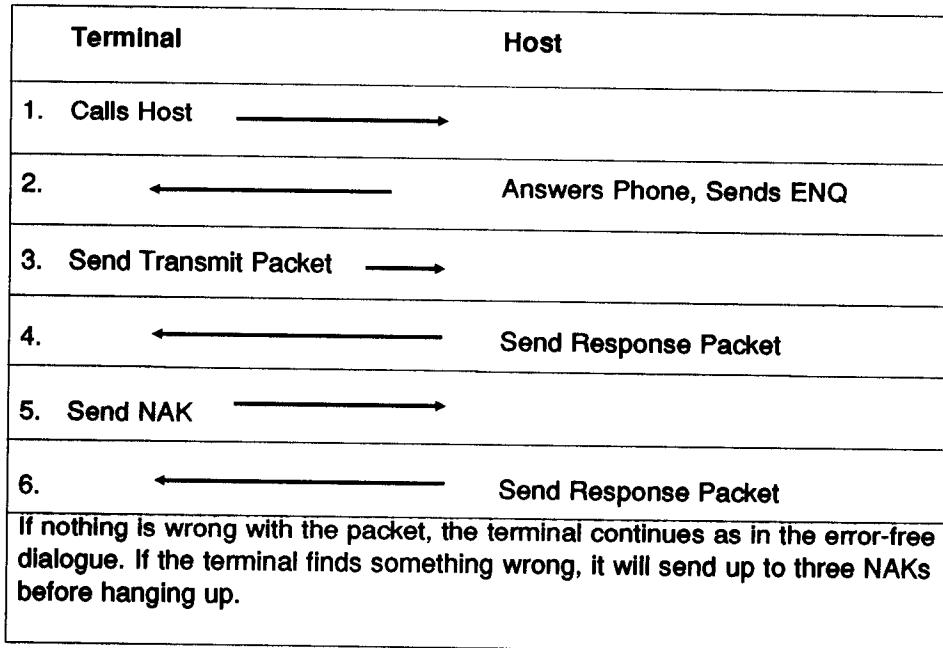
If the host does not find anything wrong with the packet, the host continues as in the error-free communications dialogue.

If the host finds something wrong, it sends a NAK again.

The terminal will send the transmit packet a maximum of three times and then hangup.

Dialogue Where the Terminal NAKS the Response Packet

The following dialogue represents an error situation where the terminal NAKS the response packet received from the host.



First Generation Credit Authorization Packet Formats

Following is the standard transmit packet format for a first generation credit authorization. The bold face identifies data automatically added by the terminal.

Format:

STX <merchant ID> FS WCC <account number> FS
<expiration date> FS <amount> ETX LRC

Receive Packet Format

Following is the standard receive packet format for a first generation credit authorization.

Format:

STX <response message>ETX LRC

Network Logins

The process of communication between the terminal and the desired host may include the use of a Network Login Dialogue. The advantage of communicating through a network is to reduce costs of long distance telephone charges; however, transaction processing time will increase because the terminal must go through the network login procedure before the network makes the connection between the terminal and host.

Communication Messages

The communication process consists of three sub-processes: Dialing, Network Login, and Host/Terminal Communication. Messages displayed on your terminal during each of these stages follow.

Appendix B. Communications

Note: TRANZ 380 corresponding memory locations have 4-digits (020=0020, 029=0029, etc.).

Dialing Messages	Message	Explanation
	NO TEL NUM	No data has been stored in the primary phone number location (x00) for this host transaction.
	WAITING FOR LINE	The terminal's line sense circuitry has determined that the telephone line is currently in use.
	DIALING	The terminal is dialing the primary host telephone number for this transaction.
	NO LOGIN SPEC	The host phone number contains an "L" with no login string number after it.
	BAD LOGIN SPEC	The login specifier stored in the terminal's login string (XL/TRANZ locations 020-029) is invalid ('0' <= specifier <= '8').
	BAD LOGIN STRING	The login string stored in the terminal (XL/TRANZ locations 020-029) is invalid (no network specifier, username, password, or not enough separators).
	WAITING FOR ANSR	The terminal dialed the host telephone number and is waiting for the host carrier tone.
	NO ANSWER	The terminal did not detect the host carrier tone within the Carrier Detect Timeout Period. This may be the result of the call not being answered by the host, a busy signal, or the host answering but hanging up before raising its carrier tone.
	DIALING 2ND NUM	The terminal did not receive the carrier tone from the primary host and is attempting to call the secondary host telephone number.
	CONNECTED	The host has answered the call and raised its carrier; the terminal has responded by raising its carrier tone.
Network Login Messages	Message	Explanation
	LOGGING IN	The terminal has completed dialing the network's telephone number and is beginning the login protocol specific to the network being used.

	Message	Explanation
	NO @ FROM HOST	Telenet. The terminal has not received the required "@" character within the time specified for this network.
	NO (CR) FRM HOST	Tymnet. The terminal has not received the required carriage return character within the time specified for this network.
	NO (=) FROM HOST	GEISCO. The terminal has not received the required "=" character within the time specified for this network. NO LOGIN MSG
	NO USER NAME	The terminal did not receive the network's identification message within the time specified for the selected network.
	NO PASSWORD	The selected network requires a user name from the terminal but none has been stored in the unit's login string (location 020-029).
Host/Terminal Communications Messages	Message	Explanation
	NO ENQ FROM HOST	The terminal has received the host carrier tone, but it did not receive the required ENQ within the specified ENQ timeout period.
	TRANSMITTING	The host has sent the required ENQ and the terminal is sending its transmit packet.
	RECEIVING	The terminal has completed sending the transmit packet and is now waiting for the response packet from the host.
	NO RESP FRM HOST	The terminal has not received any response from the host within the specified timeout period. The host neither ACKed or NAKed the transmit packet.
	BAD TX COMMUN	The host has sent multiple NAKs indicating that it has not correctly received the terminal's transmit packet and has reached the limit on the number of times it can resend the transmit packet.
	BAD RX COMMUN	The terminal incorrectly received the host response packet multiple times and has reached the limit on the number of NAKS it can send.

Appendix B. Communications

Message	Explanation
HOST DISCONNECT	The terminal received an EOT without receiving a response packet.
LOST COMM W/HOST	The host has dropped its carrier signal. This could indicate that the host hung up or that the phone line is dead.

Appendix C. TCL Code for Commonly Used Functions

Account Ranging for the XL

This routine compares the first four digits of the entered card number with each low and high range in the Account Range Table to ensure the card number is valid. When the entered card number falls within the range, the host number, card type, floor limit, data capture flag, additional field flag, and valid descriptor codes are put into a designated location for later processing. This routine uses the following setup:

- The source code is stored in memory locations 222, 223, 224, 225 and 226,
- Buffers 4 and 5 alternate as the source and destination buffers,
- Memory locations 214 through 218 are used for temporary storage:
 214 low value of range
 215 high value of range
 216 memory location of account range entry being searched
 217 card number (first 4 digits)
 218 self-modified control strings
- Memory location 221 reserved for host number, card type, floor limit, etc.; set to 0 at beginning of routine; if range not found, remains 0,
- Location 199 holds the "CARD NOT RANGED" message,
- Location 231 holds input data; WCC TRANCODE FS ACC.DATA FS AMT.

Note: After executing this routine you should execute the "Transfer" routine to move the host information into the appropriate memory locations.

Account Ranging Control String	Command	Comments
	221=0	
	222\$; Begin account ranging—get card number, ; then initialize flags and pointers.
	B.4	; Select buffer 4 as the destination buffer
	G	; Clear it
	A231	; Append input data from location 231 to ; buffer 4
	B4.5	; Select buffer 4 as source buffer, and ; buffer 5 as the destination buffer
	G	; Clear buffer 5

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Command	Comments
H	; Move the extraction pointer to the 1st FS in ; the transmit buffer
O	; Move extraction pointer one more position ; so it points to the first digit of the card number
X4	; Copy first 4 digits of account number to buffer 5
U217	; Copy 4 digits of account number to location 217
G	; Clear destination buffer
R'43'	; Append '43' (location of 1st account range ; entry) to buffer 5
U216	; Copy account range entry to location 216
G	; Clear buffer 5
R48	; Append 0 (range not found) to buffer 5
U221	; Store buffer 5 contents in location 221
L223	; Continue with the control string stored at ; location 223
223\$; Build control string to get low and high ; ranges from the Account Range Table into ; temporary locations.
G	; Clear buffer 5
R'B.4GA'	; Append literal control string to buffer
A216	; Append Account Range Table to buffer
5R'B4.5GX4U214GX4U215*M'	
U218	; Store built control string in location 218
*L218	; Execute the control string in location 218
L224	; Continue with the control string stored ; at location 224
218\$; Control string built by \$223
B.4	; Select buffer 4 as destination buffer
G	; Clear it
Ann	; Append contents of nn ;(nn = 43,44,45,46,47, the current table entry)
B.4.5	; Select buffer 4 as source and buffer 5 as ; the destination buffer
G	; Clear buffer 5
X4 ;	; Copy low range from source to dest. buffer
U214 ;	; Store in location 214
G	; Clear buffer 5
X4 ;	; Copy high range from source to dest. buffer
U215 ;	; Store in location 215
*M	; Return to calling control string, ; Location 223
224\$; Compares the low and high values with the ; entered account number.
B5.5	; Select buffer 5 as both the source and ; destination buffer
G	; Clear it
A217	; Append first 4 digits of card number
T214.1	; (low range - card number) store at ; location 214

Appendix C. TCL Code for Commonly Used Functions

Command	Comments
T215.1	; (high range - card number) store at ; location 215
G	; Clear buffer 5
A214	; Append (low range - card number)
I4.4.48	; if (low-card#) > 0, the card is not in ; range skip 4 commands
G	; Clear buffer 5
A215	; Append (high-card number)
I1.3.48	; If (high-card number) < 0, the card is not in ; range skip 1 command
L225	; If card number found within range, execute ; the control string at location 225
L226	; If card number is not found within range, ; execute the control string at location 226
225\$; Card number found within range table ; get host number, card type, floor limit, etc. ; stored in location 221
B.5	; Select buffer 5 as the destination buffer
G	; Clear it
R'B.4GA'	; Append literal
A216	; Append Account Range Table entry pointer
R'B4.5G08XU221*M'	
U218	; Store built control string in location 218
*L218	; Execute the control string in location 218
*M	; Return
226\$; Card number not found within range get next ; Account Range Table entry and test again
B5.5	; Select buffer 5 as both the source and ; destination buffer
G	; Clear buffer 5
A216	; Append the account range table pointer
I2.3.'48'	; If range table pointer is less than 48, ; skip 2 commands
P199	; Display "CARD NOT RANGED"
*K1	; and abort; leave display up
G	; Clear buffer 5
R49	; Append '1'
T216	; Increment account range table pointer to ; next location
L223	; Link back to the control string at location ; 223 to compare to next range

Adding Records to the Data Capture File

After you create a data capture record in the destination buffer, you can add it to the data capture file using this code. After the terminal adds the record to the end of the data capture file, it will check to see if there is enough memory available to add records.

TCL Programmer's Manual

Command	Comments
*C	; Add record to batch with contents built in ; current destination buffer
*F2.1	; If not out of memory, skip 2 else ; skip 2 commands
P73	; Display "OUT OF MEMORY"
K1	; Abort and leave the current display

Copying Data From One Memory Location to Another

This subroutine causes the terminal to copy data from one memory location to another, with the terminal prompting you to enter the memory locations to copy from and to. This subroutine uses the following setup:

- The source code is stored in locations 31 and 131,
- Buffer 5 is the destination buffer,
- Location 214 = location to copy from,
- Location 215 = location to copy to,
- Locations 216 and 217= self-generated code,
- Location 298 = "COPY TO LOC?" prompt,
- Location 299 = "COPY FROM LOC?" prompt

Note: TRANZ 380 corresponding memory locations have 4 digits (214 = 0214, 299 = 0219, etc.).

Copy Memory Location Control String

Command	Comments
31\$; Get the location numbers
B.5	; Select buffer 5 as destination buffer
G	; Clear it
P299	; Display "COPY FROM LOC?"
K2.3	; Accept 3 digits from keypad
D1	; Delete the field separator
U214.5	; Copy data from buffer 5 to location 214
G	; Clear buffer 5
P298	; Display "COPY TO LOC?"
K2.3	; Accept 3 digits from keypad
D1	; Delete field separator
U215.5	; Copy data from buffer 5 to location 215
G	; Build self-generating code
R'A'	; Clear buffer 5
A214	; Put an "A" in the buffer
U216.5	; Append data from location 214 to buffer
G	; Store self-generated code in location 216
L131	; Clear the buffer
131\$; Link to location 131
R'U'	; Put a "U" in the buffer
A215	; Append data from location 215 to buffer

Appendix C. TCL Code for Commonly Used Functions

Command	Comments
R'.5' U217.5 G *L216 *L217	; Put ".5" in the buffer—Uxxx.5 ; Store self-generated code in location 217 ; Clear the buffer ; Execute the control string at location 216 ; Execute the control string at location 217
Match Entered Number to Data Capture Record Number	This routine uses a 4-digit number, entered by the user, to retrieve a data capture record. If the terminal cannot find a matching record, it displays the message "NOT FOUND" and aborts the operations. The control string for this routine is divided into three modules and uses the following setup: <ul style="list-style-type: none"> • The source code is stored in locations 031, 159, 160 and 161, • Buffer 3 is the source buffer, • Buffer 5 is the destination buffer, • Memory location 214 is a temporary storage area for the 4-digit number, • Location 215 is a temporary storage area for the self-generated code.
Command	Comments
031\$ *L159 B3.5 G *E1 *F2.3 F70 *K1 *L160 *L161	; Get item number and set up batch ; Did the entered item number equal 0? ; Select buffer 3 as the source buffer, and ; Buffer 5 as the destination buffer ; Clear buffer 5 ; Get the first data capture record ; If no record exists, display ; "NO TRANSACTIONS" ; and abort the operation ; Set variable for match routine ; Execute control string at location 160 to ; build self-generating code ; Execute control string at location 161- match ; routine ; When the routine returns to this point, the ; matching data capture record has been ; found and is in buffer 5. ; Module 1 159\$ B3.3 G F38 K2.3
	; Get the 4-digit number of the record to be ; reviewed ; Select buffer 3 for both the source and ; destination buffer ; Clear buffer 3 ; Display "ENTER ITEM #" prompt

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Command	Comments
I3.2.28	; If entered character is not a FS, skip 3 ; commands
R49	; If character entered character is a FS ; default to record #1
I1	
D	; otherwise, delete the FS
Z3.48.1	; Pad to 3 characters with zeros, right
	; justify
U214.3	; Copy buffer 3 to location 214
	; Set up the batch
*B	; Select the current batch
*F2.2	; If no batch, display
F70	; "NO TRANSACTIONS"
*K1	; and abort the operation
	; Module 2
160\$; This subroutine builds the self-generating ; code that compares the item numbers and ; retrieves data capture records until the ; item numbers match. This subroutine uses ; variable #5 as a found/not found flag ; (0=not found, 1=found) and assumes ; the entered item number is in location 214.
*N#5.48	; Build self-generating code ; Set found flag to "not found," ; 48 = ASCII 0
B.3	; Select buffer 3 as destination buffer
G	; Clear it
R'I1.2.'	
R39	
A214	
R39	
R'*N#5.49*M'	
U215.3	
	; Module 3
161\$; This match routine is executed after the ; first data capture ; record is in buffer number 5.
B5.3	; Select buffer 5 as source buffer and buffer ; 3 as the destination buffer
G	; Clear buffer 3
X3	; Get item number from the data capture ; record in buffer 5, and copy it ; to buffer 3
B3.3	; Select buffer 3 as both source and ; destination buffer

Appendix C. TCL Code for Commonly Used Functions

Command	Comments
*L215	; Execute control string at location 215 ; (code to compare item numbers)
G	
R48	
I1.1.#5	; If #5 = 0 (record not found), ; skip 1 command; if #5 = 1 ; (record found)
*M	; Exit subroutine
B.5	; Records did not match—select buffer 5 ; as the destination buffer
G	; Clear it
*E0	; Copy the next data capture record to buffer 5
*F2.3	; If no more records, display
F71	; "NOT FOUND"
*K1	; and abort
L161	; Loop to the beginning of this string

Performing a Memory Dump

Using the "Y" command you can cause the terminal to cycle through all of its memory locations and print the contents of each non-blank memory location. This type of procedure is commonly referred to as a memory dump and may be performed using the following control string.

Command	Comments
G	; Clear the destination buffer
Y2	; Append a memory location—when no ; Memory locations are left, ; Skip 2 commands
N	; Print the destination buffer
I-3	; Loop back 3 commands (back to "G")

Removing Characters

Using the "H" and "X" commands, you can find specific data and copy it from the source buffer to the destination buffer. You can also use the "H" command to find characters you do not want to copy. After moving the extraction pointer past the characters you do not want copied, you can again use the "X" command to copy the rest of the source buffer.

The following example is a subroutine that will cause the terminal to copy the source buffer to the destination buffer, removing the first decimal point encountered.

Command	Comments
X.46	; Copy up to a decimal point
H2.46	; Find a decimal point—if the decimal point ; is not found, skip 2 commands
O	; Increment the extraction pointer by 1 to ; skip the decimal point
X	; Copy the rest of the source buffer

Testing Printer Handshake Lines

The following test checks the printer being powered up by verifying the hand-shake lines on the serial port. This test is especially useful for checking for the existence of a printer.

Command	Comments
B1.1	; Select transmit buffer as source and ; destination
G	; Clear it out
R17	; Append XON character to transmit buffer
*R5.2.1	; Set serial port to 9600 baud, ; no handshaking, 7E1
*I0	; Send the transmit buffer (XON)
*W1	; Allow 1 second for printer to respond
+R6.2	; If CTS is now active, ; skip 2 (printer on line)
Pxxxx	; Display "PRINTER DOWN" or another message
I-8	; Repeat loop

Appendix D. TCL Communication Routines

Direct I/O on TRANZ 330/380 to Transmit a Batch

The following example supports direct Input/Output, specifically on TRANZ 330/380 terminals, and is not for use when a login string appended to the phone number is used. The routine supports 1200 baud—but will work with 300 baud with only a few modifications—and reads and transmits a batch record. After all records have been transmitted, a completion message is sent and communication is finished.

Requirements

TRANZ 330 version 2.0 and greater. TRANZ 380—all versions.

***WARNING:** If a login string is needed to connect to a host, you must fall out of memory location X07/0x07, then link memory location X10/0x10 to a memory location and take over communication from that point.*

The following are things in this routine that can be changed:

- The location of the prompts and all control strings
- Memory location 907/0x07
- Buffers 3 & 4
- All packet formats (160\$, 161\$, 162\$)
- The termination character (ex. 'RS', *P command)
- If used with 300 baud, change '*P....2' to '*P....1'

Variables Used	Purpose	Control String Used In
#9	Set the connect timeout	920\$, 921\$
#8	Set the retry count	921\$, 922\$
#1	Set the retry count	925\$, 927\$

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Locations Used*	Purpose	Locations Called From
054	Used as a block counter	
160	Builds logon packet	907\$
161	Reads batch and builds packet	907\$
162	Sends completion	161\$
298	Used as a flag for end of batch	
900	Host phone number	
904	Merchant ID	
907	Begin the transaction	
920	Connect to host	907\$
921	920 continued	
922	Wait for ENQ	921\$ cont.
925	Sets the retry count	907\$
926	Transmits the packet	925 cont. 927\$
927	Analyze response	926 cont.
930	Display error message and quit	922\$
931	Display error message and quit	926\$, 927\$
942 - 949	Prompts	

The following is the code for this routine:

```
900=9-18003334444L9 ; Host phone number
904=TESTMID           ; Merchant ID
942=DIALING
943=CONNECTED
944=TRANSMITTING
946=NO CONNECTION
947=WAITING FOR ANSR
948=NO ENQ FR HOST
949=LOST COMM W/HOST
907$                  ; Batch close
S                      ; Start dialing
*L160                 ; Build logon packet
*L920                 ; Connect and login
*L161                 ; Build batch record packet
*L925                 ; Send packet
*L910                 ; Process response
I-3                   ; Repeat
910$                  ; If completion hasn't been sent, continue
A298.7                ; Set termination char. to ACK
*P6
```

*These locations are preceded by "0" for the TRANZ 380.

Appendix D. TCL Communication Routines

Locations Used*	Purpose
U299.2	; Store response
B2	; Reset buffer
I1.1.4	; If an EOT is sent, quit
I2	; Else continue
F14	; Display "BATCH CLEARED"
*K1	; Quit
 920\$	
	; Communication - dialing and connecting
	; Set up carrier timeout
P942	; Display "DIALING"
*N#9.20000	; Connect timeout: 20,000 cycles = 45 seconds
B.2	; Select receive buffer
G	; Clear it
*V	; Check the phone status
B2	; Select source buffer
I-3.2.56	; If <> 8 (WAITING FOR ANSWER), go back
*P....2	; Reset modem chip, and set for 1200 baud
*W1	; Delay after reset before checking carrier
P947	; Display "WAITING FOR ANSR"
L921	; Continue
 921\$	
	; Connect: begin checking for carrier present
+K7.4	; Check for carrier
B	; ** need a command that makes the terminal ; scan the keyboard **
I-2.7.#9	; No carrier detected - check for 45 seconds
P946	; Display "NO CONNECTION"
*K1	; Die
+K0	; Turn originate carrier on
*N#8.3	; Set retry count to 3
L922	; Continue
 922\$	
	; Connected: wait for ENQ from host
P943	; Display "CONNECTED"
B2.2	; Reset buffer
G	; Clear it
+I7.15.1	; Wait for input on modem port for 15 seconds ; or skip 1
L930	; Timed out, die
B2	; Reset extraction pointer
H1.5	; Search for ENQ

*These locations are preceded by "0" for the TRANZ 380.

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Locations Used*	Purpose
I1	; Found it, skip 2
I-6.7.#8	; Try 3 times to get ENQ
P944	; Display "TRANSMITTING"
L925	; Send packet
925\$	
	; File transfer - transmit packet
*N#1.3	; Set number of retries
L926	
926\$	
	; Transmit packet - continued from 925\$
+K7.1	; Check for carrier on every pass
L931	; Lost carrier, go display and quit
B1.1	; Reset buffers
+I1	; Send packet with ETX/LRC
B2.2	; Select receive buffer
G	; Clear it
+I6.10.1	; Get one packet or one character
L931	; Display "NO RESP" and quit
L927	; Got something! go check it
927\$	
	; See what is in the receive buffer
B9	; Reset pointer in receive buffer
I1.2.4	; Check for EOT
L928	; EOT received, transfer done
B9	; Reset pointer
I5.1.6	; Check for ACK
B1.1	; Select transmit buffer
D2	; Delete last ETX/LRC before re-transmit
I1.7.#1	; If retry count = 0
L931	; Display "NO RESP"
L926	; Not ACK, re-transmit up to 3 times
*M	; Packet acknowledged
930\$	
	;Timed out or no enq
P948	; Display "NO ENQ FRM HOST"
*G1	; Error beep
*K1	; Quit
931\$	
	;Lost communication with host
P949	; Display "LOST COMM"
*G1	; Error beep
*K1	; Quit

*These locations are preceded by "0" for the TRANZ 380.

Building Packets	Locations Used*	Purpose
160\$		
B.1		; Append the logon header to the transmit buffer
G		
U298		; Clear completion flag
R49		
U54		; Start block counter at 1
G		; Clear transmit buffer
R2		; Append a STX
A54		; Append block ID '1'
R		; Append a FS
R49		; Append message type '1'
R		; Append a FS
A904		; Append merchant ID
R		; Append FS
*B		; Select the Batch
*P.6		; Set response character to an ACK
161\$; Read batch and send it
B.3		; Select work buffer
G		; Clear it
R49		; Add one to
T54		; block ID counter
G		; Clear buffer
*E		; Copy batch record to dest.buffer (buffer 3)
*F7		; Skip 7 if end of batch
B3.1		; Source = Work , Destination = Transmit
G		; Clear transmit
R2		; Append STX
A54		; Append block ID
R		; Append FS
X		; Copy batch record
I1		; Skip 1
L162		; Send completion
162\$; Build a message completion packet
B1.1		; Select transmit buffer
G		; Clear it
*P30.4..1		; Set termination character to EOT
R30		; Append RS - this means hang-up
U298		; Save it
;end		

*These locations are preceded by "0" for the TRANZ 380.

Direct I/O on TRANZ for Dial-up Communication

Requirements

This module allows the TRANZ 330/380 terminal to use dial-up communication on the terminal's local function keys. This module allows the terminal to transmit and receive data packets using VISA first generation protocol.

To be used on the TRANZ 330 terminal, EPROM 2.0 or above and TRANZ 380. Use this module in conjunction with TCOMDLUP.001. It dials and connects with the host.

***WARNING:** This module is designed to work on the local function keys.
These memory locations will be called from 031-039.*

***Note:** The memory location of the phone number used to dial can be
changed in this routine.*

Variables	Purpose	Control String Used In
#0	Determines the # of retries	383, 385
Locations Used	Purpose	Locations Called From
383	Receive communication driver Sets retry limit	384
384	Transfers packet to the host	383, 385
385	Receives data from host	384
386	Display "NO RESP FR HOST"	384, 385
388	Display "LOST COMM W/HOST"	384
389	Send ACK to host	385
773	Transmitting prompt	384
474	Receiving prompt	385
475	No response from host prompt	386
476	No ENQ from host prompt	387
477	Lost communication with host	388

The following is the code for this routine:

```
383$      ; Set retry limit
*N#0.3    ; Set retry limit to 3
*L384     ; Transmit packet

384$      ; File transfer - transmitting
P473      ; Display, "TRANSMITTING"
B1.1
+I1       ; Send packet
+K7.1     ; If still connected, skip one
L388      ; else, display, "LOST COMM W/HOST"
B2.2
G
+I7.100.1 ; Wait for one character or packet
L386      ; Else, "NO RESP FR HOST"
```

Appendix D. TCL Communication Routines

Locations Used	Purpose
H2.5 G I-4 L385	; If "ENQ" found ; clear buffer ; Continue waiting for packet ; Else, wait for response and send ACK
385\$ P474 B H2.2 *L389 *M B I4.2.6 +I7.100.1 L386 *L389 *M B I2.2.4 *L389 *M B1.1 D2 I1.7.#0 L386 L384	; Display, "RECEIVING" ; If packet present ; send ACK ; Return and process response ; if ACK received ; wait for packet ; Go to "No Response" ; Send ACK ; and process packet ; Check for EOT ; Send ACK ; EOT received, transfer done ; Else, ; Delete previous ETX/LRC ; Decrement variable ; Link "NO RESP" ; Not ACK, re-transmit up to 3 times
	; The following is a subroutine that displays "NO RESP FROM HOST" ; on the TRANZ terminal:
386\$ P475 *K1	; Reserved for "NO RESP FROM HOST" ; Display, "NO RESP FROM HOST" ; Abort and leave display
	; The following is a subroutine that displays "LOST COMM W/HOST" ; on the TRANZ terminal:
388\$ P477 *K1	; Reserved for "LOST COMM W/HOST" ; Display, "LOST COMM W/HOST" ; and abort leaving display
	; The following is a subroutine that sends an ACK to the host after receiving ; the response packet:
389\$ B1.1 G	; send ACK

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Locations Used	Purpose
R6 +I	; Append ACK
	; Associated Special Prompts
	473=TRANSMITTING
	474=RECEIVING
	475=NO RESP FR HOST
	476=NO ENQ FROM HOST
	477=LOST COMM W/HOST

Appendix E. TCLOAD Basics

TCLOAD

TCLOAD is an easy-to-operate software development tool designed to run on the IBM-PC, -XT, -AT and compatibles having at least 256K of RAM. TCLOAD requires:

- an IBM-compatible serial port to transfer its output to the target XL/TRANZ terminal; COM PORT 1 is the standard default serial port, however it is possible to select COM PORT 2.
- The direct download cable available from VeriFone, part numbers are:

XL, PNC 330/340, TRANZ 330/340 to IBM PC: part number 00446-05

XL, PNC 330/340, TRANZ 330/340 to IBM AT: part number 00446-04

Note: TRANZ 380 download protocol does not support the memory image download format used with other VeriFone terminals. See Section 4. TRANZ 380 Packet Formats in the TCLOAD Reference Manual, part number 10016, for further information on TRANZ 380 downloads and other information you will need to operate this development tool.

Installing TCLOAD

General-purpose support for all versions of TCL firmware is done through a data file that is external to the .EXE file. This .DBS file is maintained and updated whenever a new firmware release occurs. Contact your VeriFone sales representative should you require an update of the TCLOAD database.

You may install your database file, TCLOAD.DBS, in any of the following locations:

- The directory you are currently working in
- A directory specified by an environment variable TCLPATH

For example, if you added the following line to your AUTOEXEC.BAT file:

```
set TCLPATH=C:\TCLOAD\DBMS
```

TCLOAD would try to find the file:

```
C:\TCLOAD\DBMS\TCLOAD.DBS
```

- Any directory in your search path (environment variable "PATH")

You can still override all of the above locations using the -b command line option, as explained later; however, you will have to supply the complete path and file name.

Writing a TCL File

You can write the TCL file using any PC word processor capable of producing an ASCII text file. (WordStar and Microsoft Word are among the more popular word processor programs.) When writing the TCL file, use the word processor's non-document mode and include TCLOAD file directives. TCLOAD file directives control the processing of the TCL commands while running the TCLOAD program.

TCLOAD File Directives

Terminal Operating System Version Number

File directives allow you to link files, define data storage locations, set the EPROM operating system version number, initialize command strings and document each TCL command. The following section describes each file directive option.

When creating a terminal image file for direct download, or when building the .DXL/DTZ file, TCLOAD verifies the version of the operating system resident in the target XL or TRANZ terminal. Therefore, you must identify the EPROM version in your TCL file using the version directive: a percent (%) sign followed by the EPROM version number. (This version directive must be the first non-comment line in the file and must begin in column 1.)

If an incorrect EPROM version is entered, the system will revert to the default XL or TRANZ version and prompt you to "CONTINUE? [Y/N].

The EPROM operating system software version is displayed when the terminal is first powered up. Use this number with the directive "%".

The following example shows how to set the EPROM version for various signon messages:

Signon Message	Use
XL 2.11	%2.11
XL XE2BU2.51	%XE2BU251
TZ 330 3E2AU2.10	%3E2AU210

If the terminal is not available, call your VeriFone sales representative to get the proper version ID for your terminal.

Note: The value of the operating system is irrelevant if you are building a .UDL file.

Include File Directive

TCLOAD supports modularity by allowing you to create separate TCL files for various terminal functions. For example, you could create one TCL file for transaction keys and another for the VOID function. You could then use the include file directive @ ("at" sign) to link all of the TCL files during a TCLOAD execution. The "@" directive begins in column one and is followed by the file path name.

For example, to direct TCLOAD to include the Root file found in your source directory, type:

@C:\SOURCE\ROOT.EXT<CR>LF>

Note: TCLOAD permits the nesting of include files; the maximum permissible level depends on your system configuration. Please refer to your DOS system manual for details.

VeriFone recommends that for large applications, you create separate TCL files for each function. You can then create an include file, containing the operating system software version and the path names for each of the TCL function files. The following example shows an include file which links two TCL files:

```
%1.71  
@C:\BATCH.INC  
@C:\DATA.INC
```

Comment Directive	TCLOAD allows you to document your application code by including comments after TCL commands. You can write comments anywhere in the TCL file using the semi-colon (;) comment directive. When writing comments, begin them with a semi-colon and terminate the comment with a carriage return and line feed. The following example shows various uses of the comment directive: %3E2CU300 ; this is version 3.00 of the OPSYS @C:\BATCH.INC ; include the batch settlement file ; A comment directive can also begin in column one.
Data Declaration Directive	The data declaration directive, the equal (=) sign, assigns a string of data to a memory location. The data directive must exist on one and only one line; it cannot be split across a line. The directive is terminated by either the carriage return or comment directive (";" sign). When using the data declaration directive, write the three-digit memory location address beginning in column one, and use the following format: NNN=STRING<CRLF> NNNN=STRING<CRLF> (TRANZ 380) Where: NNN = 3-digit memory location address NNNN = the 4-digit memory location address (TRANZ 380) STRING = the data string The following example shows a prompt assignment to memory location 123: 123=ENTER DATE
Command String Declaration Directive	The command string declaration directive, the dollar (\$) sign, assigns a TCL control string to a memory location. When using the control string declaration directive, write the three-digit memory location address beginning in column one, and use the following format: NNN\$STRING nnnn\$string (TRANZ 380) Where: NNN = 3-digit memory location address NNNN = 4-digit memory location address (TRANZ 380) STRING = the TCL control string

Note: You can enter any number of spaces, comments or TCL commands following the \$ directive. To terminate a command string directive, either write another file directive or end the file.

In the following example, a control string is assigned to memory locations 131 and 143, and then the file ends:

```
131$  
    G ; Clear buffer  
    A50 ; Get first prompt  
    V.2.4; Put it up and wait  
  
143$  
    GA29; Clear and append buffer  
    . . .
```

Partial Download Directive

A partial download is a download in which only selected memory locations are downloaded to an XL or TRANZ 330/340/380 terminal. This type of download is ideal for updating control strings without downloading the entire program. You can select memory locations for partial download using the ampersand (&) partial download directive.

When marking memory locations for partial download, remember to place the "&" directive in column one and to use the following format:

**&NNN\$STRING
&NNNN\$STRING**

Where:

NNN= 3-digit memory location;
NNNN = 4-digit memory location (TRANZ 380)
STRING = the TCL control string

or

**&NNN=STRING<CR><LF>
&NNNN=STRING<CR><LF> (TRANZ 380)**

Where:

NNN =3-digit memory location
NNNN = 4-digit memory location (TRANZ 380)
STRING = the string of data

This partial download directive only affects the UDL file. The following example marks the control string for a partial download stored in memory location 131.

```
&131$  
    G ; Clear buffer  
    A50 ; Get first prompt  
    V.2.4; Display it and wait
```

Note: You can also use the ZONTALK 2000 "Mark Entry" feature to mark memory locations for a partial download. Consult the ZONTALK 2000 Reference Manual for more information on marking memory locations for a partial download.

Running the TCLOAD Program

Now that you've written your TCL files using the TCL commands and the TCLOAD file directives, you're ready to run the TCLOAD Program. At the system prompt, type:

TCLOAD filename.ext -option 1 option 2 ...

Where:

TCLOAD = the program command name

filename.ext = the name of your application program file

option = one of the TCLOAD options

TCLOAD Options

- D** This option is used to create a ZONTALK DXL/DTZ file; the file is used to perform a ZONTALK direct download (not supported by TRANZ 380).
- Tn** This option is used to direct download to a target XL or TRANZ terminal via COM port n, where n = 1 (COM 1) or 2 (COM 2).
- U** This option creates a ZONTALK UDL file; the file is used by ZONTALK to perform downloads via a modem.
- A** This option can only be used with the "U" option to mark all memory locations in the UDL file for a partial download. Default is not marking for a partial download.

B<filename>

This option is used to specify the file name of the firmware description database file. This is the file that keeps track of the different EPROM releases and some basic things that are supported in them.

V<ver>

This option is used to change the version ID from the command line by adding the phrase "-v<vers>" to the command line, where <vers> = the version ID you want.

- Z** This option requires the name of a valid Device Driver file to follow the command option. It may be used as with a TCL program or in a stand-alone fashion. When used alone, it must be accompanied by the -V option to provide an EPROM ID (not supported by TRANZ 380).
- R** Create .RCL file for RAM cartridge downloads. This option must be used with a TCL text file in order to generate an .RCL file

Note: Option commands are not case sensitive. Separate each option command with one or more spaces. Options may be combined and will be interpreted from left to right. [CTRL] [C] will abort the download process.

To view a short description of the TCLOAD options, just type "TCLOAD" without any arguments.

Error Handling

TCLOAD error reports include a three-digit error code number as well as the description of the error. When you report any problems you are having with TCLOAD, be sure to include both the code number and description.

Error messages consist of four parts:

- Level or severity
- 3-digit error code
- Description
- Location of error

There are four levels of severity included in error messages:

- INFORMATIONAL - not pertinent to the correctness of a program
- WARNING - there is potentially erroneous code
- SEVERE - the program is not correct
- FATAL - TCLOAD could not recover from the error

The text of an error description is usually sufficient to direct you to the nature of the problem and how to correct it. The error description enclosed in double quotes may contain a portion of your program that is part of the error.

The location of the error is given by file name and line number, unless the error does not have anything to do with your TCL program itself.

Note: If an error description begins with the words "INTERNAL CONFUSION", report the error immediately to VeriFone Customer Support (1-800-654-1674). This message indicates you have triggered an unexpected weakness in TCLOAD, aside from any possible "bug" in your program. Do not attempt to find the source of the problem. Prepare a complete copy of the program and command line that triggered this error message after calling Customer Support and send it to VeriFone so that the problem can be corrected as soon as possible.

The following is a numerical listing of error codes along with definitions and an explanation of the procedure to use for correcting the error.

Appendix E. TCLOAD Basics

Code	Severity	Description	Corrective Action
002	FATAL	RAM heap space exhausted, while trying to allocate	TCLOAD requires 256K of available memory. There is either insufficient RAM on your PC or too much of your RAM is already occupied with other memory-resident software.
003	FATAL	Could not find firmware description database file	If there is a file name given, it is the file you named on DOS command line with the -b command option. If there is no file name given, the file TCLOAD.DBS could not be found in any of the customary places. Consult the Installation Procedure section in the <i>TCLOAD Reference Manual</i> .
004	FATAL	Not a TCL firmware description database	The file TCLOAD expected to be its firmware description database is incorrect. Obtain and install a proper copy of this file.
005	FATAL	Incompatible firmware description database, version	The database file is obsolete (incompatible with a new version of TCLOAD.EXE). Obtain and install the version of TCLOAD.DBS that should have accompanied your firmware.
006	WARNING	Missing description in database of firmware version	The database file does not contain data on the new TCL EPROM release that you are developing. Obtain the version of TCLOAD.DBS that should have accompanied your firmware and install it.
008	SEVERE	Name of database file not supplied, using default	You used the -b command option from the DOS command line, but gave no file name. TCLOAD is telling you that it will search for the file TCLOAD.DBS in the customary places
009	FATAL	Version directive must be first uncommented line	You have something other than comments before your version (%) directive.
010	SEVERE	Version ID not supplied, using ID in program text	You used the -v command option from the DOS command line but gave no version ID name. TCLOAD is telling you that it will use the version directive present in your TCL program.
011	WARNING	Version already identified	There is more than one version directive present in your TCL program. Only the first version is recognized.
012	WARNING	Line truncated at 80 characters, location	There is a line of text in your program that is longer than the maximum permitted. Break it up into lines that fit on your PC screen.

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Code	Severity	Description	Corrective Action
063	SEVERE	Location cannot be stored	The indicated memory location has already been defined.
067	SEVERE	Too many characters in location	The length of the string in this location exceeds the maximum supported by the TCL EPROM.
078	SEVERE	INTERNAL CONFUSION expected character	The indicated character is normally not encountered. Report this error to VeriFone Customer Support immediately.
086	FATAL	Unsupported communications port #	Only ports 1 and 2 are supported.
087	SEVERE	Unable to configure COM port	The specified COM port could not be initialized for XL direct download.
088	SEVERE	Serial port configuration error	The serial port could not be initialized for XL direct download.
089	SEVERE	Serial output buffer overflow	A character could not be output because the serial output buffer was saturated.
090	WARNING	Terminal reporting invalid memory map	A terminal is indicating that you are attempting to download an incompatible memory image.
091	SEVERE	Direct download transmission error	The memory image could not be transferred to the terminal.
092	FATAL	Mismatch in EPROM version numbers	A TRANZ terminal is indicating an incompatible memory image.
093	SEVERE	Command option specified in supported card type	Only Track 1 and Track 2 cards are currently supported.

For further information regarding TCLOAD, refer to the *TCLOAD Reference Manual* (VeriFone Part Number 10016).

Appendix F. Fixed Prompts Tables

This appendix includes the listing of the fixed prompts stored in ROM and controlled by the "F" command. Both a numerical and alphabetical listing of the prompts are provided.

Numerical List

**Fixed Prompts Table
1 through 32**

Code	Fixed Prompt
1	ENTER ACCOUNT #
2	EXPIRY DATE MMYY (month, year)
3	AMOUNT OF SALE
4	ENTER TRAN CODE
5	ENTER ID NUMBER
6	ENTER CARD
7	TCK ID # OR CARD
8	ENTER STATE CODE
9	BIRTHDATE MMDDYY (month, day, year)
10	ENTER DATE MMYY (month, year)
11	AMOUNT OF CREDIT
12	BAD TRAN CODE
13	BALANCED OK
14	BATCH CLEARED
15	BATCH IS FULL
16	BATCH PURGED
17	BATCH RETAINED
18	CANNOT CORRECT
19	CAPTURE COMPLETE
20	CARD EXPIRED
21	CONFIRM 0=Y 1=N
22	CONT. BATCH? Y/N
23	DELETE BATCH ?
24	DEP? PRESS ENTER
25	DEPOSIT AMT NEXT
26	DISP=0 PRINT=1
27	END OF BATCH
28	END OF REPORT
29	ENTER # TICKETS
30	ENTER AMOUNT
31	ENTER AUTH CODE
32	ENTER CARD TYPE

Fixed Prompts 33 through 80	Code	Fixed Prompt
	33	ENTER CODE
	34	ENTER COMPANY #
	35	ENTER DEPOSIT
	36	ENTER DESC CODE
	37	ENTER EXP DATE
	38	ENTER ITEM #
	39	ENTER NEW AMOUNT
	40	ENTER NEW NUMBER
	41	ENTER NEW# AGAIN
	42	ENTER OLD AMOUNT
	43	ENTER OLD NUMBER
	44	ENTER ORIG AUTH#
	45	ENTER ORIG CODE
	46	ENTER ORIG SEQ #
	47	ENTER PASSWORD
	48	ENTER PLAN #
	49	ENTER REF NUMBER
	50	ENTER SECOND KEY
	51	ENTER STORE #
	52	ENTER SUPER #
	53	ENTER TERM ID
	54	ENTER TRAN TYPE
	55	ENTR DATE MMDDYY
	56	ENTR OFFLINE CDE
	57	FIELD NUMBER
	58	IN BALANCE
	59	INVALID PASSWORD
	60	INVALID RESPONSE
	61	INVALID SUPER #
	62	ITEM COUNT:
	63	KEY NOT OPEN
	64	LOCAL REVIEW
	65	MANAGEMENT
	66	MUST CHECK TOTS
	67	MUST DO STARTUP
	68	NEW BATCH BEGINS
	69	NEW NUMBER READY
	70	NO TRANSACTIONS
	71	NOT FOUND
	72	PLEASE WAIT ...
	73	PRINTING ...
	74	PROCESSING ...
	75	PROTECTION INVLD
	76	RE-TRANSMIT
	77	REENTER EXP DATE
	78	SERV NOT ALLOWED
	79	SETTLE NOW
	80	SETTLE SOON

Appendix F. Fixed Prompts Tables

Fixed Prompts 81 through 126	Code	Fixed Prompt
	81	SUPER # CHANGED
	82	SUPER # DELETED
	83	THANK YOU
	84	TICKET ACCEPTED
	85	TOTAL AMOUNT
	86	TOTAL LEVEL
	87	TRAN COUNT:
	88	TRANSMIT BATCH ?
	89	UNSUCCFL TRNSMIT
	90	VOID
	91	VOID-PRESS ENTER
	92	BANK NUMBER
	93	SERIAL NUMBER
	94	DRIVERS LICENSE
	95 - 99	Not used
<i>Note: Fixed prompts 100 through 124 are not available in the PNC 330 and PNC 340.</i>		
	100	SALES DRAFT
	101	CREDIT VOUCHER
	102	CASH ADVANCE OR DISBURSEMENT
	103	DATE CLERK
	104	TIME LIC#/STATE OR ID#
	105	QUAN DESCRIPTION AMT
	106	
	107	TRANSFER FROM (TO) SUBTOTAL _____
	108	CHECKING IF DEBIT TAX _____
	109	CARD USED TIP/MISC _____
	110	TOTAL
	111	ACCOUNT # EXP
	112	MERCHANT
	113	SIGNATURE
	114	X _____
	115	NOT REQUIRED - AUTH ONLY
	116	I AGREE TO PAY ABOVE TOTAL AMOUNT
	117	ACCORDING TO CARD ISSUER AGREEMENT
	118	(MERCHANT AGREEMENT IF CREDIT VOUCHER)
	119	RETAIN THIS COPY FOR YOUR RECORDS
	120	TOP COPY-MERCHANT BOTTOM COPY-CUSTOMER
	121	BALANCING REPORT
	122	DATE TIME
	123	TERMINAL TOTAL
	124	# AMT
	125	INSERT FORM ...
	126	... PRESS ENTER

Alphabetical List

Fixed Prompt	Code	
#	AMT	124
(MERCHANT AGREEMENT IF CREDIT VOUCHER)	118	
...PRESS ENTER	126	
ACCORDING TO CARD ISSUER AGREEMENT	117	
ACCOUNT #	EXP	111
AMOUNT OF CREDIT	11	
AMOUNT OF SALE	3	
BAD TRAN CODE	12	
BALANCED OK	13	
BALANCING REPORT	121	
BANK NUMBER	92	
BATCH CLEARED	14	
BATCH IS FULL	15	
BATCH PURGED	16	
BATCH RETAINED	17	
BIRTHDATE MMDDYY (month, day, year)	9	
CANNOT CORRECT	18	
CAPTURE COMPLETE	19	
CARD EXPIRED	20	
CARD USED	TIP/MISC_____	109
CASH ADVANCE OR DISBURSEMENT	102	
CHECKING IF DEBIT TAX_____	108	
CONFIRM 0=Y 1=N	21	
CONT.BATCH? Y/N	22	
CREDIT VOUCHER	101	
DATE	CLERK	103
DATE	TIME	122
DELETE BATCH?	23	
DEP? PRESS ENTER	24	
DEPOSIT AMT NEXT	25	
DISP=0 PRINT=1	26	
DRIVERS LICENSE	94	

Appendix F. Fixed Prompts Tables

Fixed Prompt	Code
END OF BATCH	27
END OF REPORT	28
ENTER # TICKETS	29
ENTER ACCOUNT #	1
ENTER AMOUNT	30
ENTER AUTH CODE	31
ENTER CARD	6
ENTER CARD TYPE	32
ENTER CODE	33
ENTER COMPANY #	34
ENTER DATE MMYY (month, year)	2
ENTER DEPOSIT	35
ENTER DESC CODE	36
ENTER EXP DATE	37
ENTER ID NUMBER	5
ENTER ITEM #	38
ENTER NEW AMOUNT	39
ENTER NEW NUMBER	40
ENTER NEW# AGAIN	41
ENTER OLD AMOUNT	42
ENTER OLD NUMBER	43
ENTER ORIG AUTH #	44
ENTER ORIG CODE	45
ENTER ORIG SEQ #	46
ENTER PASSWORD	47
ENTER PLAN #	48
ENTER REF NUMBER	49
ENTER SECOND KEY	50
ENTER STATE CODE	8
ENTER STORE #	51
ENTER SUPER #	52
ENTER TERM ID	53
ENTER TRAN CODE	4
ENTER TRAN TYPE	54
ENTR DATE MMDDYY	55
ENTR OFFLINE CDE	56
EXPIRY DATE MMYY (month, year)	2

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Fixed Prompt	Code
FIELD NUMBER	57
I AGREE TO PAY ABOVE TOTAL AMOUNT	116
IN BALANCE	58
INSERT FORM...	125
INVALID PASSWORD	59
INVALID RESPONSE	60
INVALID SUPER #	61
ITEM COUNT:	62
KEY NOT OPEN	63
LOCAL REVIEW	64
MANAGEMENT	65
MERCHANT	112
MUST CHECK TOTS	66
MUST DO STARTUP	67
NEW BATCH BEGINS	68
NEW NUMBER READY	69
NO TRANSACTIONS	70
NOT FOUND	71
NOT REQUIRED - AUTH ONLY	115
Not used	95-99
PLEASE WAIT...	72
PRINTING...	73
PROCESSING...	74
PROTECTION INVLD	75
QUAN DESCRIPTION AMT	105
RE-TRANSMIT	76
REENTER EXP DATE	77
RETAIN THIS COPY FOR YOUR RECORDS	119

Appendix F. Fixed Prompts Tables

Fixed Prompt	Code
SALES DRAFT	100
SERIAL NUMBER	93
SERV NOT ALLOWED	78
SETTLE NOW	79
SETTLE SOON	80
SIGNATURE	113
SUPER # CHANGED	81
SUPER # DELETED	82
TCK ID # OR CARD	7
TERMINALTOTAL	123
THANK YOU	83
TICKET ACCEPTED	84
TIME LIC#/STATE OR ID#	104
TOP COPY-MERCHANT BOTTOM COPY-CUSTOMER	120
TOTAL	110
TOTAL AMOUNT	85
TOTAL LEVEL	86
TRAN COUNT:	87
TRANSFERFROM(TO) SUBTOTAL_____	107
TRANSMIT BATCH ?	88
UNSUCCFL TRANSMIT	89
VOID	90
VOID-PRESS ENTER	91
X_____	114
_____	106

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Appendix G. ASCII Table

Decimal Value	Hexadecimal Value	ASCII Character	XL/TRANZ Display
0	00	NUL	^@
1	01	SOH	^A
2	02	STX	^B
3	03	ETX	^C
4	04	EOT	^D
5	05	ENQ	^E
6	06	ACK	^F
7	07	BEL	^G
8	08	BS	^H
9	09	HT	^I
10	0A	LF	^J
11	0B	VT	^K
12	0C	FF	^L
13	0D	CR	^M
14	0E	SO	^N
15	0F	SI	^O
16	10	DLE	^P
17	11	DC1	^Q
18	12	DC2	^R
19	13	DC3	^S
20	14	DC4	^T
21	15	NAK	^U
22	16	SYN	^V
23	17	ETB	^W
24	18	CAN	^X
25	19	EM	^Y
26	1A	SUB	CLR SCRN
27	1B	ESC	^[
28	1C	FS	^\\
29	1D	GS	^]

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Decimal Value	Hexadecimal Value	ASCII Character	XL/TRANZ Display
30	1E	RS	^A
31	1F	US	^_
32	20	SPC	
33	21	!	n/d
34	22	"	n/d
35	23	#	#
36	24	\$	\$
37	25	%	n/d
38	26	&	n/d
39	27	,	,
40	28	(<
41	29)	>
42	2A	*	*
43	2B	+	+
44	2C	,	,
45	2D	-	-
46	2E	.	.
47	2F	/	/
48	30	0	0
49	31	1	1
50	32	2	2
51	33	3	3
52	34	4	4
53	35	5	5
54	36	6	6
55	37	7	7
56	38	8	8
57	39	9	9
58	3A	:	=
59	3B	;	n/d
60	3C	<	<
61	3D	=	=
62	3E	>	>
63	3F	?	?
64	40	@	@
65	41	A	A

Appendix G: ASCII Table

Decimal Value	Hexadecimal Value	ASCII Character	XL/TRANZ Display
66	42	B	B
67	43	C	C
68	44	D	D
69	45	E	E
70	46	F	F
71	47	G	G
72	48	H	H
73	49	I	I
74	4A	J	J
75	4B	K	K
76	4C	L	L
77	4D	M	M
78	4E	N	N
79	4F	O	O
80	50	P	P
81	51	Q	Q
82	52	R	R
83	53	S	S
84	54	T	T
85	55	U	U
86	56	V	V
87	57	W	W
88	58	X	X
89	59	Y	Y
90	5A	Z	Z
91	5B	[[
92	5C	\	\
93	5D]]
94	5E	^	^
95	5F	-	-
96	60	'	@
97	61	a	A
98	62	b	B
99	63	c	C
100	64	d	D
101	65	e	E

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Decimal Value	Hexadecimal Value	ASCII Character	XL/TRANZ Display
102	66	f	F
103	67	g	G
104	68	h	H
105	69	i	I
106	6A	j	J
107	6B	k	K
108	6C	l	L
109	6D	m	M
110	6E	n	N
111	6F	o	O
112	70	p	P
113	71	q	Q
114	72	r	R
115	73	s	S
116	74	t	T
117	75	u	U
118	76	v	V
119	77	w	W
120	78	x	X
121	79	y	Y
122	7A	z	Z
123	7B	{	[
124	7C		\
125	7D	}]
126	7E	~	^
127	7F	DEL	=

Appendix H. EPROM Naming Conventions

All VeriFone products containing EPROMs adhere to the standards listed in the *EPROM Naming Convention* Document, part number 10243. These standards were created to prevent software integrity problems. The following constraints are adhered to when naming EPROMs:

- The name must not be greater than 8 characters and cannot contain any special characters because it will be a legal DOS file name.
- The number must uniquely identify a release and indicate it is an alpha/beta or production release, and it must distinguish between successive releases.
- The number should be consistent across a terminal's family of products.

Each software release number consists of a fixed 8-digit name preceded by "S" (indicating software) and a unique 3-digit number assigned by document control. A typical release number looks like: S194-XC2BU22B.

The characters in the 8-digit name represent the following:

Character	Element	Definition
-----------	---------	------------

1	p	Product Identifier
2	i	Customer/Country/Language Identifier
3	r	Magnetic Card reader Type
4	m	Modem Type
5	t	Telephone System Compatibility/Timing
6	v	Sequential Release Number
7	v	Sequential Release Number
8	a	Release Audience Identifier

This extract from document number 10243 lists naming conventions for the EPROMs in XL and TRANZ terminals following the EPROM structure pirmtvva. Element types are labeled "AN" for alphanumeric, "A" for alphabetic, and "N" for numeric.

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Element	Type	Description
p	1AN	Product Identifier
Range:	2	TRANZ 240
	3	TRANZ 330
	4	TRANZ 340
	5	ZON 530
	6	ZON 540
	7	PNC 330
	8	PNC 340
	9	TRANZ 380
	A	TRANZ 290/TRANZIT 1200C (128K RAM)
	C	TRANZ 330 SDLC Citinet
	D	DataCard 360
	E	TRANZIT 1200C (extended memory)
	L	XL 300
	M	TRANZ 420, hardware rev C
	P	ZON Jr PLUS
	R	TRANZ 410/420
	T	TRANZIT 1200C (32K RAM)
	U	TRANZ 380 w/calculator keyboard
	V	TXO based platforms
	X	XL
	Y	TRANZ 330 64K
	Z	ZAPD firmware
<hr/>		
I	1A	Customer/Country/Language Identifier
Range:	A	English (with DES encryption)
	B	Bancomer
	C	Columbia
	D	BUYPASS downloading
	E	English
	F	EFS (Jr +)
	G	German (prompts)
	H	French (prompts)
	I	Israel (Shavit Telecom)
	J	Dutch (prompts)
	K	Icelandic (prompts)
	L	Finland (special PTT requirements and prompts)
	M	Multi-Service
	N	Cayman National Bank (CNB)
	O	Holland (prompts)
	P	Belgian (Flemish prompts)
	Q	India (special PTT requirements)
	R	Ireland (special Telco features)
	S	Spanish

Appendix H. EPROM Naming Conventions

Element	Type	Description
I range (continued)		
T		Italy (prompts)
U		U.K. (special PTT requirements)
V		Spanish (with DES encryption)
W		Sweden (prompts and PTT requirements)
X		USPS custom EPROM (protocol and communication)
Y		CULLUM custom EPROM enhancements
Z		Mexico (PTT and 15-digit support for amount.)

If "Y" of element "I" is in position 5:

A	South Africa (English prompts)
B	Thailand
C	Denmark2 w/alternate Danish prompts
D	Denmark w/Danish prompts
E	Sharp ECR interface
F	French prompts w/French Telco Sys.
G	German prompts and telephone protocol
H	Belgian with French prompts
I	Generic International
J	Belgian with Dutch prompts
K	UK, Barclays with English prompts
L	Finnish EPROM w/Swedish prompts
M	Morocco with French prompts
N	NCR Canada DATPAC 3201 English
P	Barcode *Y to *U error passing
R	Portugal with Portuguese prompts
S	Spanish prompts with Spain Telco Sys.
T	Turkey with Turkish prompts
U	Austria with German prompts
V	Venezuela with Spanish prompts

If "V" of element "I" is in position 5:

E	Discover voice (USA telco system)
R	RS232 leased line terminal
V	ValuCard EPROMs (USA telco system)
F	TRANZ 330 fast connect

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Element	Type	Description
r	1AN	Magnetic Cardreader Type
Range:	1	Track 1 (code 39 bar code)
	2	Track 2 (code 39 bar code)
	3	Track 2 (UPC-A bar code)
	4	Track 1 (UPC-A bar code)
	9	N/A (no mag cardreader capability)
	5	Track 1 (I 2 of 5 Bar Code Telec.)
	6	Track 2 (I 2 of 5 Bar Code Telec.)
	8	Track 2 (I 2 of 5 Bar Code - Standard)
	A	Dual track and code 39 Bar Code
	B	Dual track and UPC-A Bar Code
	C	Dual track and I 2 of 5 Bar Code
	D	Dual track and no Bar Code
m	1A	Modem Type
Range:	A	300 Baud, Bell 103
	B	300 Baud, CCITT V.21
	C	1200 Baud, Bell 212A (Fairchild)
	D	Bell 103/212a & CCITT V.21/V.22 (SST K-222 modem)
	E	Bell 103/212a Only (SST K-222 modem)
	F	RS485 LAN, 19.2K Baud
	G	CCITT V.21/V.22 only (SSI K-322 modem)
	H	Bell 202 (4-wire leased-line)
	K	Bell 103/212a & CCITT V.21/V.22 (Rockwell 2424)
	L	Bell 103/212a only (Rockwell 2424)
	M	CCITT V.23 modem
t	1A	Telephone System Compatibility/Timing
Range:	A	Australia
	B	Burroughs Poll Select Leased-line protocol
	C	Czechoslovakia
	D	Datapac 3201 leased line protocol
	E	Greece
	F	Finland
	G	Great Britain (UK)
	H	Hong Kong
	I	Austria
	J	Reserved for future use
	K	Denmark
	L	Standard Leased line protocol
	M	Tinet Cluster Leased-line
	N	VeriFone LAN (T340, T240)

Appendix H. EPROM Naming Conventions

Element	Type	Description
t range (continued)		
O		Norway
P		Philippines
Q		Reserved for future use
R		PSTN Indonesia
S		Singapore
T		Portugal
U		USA
V		Refer to position 2 for country customer code
W		Switzerland
X		Reserved for future use
Y		Refer to position 2 for country customer code
Z		New Zealand
a Range:	1AN A - Z	Release Audience Identifier Alpha character (increments for each internal release made);
	Ø - 9	Numeric character indicating current production release

- Examples** An XL v.21 Track 2 EPROM with Columbian prompts is named "XC2BU22B". The parameters indicate it is the second alpha/beta release of the twenty-second software release for this product.
- A TRANZ 330 Bell 103 EPROM for Latin America is named "3S1AU030". The parameters indicate it is the first production version of the third software release for this product.
- A TRANZiT 1200C multi-telco EPROM is name "TE9DU100". The parameters indicate it is the first production version of the first software release for this product.

Appendix I. Writing Soft Logins

Overview The purpose of a generic login is to have one routine at the operating system level that will be a login string interpreter capable of handling all logins. Logins function the same to:

- Transmit information
- Receive information
- Wait for specified periods of time
- Display messages

TRANZ 330 EPROM version 3.30 and greater, and all TRANZ 380 releases, feature a generic login that can be programmed at the application level. Previously, all logins were hard-coded in the EPROM requiring that new firmware be created to add each new protocol. This feature accommodates ACCUNET and GEISCO logins, requires fewer field EPROM upgrades, and allows faster protocol support development.

Note: In international and industrial versions of XL EPROMs greater than 2.70, TRANZ 330 EPROMs greater than 3.40, and TRANZ 380, the only hard coded login supported is Tymnet. All other industrial and international EPROMs must have logins coded with the soft (generic) login method. Domestic versions do support hard-coded logins with the exception of TRANZ 330, version 3.60

Procedure Follow the current method for specifying logins by adding a login specifier to the end of a phone number. The specifier instructs the operating system to check a memory location for data on logging into a network protocol specifier, user name, user password, or other IDs.

Note: TRANZ 380 memory locations that correspond to those listed in this section have 4 digits (020=0020, 029=0029, etc.).

You may continue to use "Ln" following the phone number to select a login, where "n" represents a number from 0 to 9 (referencing memory locations 020 - 029). When the terminal dials a phone number and encounters "Ln", the operating system will continue to execute the data at that location. This procedure selects a login that is contained in the EPROM and provides the username, password, and other parameters.

If you wish to select a new login, use "Xn" following the phone number, where "n" represents a number from 0 to 9 (referencing memory locations 020 - 029). When the terminal dials the phone number and encounters "Xn",

the operating system will execute the login control string referenced in memory location "n".

Note: This memory location should be dedicated to performing only a login, then return back to allow normal transaction flows to occur after the login is completed. This was not designed to execute this memory location and do the entire transaction.

Format The format in memory locations 020 - 029 will remain the same, except that the first parameter will represent the login control string to execute rather than a login selection. The remaining parameters (user name, user password, user location, and location password) separated by a hyphen, will not change.

For example:

"350-ABCDEF-1234-XYZ-A1"

In this example, the operating system will execute the login control string at memory location 350 and include a user name of "ABCDEF", a user password of "1234", a user location of "XYZ", and a location password of "A1".

Login Control String Commands Access of these four parameters depends upon proper use of the "+X" command. The login control string may use any TCL commands supported in the EPROM.

The login sequence is as follows:

- The carrier is raised
- The operating system executes the login control string
- The terminal waits 30 seconds for an <ENQ>

The TRANZ 330/380 terminal will continue to display all current system messages and error messages.

Three new commands, +P, +X and +Y, are used to help set the login protocol parameters. Refer to section 5, TCL Commands, for details. These new commands are used the same as TCL commands, allowing looping for error recovery.

Exercise caution when using various TCL commands. For example, prompt display commands "F" and "P" will not operate correctly when executed in a login string because of the way they function. To display a message properly during a login, select a buffer, clear the buffer, append the data to be displayed, and use the "V" command to display the contents of the buffer.

You may use other commands in the login provided they are designed for controlling communication and logins. The three new login commands are not limited to login strings. They may be used in any other control string.

Appendix J. Industrial EPROM Bar Code Differences

The ZON 530, the ZON 531, the ZON 540, and the ZON 541 are the four VeriFone terminals that comprise the ZON 5XX series. EPROMs that are specifically made for the ZON 5XX series are known as "industrial" EPROMs, but their primary feature is enhanced capability for bar code reading. The ZON 531 and the ZON 541 are capable of reading bar codes in the card slot with the bar code facing left (magnetic stripes face right). Except for the EPROMs, the ZON 530 is like the TRANZ 330, and the ZON 540 is like the TRANZ 340. The ZON 531 is a bar code slot version of the ZON 530; the ZON 541 is a bar code slot version of the ZON 540. These terminals are available in either plastic or metal cases. A bar code wand or a bar code gun scanner may be attached to the DIN 6 port. Contact VeriFone OEM Sales in Atlanta for further information. Bar code symbologies that are available are code 39, interleaved 2 of 5, and UPC-A (and the latter's superset known as EAN-13). For other bar code symbologies that are not yet available via an EPROM, the user may purchase certain gun scanners that decode the bar code data within that peripheral device.

Differences Between Standard and Loose Industrial EPROMs for Interleaved 2 of 5	
Loose I2 of 5 EPROM	Standard I2 of 5 EPROM
Slightly hardened against substitution errors	Very hardened against substitution errors
Can read poorer quality bar codes	Generally requires high quality bar code printing
Minimum number of digits allowed is 4	Minimum number of digits allowed is 2

TCL Deletions for Industrial EPROMs

Only the following eight fixed prompts are available to the TCL programmer (no hard coded logins such as TYMNET can be used):

Fixed Prompt No.	Prompt
1	ENTER ACCOUNT #
2	EXPIRY DATE MMYY
3	AMOUNT OF SALE?
47	ENTER PASSWORD
59	INVALID PASSWORD
73	PRINTING ...
125	INSERT FORM ...
126	... PRESS ENTER

Fourth Optional "*U" Parameter

The TCL program operating on non-industrial EPROMs has no way of knowing whether bar code data was read on the first attempt at scanning, or after many attempts, because only a good read is given to the TCL logic. On industrial EPROMs, the "*U" logic is informed that the present bar code scan is either a good read or a no-read. If there is a no-read, two bytes consisting of "I" and an upper case letter error code are put in the interrupt output buffer.

Industrial EPROMs have a fourth (optional) parameter in the "*U" command. This parameter represents the number of TCL commands to skip on a no-read (unsuccessful bar code scan). The TCL programmer may include logic to display or print the error code and/or determine a bar code first read rate via this parameter. Another potential use of this capability is for monitoring the number of scan attempts to read each label, in order to help determine whether a label should be replaced or whether a user needs to be trained on better wand techniques.

Using the *Y Command Before the *U Command

With the original industrial EPROMs, if the *Y TCL command precedes the *U command in the TCL logic flow, the software will neither acknowledge a no-read nor provide the error code, because the *Y logic only identifies good reads. Altering *Y to accommodate this limitation would prevent upward compatibility of prior TCL applications. The ZON 540 and ZON 541 EPROM 6P2FY370 for code 39 as well as the ZON 530 and ZON 531 EPROM 5P6DY370 for I2 of 5 do allow the error code to be passed from the *Y command to the *U command, and it is expected that other EPROMs to come will behave similarly.

Code 39 Error Codes Available Using "*U" 4th Parameter

When the terminal's software detects a no-read, (assuming the "*Y" command does not logically precede the "*U" command and the fourth parameter of "*U" is used), one of the following error codes will appear:

- I B There were too many bars and spaces for the input buffer (a maximum of 23 code 39 characters may be read).
- I C A bar was too wide or the wand was too slow.
- I D There were too many consecutive spots, voids, etc.
- I E There was an improper number of bars/spaces.

Appendix J. Industrial EPROM Bar Code Differences

I F	There was an indecisive number of wide spaces for a character.
I G	There was no start character.
I H	There was no stop character.
I I	A start/stop character occurred in the middle of the bar code.
I J	The wide space variation was too great.
I K	The wide bar variation was too great.
I L	The narrow space variation was too great.
I M	The narrow bar variation was too great.
I N	There was a poor gap between the wide and narrow spaces.
I O	There was a poor gap between the wide and narrow bars.
I P	There was excessive ink bleeding.
I Q	There was insufficient ink or a poor ribbon.
I R	There was a giant void or spot.
I S	The intercharacter gap (ICG) was too large. (The ICG should be the narrow space width unless a daisywheel-type bar code printer is used. Such printers have the forty-four code 39 bar code patterns in the wheel. This software test is especially valuable for distinguishing the code 39 symbology from the I 2 of 5 symbology.)
I T	There was a check digit error.
I V	There were too many bars and spaces for the maximum character size specified.
I W	There were too few bars and spaces.
I X	Software was adjusting to significant change in wand velocity during a defect (not likely to ever occur).
I Y	Characters \$/+% are not currently allowed (special option must be chosen for this to occur).

Note: The vertical bar character is part of the error code, but it cannot be entered from the terminal keypad.

The following lists of error codes are available using the fourth parameter of the *U TCL command.

Standard I2 of 5 Error Codes	I B	There were too many bars and spaces for the input buffer (a maximum of 40 I2 of 5 digits may be read).
	I D	There were too many consecutive defects (spots, voids, etc.).
	I E	There were an improper number of bars/spaces.
	I F	There was too great a velocity change.
	I I	There was no start or stop character.
	I J	The wide space variation was too great.
	I K	The wide bar variation was too great.
	I L	The narrow space variation was too great.
	I M	The narrow bar variation was too great.
	I N	There was a poor gap between the wide and narrow spaces.
	I O	There was a poor gap between the wide and narrow bars.
	I P	There was excessive ink bleeding.

	I Q	There was insufficient ink or a poor ribbon.
	I S	There was a giant void or spot.
	I T	There was a check digit error.
	I U	A bearer bar was detected.
	I V	There were more data characters than the maximum specified.
	I X	Software was adjusting to significant change in wand velocity during a defect (this is not likely to ever occur).
Loose I2 of 5 Error Codes	I A	There was too much inconsistency within a digit pair.
	I B	There were too many bars and spaces for the input buffer (a maximum of 40 I2 of 5 digits may be read).
	I D	There were too many consecutive defects (spots, voids, etc.).
	I E	There were an improper number of bars/spaces.
	I F	There was too great a velocity change.
	I I	There was no start or stop character.
	I N	There was a poor gap between the wide and narrow spaces.
	I O	There was a poor gap between the wide and narrow bars.
	I T	There was a check digit error.
	I V	There were more data characters than the maximum specified.
	I W	There was a two digit checksum error.
	I X	Software was adjusting to significant change in wand velocity during a defect (this is not likely to ever occur).

Example Using 4th Parameter of "*U"

```
%5E2DU370 ; Example of ZON 530 EPROM version
30=*U PARAMETER 4; ; Idle prompt
40=SCAN BAR CODE;
41=TRY AGAIN;
42=COUNT = ; ; Use #2 for count of consecutive
; no-reads
970=1; ; Select bar code wand
; Begin host key 1 program
100=1;
104=1;
107$ *N#2 ; Put zero in counter #2
P40 ; Display "SCAN BAR CODE"
B5.5 ; Select the only source and work
; buffer for program
L120 ; Go to memory location 120
120$ G ; Clear the selected destination buffer
*U...2 ; input from wand/keypad to destination buffer
; Skip 2 if no-read, but go below if good read
; View the selected buffer for 3 seconds
*V.2.6 L107 ; Go to memory location 107
U50 ; Copy the selected buffer to memory
; location 50
G ; Clear the selected destination buffer
*O#2 A42 ; Increment count of consecutive no-reads
; Append "COUNT = " to the destination
; buffer
+Q#2 R32 ; Append count to the selected buffer
A50 ; Append space to the selected buffer
; Append saved error code to destination
; buffer
```

Appendix J. Industrial EPROM Bar Code Differences

```
V.2.6      ; View the selected buffer for 3 seconds  
P41       ; Display "TRY AGAIN"  
L         ; Repeat current memory location, which  
          ; is 120  
; End of program
```

The +U Command for Bar Code Initialization

The +U command sets DIN 6 communication parameters and bar code initialization parameters.

The format is +Ux,y,a,b,c,d,e where:

a = bar code symbology type, etc.

For code 39: <empty> or 0

For interleaved 2 of 5

For EPROMs in which only one symbology is valid, <empty> or 0 will allow that one symbology, and the specific designated number will allow that symbology. Any other value (excluding the exceptions below) will cause the +U logic to ignore all parameters after "x" and "y".

80 enable bar code reading (normal default state without this command).

This cancels the +U..81 command. If 80 is entered, parameters beyond "a" are illegal and are not examined by the +U logic.

81 disable bar code reading (power-up or +U..80 cancels this). If 81 is entered, parameters beyond "a" are illegal and are not examined by the +U logic.

Values between 82 and 99 inclusive are reserved for special use (some-times experimental), and no particular response is claimed if such values are used.

If there is nothing beyond the symbology type parameter in the +U command, the remaining +U parameters will maintain their previous settings or return to default settings.

b = minimum number of data characters allowed

For code 39: 1 = b = 32. Default is 1

For Interleaved 2 of 5:

for Loose: 4 = b = 40. Default 4

for non-Loose (standard): 2 = b = 40. Default 2

If the slot bar code scanner in the ZON 531/541 is to be used, it is desirable to specify this minimum parameter (in fact, the highest number consistent with the application). This achieves the goal of allowing a 1/4 inch quiet zone on the bar coded cards to be used in the slot.

c = maximum number of data characters allowed

For code 39: 1 = c = 32. Default is 32 whether empty, 0, or from 33 to 255 inclusive.

For Interleaved 2 of 5:

for Loose: 4 = c = 40. Default is 40 whether <empty>, 0, or from 41 to 255 inclusive.

for non-Loose: 2 = c = 40. Default is 40 whether <empty>, 0, or from 41 to 255 inclusive.

d = independent options that are unique to certain bar code symbologies. Default zero. Any value will be accepted.

For code 39, sum the values of bits 0, 1, 2, 3, 4, 5, 6 which are defined as follows:

Bit 0 is set to perform mod 43 check digit verification.

Bit 1 is set to delete the mod 43 check digit from the *U command's input buffer and the diagnostics mode display.

Bit 2 is set to perform extended code 39 decoding, which allows all 128 ASCII characters to be represented.

Bit 3 is set if the intercharacter gap (ICG) software test is to be omitted. This test should be omitted if a daisywheel type printer is being used to print the bar codes.

Bit 4 is set if the four valid code 39 characters \$/+% are declared "not permissible" (declared a no-read if found) until this declaration is voided by a future +U command or a power-up occurs. This prevents the possibility of a substitution error due to severe wearing away of a bar code.

Bit 5 is set in order to disable omission of spot/voids as well as to omit tests for error codes M L P Q R S. (*This is safe against substitution errors with tolerance parameter 72, and is moderately safe with tolerance parameter 74, but this bit set is even risky with the default of no tolerance parameter.*)

Bit 6 is set to enable omission of spots in the quiet zone up to 40 percent of the narrow bar width. For quite narrow bars and high speed scanning, this may omit a first true narrow bar, so this should only be done when needed.

For I2 of 5, sum the values of bits 0, 1, 2, 5, 6 which are defined as follows:

Bit 0 is set to perform check digit verification.

Bit 1 is set to delete the bit 0 check digit from the *U command's input buffer and the diagnostics mode display.

Bit 2 is only available if Loose. Bit 2 is set to enable the two digit checksum.

Bit 0 and bit 2 should not both be set because the logic can not handle both checksums at once. The two digit checksum requires a unique addend that depends on the particular user's design. Since Loose I2 of 5 does not allow the tolerance parameter "e", that parameter is used to specify the unique two digit checksum addend if it is used. The maximum addend is 99, and the value 100 prevents the two digit checksum calculation.

Bit 5 is NOT available if Loose I2 of 5.

Bit 5 is set in order to disable omission of spot/voids as well as to omit tests for error codes M L P Q R. (*This is safe against substitution errors with tolerance parameter 72, and is moderately safe with tolerance parameter 74, but this bit set is even risky with the default of no tolerance parameter.*)

Bit 6 is NOT available if Loose.

Bit 6 is set to enable omission of spots in the quiet zone up to 40 percent of the narrow bar width. For quite narrow bars and high speed scanning,

Appendix J. Industrial EPROM Bar Code Differences

this may omit a first true narrow bar, so this should only be done when needed.

e = two digit checksum addend if Loose, or tolerance parameter if not Loose. If Loose, the default is 0 or <empty>. The maximum value is 99, and a value greater than 100 is ignored.

The following parameter should be used with caution, especially in any application in which serious consequences may result if a substitution error occurs. If it is possible at reasonable cost, it is better to improve the quality of the bar codes than to resort to using this parameter.

e = tolerance parameter. Permissible values are 0, 72, 74, 76, 78, 80 and 82. The default is 0 which requires good quality bar codes and affords the greatest protection against substitution errors among all tolerance parameters.

Code 39 and non-Loose I2 of 5 allow 0, 72, 74, 76, 78, and 80. However, values between 1 and 71 inclusive

produce the default, and values between 82 and 255 inclusive produce the default.

73 is treated as 72 (but rejected in diagnostics mode).

75 is treated as 74 (but rejected in diagnostics mode).

77 is treated as 76 (but rejected in diagnostics mode).

79 is treated as 78 (but rejected in diagnostics mode).

81 is treated as 80 (but rejected in diagnostics mode).

72 requires a nominal wide to nominal narrow element width ratio of at least 3 to 1, but otherwise allows a greater variation than the default for each of the 4 element types. This affords reasonably good protection against substitution errors.

74 requires a nominal wide to nominal narrow element width ratio of at least 2.5 to 1, but otherwise allows a greater variation than the default for each of the 4 element types. This affords fair protection against substitution errors.

76 allows fair quality bar codes with slight risk of substitution errors.

78 allows poor quality bar codes with high risk of substitution errors. This is the most tolerant parameter if spots and voids exist.

80 allows poor quality bar codes with high risk of substitution errors. This is the most tolerant parameter if NO spots/voids exist.

Diagnostics Mode Bar Code Input for Industrial EPROMs

When in the idle loop, simultaneously pressing the [*] and [3] keys causes the display "DIAGNOSTICS". Then, pressing [BACKSPACE] causes the display "BAR CODE TEST" for one second, after which "BARCODE +U PARAM" is displayed, indicating that the user may now set any of the four +U parameters. The user is now at STATE 1.

When a display ends in "OK", the input parameter was accepted. When an input parameter is expected and at least one but fewer than four digits are entered whose value is zero, the default is automatically accepted and "DEFAULT OK" is appended to the display. When an input parameter is expected and four or more digits are entered, "PLEASE TRY AGAIN" is displayed and then the user is at STATE 1. When an input parameter is ex-

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pected and a digit value is entered that is out of the allowable range, "PLEASE TRY AGAIN" is displayed, and then the user is at STATE 1.

STATE 1 Keypad input when any of the following three are displayed:

"BARCODE +U PARAM"
"PLEASE TRY AGAIN"
"xxx OK".

(*"xxx" represents variable display of variable length*)

Keypad Input	Result
any digit	Display "PLEASE TRY AGAIN" and go to STATE 1
[CLEAR]	Go to abort and then idle loop
[ENTER]	Display "BAR CODE TEST" and go to STATE 6
[BACKSPACE]	Display "MIN=" and go to STATE 2
[ALPHA]	Display "MAX=" and go to STATE 3
[*]	Display "OPT=" and go to STATE 4
[#]	Display "TOL=" and go to STATE 5 or for the Loose I2 of 5 EPROM: Display "CHK=" and go to STATE 5

STATE 2 Keypad input when the display is "MIN=" which awaits input for the minimum number of bar code characters required for acceptance of the bar code. If less bar code data is received than is required for the minimum number of characters, the scan is ignored so that not even an error code is produced. For code 39 the allowable range is 1 to 32 inclusive. For standard I2 of 5 the allowable range is 2 to 40 inclusive. For loose I2 of 5 the allowable range is 4 to 40 inclusive. The minimum allowed in the range is the DEFAULT in this state.

Keypad Input	Result
[ENTER]	Append "DEFAULT OK" to display and go to STATE 1
[CLEAR]	Display "PLEASE TRY AGAIN" and go to STATE 1
[BACKSPACE]	Display "PLEASE TRY AGAIN" and go to STATE 1
[ALPHA]	Display "PLEASE TRY AGAIN" and go to STATE 1
[*]	Display "PLEASE TRY AGAIN" and go to STATE 1
[#]	Display "PLEASE TRY AGAIN" and go to STATE 1
no. in range	Append "OK" to display and go to STATE 1
[ENTER]	
bad value	Display "PLEASE TRY AGAIN" and go to STATE 1
[ENTER]	

STATE 3 Keypad input when the display is "MAX=" which awaits input for the maximum number of bar code characters allowed for a good read of the bar code. If more bar code data is received than is allowed for the maximum number of characters, the error code "V" is produced.

For code 39 the allowable range is 1 to 32 inclusive.

For standard I2 of 5 the allowable range is 2 to 40 inclusive.

For loose I2 of 5 the allowable range is 4 to 40 inclusive.

The maximum allowed in the range is the DEFAULT in this state.

Description of keypad input is the same as in STATE 2.

STATE 4 Keypad input when the display is "OPT=" which awaits input for the options value. The allowable range is 0 to 127 inclusive, but only those bits that are meaningful for the utilized bar code symbology are activated.

Zero is the DEFAULT in this state.

Description of keypad input is the same as in STATE 2.

STATE 5 For loose I2 of 5, this is for keypad input when the display is "CHK=" which awaits input for the two digit checksum addend parameter. Otherwise this is for keypad input when the display is "TOL=" which awaits input for the tolerance parameter.

For code 39 and standard I2 of 5 the allowable tolerance values are 0, 72, 74, 76, 78, 80.

For loose I2 of 5 any value from 0 to 100 inclusive is allowed.

Zero is the DEFAULT in this state.

Description of keypad input is the same as in STATE 2.

STATE 6 The display "BAR CODE TEST" remains until a bar code is scanned or [CLEAR] is pressed (see below). During bar code scanning, if a bar code consisting of more than 16 characters is displayed, the scroll forward key (#) and the scroll backward key ([*]) are functional.

Keypad Input	Result
[CLEAR]	Go to abort and then the idle loop.

Industrial Commands

Following are unique parameters of two commands you will use when programming the ZON 5XX terminals. See the appropriate commands in section 5 of this manual for parameters common to all terminal types.

E Input from the Cardreader or Keypad.

Description: This command description is intended for use by ZON 5XX programmers when programming industrial terminals and does not provide a full listing of all the E command parameters. Refer to page 5-37 for a full description of the E command and the first 5 parameters s1, a1, j, s2 and i used for the 5XX series. Listed below are command formats for industrial terminals ZON 530/531 and ZON 540/541 as well as descriptions of the two parameters, "s3" and "t", that are unique to these terminals.

Category: Data Entry

Buffer Status:	Source Buffer	Destination Buffer
----------------	---------------	--------------------

No change	Buffer updated
-----------	----------------

Terminals Supported:	Terminal	Special Conditions
----------------------	----------	--------------------

ZON 530/531	parameters a2, c, and s3 not used
ZON 540/541	parameters a2 and c not used

Command Format:
(ZON 530/531)

Es1.a1.j.s2.i.t

Parameters:

Parameter	Default Value	Description
<i>(Note: See pages 5-38 and 5-39 for parameters s1, a1, j, s2 and i.)</i>		
t	0	Optional; timeout in seconds (0 - 255, 0 = no timeout). After a "bad" mag card read and the message 'PLEASE TRY AGAIN' appears on the display, the timeout begins. When the timeout expires the requirement to obtain a good card read is canceled and the idle string is entered (simulated *K0)

Command Format:
(ZON 540/541)

Es1.a1.j.s2.i.s3.t

Parameters:

Parameter	Default Value	Description
<i>(Note: See page 5-34 for parameters s1, a1, j, s2 and i.)</i>		
s3	0	Number of commands to skip of three bad card reads (ZON 540/541 only)
t	0	Optional; timeout in seconds (0 - 255, 0 = no timeout). After a "bad" mag card read and the message 'PLEASE TRY AGAIN' appears on the display, the timeout begins. When the timeout expires the requirement to obtain a good card read is canceled and the idle string is entered (simulated *K0)

M Input from the Cardreader Only

Description: Causes the terminal to accept input from the cardreader only to place a field separator after the data entry and append the data to the destination buffer. When this command is used, there is no input type or data length restriction. If the user presses a key, the terminal beeps, displays CARD ENTRY ONLY for three seconds and returns to the idle prompt.

Category: Data Entry

Buffer Status:	Source Buffer	Destination Buffer
	No change	Buffer updated

Terminals Supported: **Terminal** **Special Conditions**

XL	Parameters "s", "a", "c" not available
TRANZ 330/340	Parameters "s", "a", "c" not available
TRANZ 380	None
ZON 530/531	Parameters "a", "c", "s" not available
ZON 540/541	Parameters "a", "c" not available

Note: See page 5-91 for descriptions of "a" and "c" parameters.

Command Format:
(ZON 530/531)



Parameters:

Parameter	Default Value	Description
t	0	Optional; timeout in seconds (0 - 255, 0 = no timeout). After a "bad" mag card read and the message 'PLEASE TRY AGAIN' appears on the display, the timeout begins. When the timeout expires, the requirement to obtain a good card read is canceled, and the idle string is entered (simulated *K0).

Appendix J. Industrial EPROM Bar Code Differences

Command Format:
(ZON 540/541)

Ms.t

Parameters:

Parameter	Default Value	Description
s	0	Number of commands to skip if three bad card reads. <i>WARNING: If you wish to enter a value other than "0", omit the second parameter in order for the command to function.</i>
t	0	Optional; timeout in seconds (0 - 255, 0 = no timeout). After a "bad" mag card read and the message 'PLEASE TRY AGAIN' appears on the display, the timeout begins. When the timeout expires, the requirement to obtain a good card read is canceled, and the idle string is entered (simulated *K0). <i>WARNING: If this parameter is a value other than "0", the first parameter will be deactivated.</i>

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Appendix K. Command Groups

The following chart groups TCL commands for quick reference. This list is the basis for the "See Also" category in section 5. *TCL Commands* which references all possible commands that may apply to the particular function you are programming.

Command Group	Command	Function
6-Pin DIN Communications	*H	Encrypt PIN
	+H	Wait for PIN
	+T	Send over DIN 6
	+U	Set DIN 6 Parameters
Append Data to Buffer	A	Append from Memory Location
	J	Append Clock Data
	Q	Append Write Control Character
	+Q	Append Variable to Buffer
	R	Append Constant
	+V	Append Signon Message
	X	Append From Source
	Y	Append Non-Blank Memory Location
Arithmetic	*O	Arithmetic on Variables
	T	Arithmetic on Memory Location
Batch	*A	Create/Open Batch
	*B	Select Batch
	*C	Copy Buffer to Batch
	*D	Delete Batch Information
	*E	Copy Batch Detail to Buffer
	*F	Detect Data Capture Errors
	+G	Append Detail Record to Batch
Buffer	B	Select Buffers
	D	Delete Characters from Buffer
	G	Clear Destination
	H	Search for String
	+J	Buffer Modification
	O	Move Extraction Pointer

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Command Group	Command	Function
Comparison	+A	Compare Variable
	+C	Buffer Comparison
	I	Comparison Operator
	*X	Select Account Range
Delete	D	Delete Characters From Buffer
	*D	Delete Batch Information
	G	Clear Destination
Display	F	Display Fixed Prompt
	*J	Justify Display
	P	Display Custom Prompt
	V	Display Buffer
End Control String	*K	Abort
	*M	Explicit Return
Input	E	Input from Card Reader or Keypad
	+E	Input Variable Decimal Point
	K	Input from Keypad Only
	M	Input from Card Reader Only
	*U	Input from Bar Code Reader
	*Y	Check Input Devices
LAN Commands	+I	LAN Send and Receive
	*T	Specify Communications Timeout
	*V	Append LAN Status Code
Modem Commands	+D	Tone Dial
	+F	Response ACK
	+I	Send/Receive Over Modem
	+K	Carrier Control
	+M	Set Modem Parameters
	*P	Specify Characters
	*R	Specify Device, Speed and Format
	S	Dial Phone Number
	*T	Specify Timeouts
	*V	Append Phone Status
	+X	Transmit Data to Network
	+Y	Receive Data from Network
Printing	N	Send Buffer to Printer
	W	Wait for Print Buffer
Program Control	L	Link to Control String
	*L	Call Subroutine
	*M	Explicit Return
RS-232 Communications	*I	Send Over RS-232
	N	Send Buffer to Printer
	*R	Specify Device, Speed and Format
	+R	Set RS-232

Appendix K. Command Groups

Command Group	Command	Function
Size	+S	Get Buffer Size
	*S	Get Memory Size
	*Z	Calculate Free Bytes
Verification Commands	+B	Calculate Block Character
	C	Verify Check Digits
Terminal Control	*G	Terminal Beep
	+L	Lock and Unlock Keypad
Variable	+A	Compare Variable
	*N	Set Variables
	*O	Arithmetic on Variables
	+Q	Append Variable to Buffer
	*Q	Set Variable from Buffer
Wait Commands	+P	Timeout in Milliseconds
	W	Wait for Print Buffer
	*W	General Wait

TCL Programmer's Manual

Glossary

Abort	To stop or cancel the execution of a program before it reaches its normal end. Control is returned to the terminal's operating system and whatever is currently on the display is left there.
AC	Alternating Current—used as a primary source of power by power packs and power supplies.
Access Code	A code number dialed to gain access to a telephone line, such as number "9" dialed to reach an outside line.
Account Number	(1) A unique series or group of digits used to numerically identify each cardholder. (2) The unique identification number assigned to the account of a specific party, within a given institution.
ACK	The acknowledgement control character sent from one device to another to indicate the message packet transmitted passed the block check.
Activity File	A listing of the most recent transactions in a terminal, group of terminals or system containing sufficient information to permit detection of fraudulent repetitive transactions.
Adjustment	Action taken to correct a cardholder or merchant account or to satisfy an inquiry.
Algorithm	The method used in coding or decoding a message. In conjunction with a key, algorithms provide the ability to electronically decipher an electronic security system (i.e., PINs for debit cards).
Alpha	A means of allowing you to use the keypad to enter alphabetic characters.
Alphanumeric	Capable of utilizing both alphabetic and numeric characters, such as a terminal display or keypad or a computer keyboard.
Append	To add more data to the end of an existing file.
Application	A software program designed with special codes stored in memory for a specific purpose or customer.
Application ID	The number identifying which application is to be downloaded by the ZONTALK 2000 software from an IBM PC compatible computer.
ASCII	An abbreviation for American Standard Code for Information Interchange. This standard code is used for transmitting data and is composed of 128 characters in 7-bit binary format.

Auto Dial	A memory dial feature that automatically dials phone numbers stored in the terminal's memory. To use this feature you must have a standard telephone connected to the terminal and at least one phone number stored in the terminal's memory.
Bar Code	A printed code used for identification purposes consisting of vertical lines of varying spacing and thickness. This code is read by drawing the tip of a bar code wand across it.
Bar Code Wand	A pencil- or wand-shaped optical scanner for reading bar codes.
Batch File	A file containing a series of transaction details to be processed as a single unit.
Batch Header	A unique heading or title that identifies a batch.
Baud	The signaling speed equal to the number of signal events per second. Not necessarily the same as bits per second.
Beep Flag	Parameter set in memory location 009/0009 that indicates whether or not the terminal should beep when the keys are pressed.
Buffer	A temporary storage area capable of holding up to 250 characters; see "Source Buffer" and "Destination Buffer".
Byte	A group of consecutive bits that make up a character or a logical unit or information. A byte usually consists of eight bits.
Calendar/Clock Chip	An electronic battery-backed component in the terminal that keeps track of the date and time.
Call Center	An authorizing response indicating that a call needs to be made to the issuer's security or credit officer.
Cardholder	A person to whom a card has been issued or who is authorized to use such a card.
Cardreader	The slot on the right side of the PNC, XL and TRANZ terminal that automatically reads the magnetic stripe on back of a credit or bank card. The terminal features an ABA Track 2 cardreader. For special applications, an ISO Track 1 cardreader can be installed. The TRANZ 380 features Tracks 1, 2 and 3.
Carrier	A frequency signal or tone sent over the telephone (or communication) line and modulated by the modem to transmit/receive data.
Character	A letter, number, punctuation, figure or other symbol used in a message or in a control function.
Check Digit	An extra digit appended to a numeric value, such as an account number, to verify the number's accuracy.

Constants	Values used during the execution of the application program that remain unchanged; see "string constant" and "numeric constant".
Content	The entire addressable data in a memory location.
Control String	A series of Terminal Control Language commands linked together to control the execution of a terminal operation; see "Transaction Control String" and "Function Control String".
Control Characters	Transmitted characters having special or significant meaning to the receiving device.
Credit	The power to buy or borrow on trust; or a sum of money due a person; or to add a sum of money to the account.
Custom Application	An application created to meet the specialized needs of an individual, company or institution.
Custom Prompt	A prompt, programmed by a user and stored in one of the terminal's general record memory locations.
Data	Information used by the terminal or peripheral that relates to a specific transaction or operation.
Data Capture	The process of capturing transaction data and storing it in the terminal's RAM for processing at a later time.
Debit	A charge to a customer's bank or other account number.
Debugging	The process of researching and solving bugs (errors) in a program.
Default	A value automatically assigned by the program when another value has not been specified.
Destination Buffer	A "write only" buffer into which you can copy data from the source buffer, or pull the contents of any other buffer, and write to it.
Detail File	A transaction file used to later update a master file.
Diagnostics	The procedure for detecting and isolating a problem with a terminal or peripheral.
Direct I/O	Programming communications at the application level that does not default communications in the operating system.
Display Panel	The vacuum fluorescent panel on the PNC, XL and TRANZ terminals that displays up to 16 characters. Display includes fully-formed numerals, letters and punctuation symbols and includes information entered from the keypad, instructions, prompts and error messages.
Download	The process of transferring data from one computer or terminal to another.

Echo	A process where the receiving device re-transmits or "echoes back" transmitted data so that the originating device can ensure that the data sent was received correctly.
ENQ	An ENQuiry character used in data transmission to initiate the transfer of data.
EOT	The End of Transmission control character sent from one device to another to indicate the end of each transmission.
EPROM	Erasable Programmable Read-Only Memory. A type of memory chip permanently stored in the terminal. Contains the standard application, operating system and fixed prompts.
ETX	End of Text.
File	A collection of logically related records.
Firmware	The basic instructions built into the terminal, stored in ROM and executed automatically.
Fixed Prompt	A "generic" prompt residing in the terminal's ROM; fixed prompts may be called using the "F" command.
Flag	A programmed indicator such as a character or digit used for identification.
Fraud Control	Measures taken to prevent unauthorized use of a credit, debit, or ATM card during a transaction. For example, a fraud control measure may require that the user re-enter the last four digits of a card's account number.
Function	An operation that can be performed without communicating with a host computer.
Function Control String	A control string designed to control the execution of a specific terminal function.
General Record	A piece of data stored in a "general record" memory location for general use during the execution of a program.
Handshaking	The process of exchanging codes, or control characters, between two terminals. The codes are predetermined and establish a connection between both terminals.
Hexadecimal Number	The hexadecimal number system has a base of 16 and uses the symbols 0 - 9 and A - F.
Host	An authorizing center computer used to process a transaction; also called a host computer.
Idle Prompt	The information shown on the display panel when the terminal is not performing any operations or transactions. Defaults to the date and time.
Increment	To add a quantity, usually 1, to another quantity.

Interface	The means by which communication between two systems (i.e., terminal to computer, computer to computer) takes place.
Leased Line	A private telephone line connection directly to another party.
Local Area Network (LAN)	A system consisting of communications devices connected for the purpose of sharing information and equipment.
Local Functions	Operations performed at the terminal only and generally not with a host computer. Up to seven are permitted and these are accessed by pressing the [FUNC/ENTER] key followed by the desired function key.
Login	Password information for a particular organization that allows access to a public switched network (e.g., Telenet, Tymnet).
Login String	A code consisting of a network code, user name and password used to login to a network.
LRC	Longitudinal Redundancy Check. The last encoded bit on the informational tracks of the magnetic stripe which provides hardware control of the track parity from start sentinel to end sentinel. Used in communication on the end of each packet after the ETX to help ensure data received was data sent.
Luhn Check Digit	A fraud control measure used in transactions. (Also called Mod 10.)
Memory Dump	A procedure, usually on paper, disk or tape, that shows the contents of a terminal's memory at a specified point in time. This procedure is used for troubleshooting or debugging problems in programs.
Memory Location	A specific location in the terminal's memory that may be accessed by a three-digit address (also known as a memory location number).
Memory Map	A listing of the assigned uses of memory locations in a terminal.
Message Format Flag	A flag used to select one of the 16 transaction control strings comprising the standard application available with the terminal.
Modem	Short for modulator/demodulator; a device that converts electronic data to audio signals (for transmission over telephone wires) and audio signals back to electronic data.
Multiple Transactions	The capability of performing several back-to-back transactions during a single call to a host computer.
NAK	Short for Negative Acknowledgement Character. The control character sent from one device to another to indicate the message packet transmitted did not pass the block check.
Network	The communications systems used to initiate an authorization request. Usually refers to a public switched network (e.g., Telenet, Tymshare). Networks help callers reach a remote computer that cannot be easily accessed by direct telephone connection.

NULL	The absence of information, distinguished from 0 or blank.
Numeric Constant	Positive or negative numbers whose values are used during the execution of the application program.
Packet	A collection of data bits that contain both control characters (e.g., STX, ETX, etc.) and data. The basic unit of transmission in a packet switched network. Network-specific control information is carried in the packet, along with the data, to provide for such functions as addressing, sequencing, flow control and error control. A packet can be of fixed or variable length, but generally has a specified length.
Packet Switched Networks	Networks that divide information into packets so the host computer's processing time is evenly distributed among different users.
Parameters	Information stored in memory that identifies the terminal configuration for use with transactions and other operations.
Password	A protected word or set of characters that identifies or authenticates a user.
Peripheral	An attached device (e.g., a printer or PIN Pad), not the central processing device or computer; typically used for I/O.
PIN	Personal Identification Number. A 4- to 16-digit confidential code or electronic signature used by card holders to identify themselves as the proper users of a credit or debit card to the host computer.
Pointer	Indicator that points to character position within source buffer in TCL.
Post Dialing	A feature that dials the host computer after all of the account and transaction information is entered into the terminal and overrides a predial command.
Printer Type Flag	Memory location 008/0008 which specifies which printer is connected to the terminal. The parameter entered takes into account the baud rate, parity enabled, printer type, handshake type and parity.
Prompt	A message or series of alphanumeric characters to be displayed on the terminal's screen requesting user input.
Protocol	A formal set of rules governing the format and timing of messages exchanged between devices in a communication systems, such as between the terminal and host.
Pulse Dialing	A method of telephone dialing that specifies a phone number by the number of electrical pulses sent.
RAM	Random Access Memory used to store data capture records, custom applications and temporary data entered during a transaction; divided into segments called memory locations.
RECALL Function	Terminal function that displays and changes data stored in a memory location.

ROM	Read Only Memory permanently stored in the PNC, XL and TRANZ terminals. Contains the standard application, fixed prompts and operating system.
Scroll	To move text across a display screen.
Serial Port	Circuitry in the PNC, XL and TRANZ terminals with a DIN connector for communicating with download computers, other terminals, peripherals and printers.
Source Buffer	A "read only" buffer into which you can pull the contents of any of the terminal's five buffers for review.
STORE Function	Terminal function that allows you to store data in a single memory location. If data is already stored in that location, the STORE Function will replace the existing data with the new data.
String Constant	A sequence of alphanumeric characters enclosed in single quotation marks; for example—'SLIDE CARD' or '1991'.
STX	Start of Text; the beginning of a message packet.
Subroutine	A group of commands within a program that perform a particular function; subroutines may appear anywhere in the program, and may be called any number of times during the program.
Swipe	The action of sliding a card through the cardreader.
TCLOAD	An assembler and download program designed by VeriFone that converts TCL source code into a format suitable for downloading into the terminal.
Terminal Control Language (TCL)	A proprietary programming language designed by VeriFone for the purpose of programming a PNC, XL or TRANZ terminal.
Timeout	A specified period of time in which the terminal stops processing or undertakes a predetermined alternate action. Command "**T" sets the length of various communications timeout periods.
Transaction	An operation requiring the terminal to process data to accomplish a predetermined task.
Transfer	To move data from one location to another.
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 holds only four characters.
User	The person who is using the PNC, XL or TRANZ terminal.

Variables	Temporary work bytes used to express numeric values; up to ten variables may be specified on a per transaction basis; a variable can have a value of 0 to 255 on TRANZ version 1.2 and below and all XL versions and a value ranging from 0-65535 on PNC 330/340 and TRANZ versions 1.3 or greater, and all versions of TRANZ 380.
Void	To clear or delete a transaction; a type of transaction that deletes data from the terminal or host computer.
Write Control Character (WCC)	A special bit-mapped code that tells the host whether to use a single or multi-transaction protocol, or whether an account number was read from a magnetic stripe or manually entered from the keypad.
ZONTALK 2000	A communication program for IBM PC compatible computers used to download applications from the computer to a terminal.

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