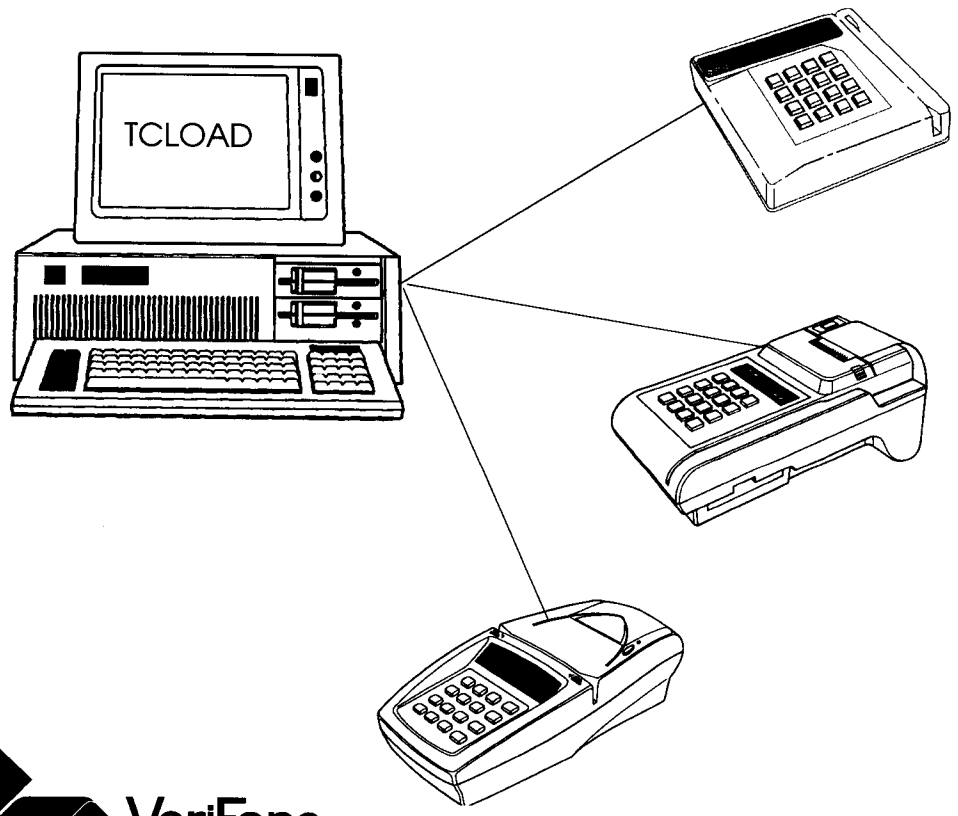
TCLOAD

Reference Manual

VeriFone Part Number 10016, Revision E
Manual Revision 1.0



VeriFone®
THE TRANSACTION AUTOMATION COMPANY

TCLOAD

Reference Manual

VeriFone Part Number: 10016, Revision E
Manual Revision 1.0

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1. Introduction

What is TCLOAD?

TCLOAD is a development tool that simplifies the process of assembling and downloading application programs written for the XL, the TRANZ® 330, the TRANZ 420, and TRANZ "UDL" terminals (TRANZ 380, TRANZ 460, TRANZ 470 and above). TCLOAD, the Terminal Control Language (TCL™) assembler, quickly assembles and compresses your ASCII TCL files into terminal executable control strings that can be directly downloaded to an XL® or TRANZ terminal or stored in the PC as a downloadable application file.

As a development tool, TCLOAD provides speed and modularity to the application developer. For non-TRANZ 380 terminals, TCLOAD compresses data before downloading it, greatly reducing the download time. TCLOAD features an "include" file directive that allows you to write various terminal functions in separate TCL files or modules, then link the modules together into one file. This one file can then be directly downloaded to the target XL, TRANZ 330, TRANZ 380, or TRANZ 4xx terminal, or stored on the PC as a downloadable application file. ZONTALK, a VeriFone download program, would use the application file to perform either a direct download, or download a terminal via modem.

Who Should Use TCLOAD?

TCLOAD is a software tool for TCL application developers. Using TCLOAD, you can create a documented TCL file on any PC word-processor capable of generating an ASCII formatted file, delimited with a carriage return and line feed.

TCLOAD can produce a memory image (for a direct download) and two types of output files: DXL/DTZ and UDL. The file you use to download the terminal may vary, depending on where you are in the development cycle.

During the application development stages, you use the direct download option to download the application from your PC to the terminal. You usually perform this type of download to inject the application program into an XL or TRANZ terminal for testing purposes. When you use the direct download feature, TCLOAD prepares a memory image of the application program,

and transfers the image, via the XL/TRANZ direct download cable, Part Number 00446-04 (to IBM AT) or 00446-05 (to IBM PC).

Note: TRANZ UDL terminal download protocol does not support the memory image download format used with other VeriFone terminals. See Section 4, TRANZ UDL Terminal Packet Formats.

When you have completed the application program testing and are ready to download the released application, use either the DXL/DTZ file or UDL file. Both the DXL/DTZ file and the UDL file are used by ZONTALK. Copy the .DXL/.DTZ and .UDL files from the TCLOAD application program to the ZONTALK program diskette. ZONTALK uses the .DXL/.DTZ file to perform a direct download, via the XL/TRANZ download cable, at 2400/19,200 baud. ZONTALK uses the .UDL file to download the application program via modem at 300/1200 baud. This last download method is the normal method used to download XL/TRANZ terminals already in the field. See the ZONTALK 2000 Reference Manual, Part Number 10361, for more information on ZONTALK direct downloads and auto downloads.

What is the Terminal Control Language?

The Terminal Control Language (TCL) is the application language of the XL and the TRANZ terminals. Originally designed to reduce the development time of custom Point-Of-Sale (POS) applications for XL and TRANZ terminals, the flexibility of the TCL and the terminal have enabled the XL and TRANZ terminals to penetrate other markets, including the original equipment manufacturer (OEM) market.

The TCL includes commands for memory storage, printing, dialing, transmitting data packets, and a variety of other operations. By combining TCL commands into control strings (a series of commands), you can determine how the terminal performs various transactions and functions.

A control string is a series of TCL commands terminated with a carriage return and line feed. Control strings and their associated data are stored in "memory locations" in the terminal's virtual memory space. Each memory location has a 3- or 4-digit address, and can accommodate up to 120 characters (60

characters in earlier EPROM releases). Following is a sample control string to be stored in Memory Location 021.

021B4.4GA200U210

The actual control string is "B4.4GA200U210".

The size of each memory location is predetermined by the XL and TRANZ operating system. See Appendices A through F for complete XL and TRANZ memory maps.

Available Documents

TCLOAD Reference Manual, VeriFone Part Number 10016 (this manual)

TCL Programmer's Manual, VeriFone Part Number 00368

TRANZ 330 Reference Manual, VeriFone Part Number 00483

TRANZ 380 Reference Manual, VeriFone Part Number 11452

TRANZ 420 Reference Manual, Verifone Part Number 10663

TRANZ 460 Reference Manual, VeriFone Part Number 12412

TRANZ 470 Reference Manual, VeriFone Part Number 25492

XL 300 Reference Manual, VeriFone Part Number 10996

ZON Jr XL Reference Manual, VeriFone Part Number 00369

ZONTALK Reference Manual, VeriFone Part Number 00363

ZONTALK 2000 Reference Manual, VeriFone Part Number 10361

2. Getting Started

System Requirements

TCLOAD is an easy-to-operate software development tool designed to run on the IBMPC®, IBM XT®, IBM 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 (to connect the XL or TRANZ terminal to the IBM-PC), available from VeriFone, Part Numbers:

  00446-04 TRANZ/XL to IBM PC/AT (DB-9)
  00446-05 TRANZ/XL to IBM PC or XT (DB-25)

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 will be maintained and updated whenever a new firmware release occurs and can be downloaded from VeriFone.

The files you need are TCLOAD.EXE and TCLOAD.DBS located in VFI07:[TOOLS.TCL_TOOLS.RELEASE].

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 tries 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, as explained in Section 3, *Executing TCLOAD*, however, you must 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 the TCLOAD file directives. TCLOAD file directives control the processing of the TCL commands while running the TCLOAD program.

TCLOAD File Directives

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.

Terminal Operating System Version Number

During a direct download, 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 most accurate EPROM version number available. 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 reverts to the default XL version and prompts you to "CONTINUE? [Y/N]".

The EPROM OPSYS software version displays on the front panel of the terminal when it is first powered up. This value should be used with the version directive "%".

The following example shows how to set the EPROM version for OPSYS software version 3.00 of the TRANZ 330.

```
%3E2CU300      ;version 3.00
```

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

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 OPSYS software version and the path names for each each of the TCL function files. The following example shows an include file which links two TCL files.

%3E2CU300
@C:\BATCH.INC
@C:\DATA.INC

Comments 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 (;) comments 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 comments directive.

%3E2CU300 ; this is version 3.00 of the OPSYS
@C:\Batch.INC ; include the batch settlement file
; A comment directive can also begin on column one.

Data Declaration Directive

The data declaration directive, the equal (=) sign, assigns a string of data to a memory location. When using the data declaration directive, write the 3- or 4-digit memory location address beginning in column one, and use the following format:

NNN=STRING
NNNN=STRING

Where:

NNN = the 3-digit memory location address;
NNNN = the 4-digit memory location address ;
STRING = the string of data.

The following example shows a prompt being assigned to 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 3- or 4-digit memory location address beginning in column one, and use the following format:

NNN$STRING
NNNN$STRING

Where:
NNN = 3-digit memory location address;
NNNN = 4-digit memory location address;
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 terminal. This type of download is ideal for updating phone numbers and 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
STRING = the TCL control string

or

&NNN=STRING
&NNNN=STRING

Where:
NNN = 3-digit memory location
NNNN = 4-digit memory location
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         ; Put it up and wait
```

Note: You can also use the ZONTALK "Mark Entry" feature to mark memory locations for partial download. Consult the ZONTALK 2000 Reference Manual for more information on marking memory locations for partial download.

Memory Image Terminal File Format

File lines pertaining to full or partial downloads to a memory image terminal (XL, TRANZ 330 or TRANZ 420) look like this:

Xnnndata

where X=0 for partial download and X=1 for full download.

TRANZ UDL Terminal File Format

The remaining TRANZ family of UDL terminals (TRANZ 380, TRANZ 460, TRANZ 470 and higher) support 2000 memory locations. A UDL file line must be able to accommodate larger memory addresses and looks like this:

X,nnn,data

where "nnn" may be a 1-, 2-, 3-, or 4-digit address.

3. Executing TCLOAD

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 MS-DOS prompt, type:

TCLOAD filename.ext -option1 -option2 ...

Where:

TCLOAD = the program command name
filename.ext = the name of your application program file
option = one of the TCLOAD options

TCLOAD options include:

-B Use alternate database file. This option requires the name of a valid database file to follow the command option.

-V Use alternate EPROM version. This option requires a valid EPROM ID following the command. It may be used to override the EPROM ID listed in the text file, or it can be used to provide an EPROM ID if one is not provided, as in a device download without a text file, or when the text file does not list the EPROM ID.

-Z Add device driver. This option requires the name of a valid Device Driver file to follow the command option. This command may be used as with a TCL program or in a standalone fashion. When used alone, it must be accompanied by the -V option to provide an EPROM ID. *(Not supported by the TRANZ UDL terminal.)*

-D Create memory image file. This command directs TCLOAD to create a .DTZ/.DXL file for direct downloads with VLOAD. This option must be used with a TCL test file in order to create a .DTZ/.DXL file. *(Not supported by the TRANZ UDL terminal.)*

-U Create .UDL file for ZONTALK downloads. This option must be used with a TCL text file in order to generate a .UDL file. Device drivers specified with the -Z option are included in the .UDL file.

-A Mark all .UDL locations for parameter download. This option directs ZONTALK to download all locations during a partial download, in effect, causing a full download.

-T Direct download to a terminal. This option downloads the terminal with a TCL program or a Device Driver or both. An optional parameter ("n") may follow the command to specify which port to download from. The default is COMM 1 if "n" is not supplied.

-R Create .RCL file for RAM cartridge downloads. This option must be used with a TCL text file in order to generate a .RCL file.

-C This option has been eliminated.

Note: Option commands are not case sensitive. Separate each option command with one or more spaces. Options may be combined and are interpreted from left to right. [CTRL] [C] aborts the download process.

To view the TCLOAD options, just type "TCLOAD" without any arguments.

Memory Image Options D and Tn

As the TCLOAD program runs, it assembles the TCL files and creates a temporary storage area in the PC's memory. This PC storage area is called a memory image because it is identical to the application memory area of XL/TRANZ. Two command options control the storage direction of the memory image: "D" and "T".

The "D" option directs TCLOAD to attach a header to the image and store it in a file with the extension "DXL" for the XL or extension "DTZ" for the TRANZ 330/420. Following is an example of the TCLOAD command using the "D" option:

TCLOAD XLAPPL.XL -d

This command causes TCLOAD to store the memory image in a file called XLAPPL.DXL. ZONTALK uses this file to perform a direct download to an XL/TRANZ terminal physically connected to the PC's serial port.

Note: Option "D" is not supported by the TRANZ UDL terminal.

The "Tn" option directs TCLOAD to transfer or download the memory image, via COM port n, to the XL/TRANZ terminal. The following example shows the TCLOAD command using the "T2" option for downloading an XL application:

TCLOAD XLAPPL.XL -t2

This command causes TCLOAD to create a memory image of the XLAPPL application. After TCLOAD assembles the TCL files and creates the memory image, it displays the "WAITING FOR UNIT" prompt. Verify the PC is properly connected to the target XL terminal. At the terminal's keypad, press the [FUNC] key, then the [#] key.

TCLOAD begins downloading the memory image to the target terminal via COM port 2. As the download progresses, TCLOAD displays the status message *Sending Block X of N,* where X is the current block and N is the total number of blocks to be downloaded. Upon successfully completing the download, TCLOAD displays the *Load Successful* message.

ZONTALK Modem Download Option U

The "U" option directs TCLOAD to create a ZONTALK compatible file and assign a "UDL" extension to it. ZONTALK uses this UDL file to download XL or TRANZ terminals via modem. The following example shows the TCLOAD command using the "U" option:

TCLOAD XLAPPL.XL -u

The UDL file lists each memory location and its contents in double quotes.

"0131GA50V.2.4"

Notice that Memory Location 131 has a leading zero. The leading zero (0) is a flag indicating the location should not be downloaded during a ZONTALK partial download. Those memory locations marked for partial download (using the "&" partial download directive) will have a "1" preceding the memory location number.

Mark All Option A

The "A" option can only be used with the "U" option to mark all the locations in the UDL file for partial download. The following example shows the TCLOAD command using both the "U" and "A" options.

TCLOAD XLAPPL.XL -u -a

This command marks all the memory locations in the XLAPPL.UDL file for partial download. When a terminal calls in for the XLAPPL application, ZONTALK downloads the entire UDL file.

Database File Specification Option B <filename>

The "B" option enables you to specify the file name of the firmware description database file if you do not install it in your current directory or in your search path. You must add "-b <filename>" to the TCLOAD command so that it knows where to look for the file on either the hard disk or a floppy disk.

The following example shows the TCLOAD command using the "-b" option:

TCLOAD XLAPPL.XL -b \new\tcl.tbl

This command uses the file \NEW\TCL.TBL to look up the EPROM characteristics.

Add Device Driver Option Z

The "Z" option requires that you add the name of a device driver following the command. Use it as with a TCL program or alone, in which case it must be accompanied by the -v option to provide an eprom ID. The following example shows the TCLOAD command using the "Z" option:

TCLOAD STW0008.TCL -z COM1TI1.DRV -t1

Note: Option "Z" is not supported by the TRANZ UDL terminal.

Firmware Version ID Option V <vers>

The "V" option enables you to change the version ID from the command line. Add "-v <vers>" to the TCLOAD command, where <vers> is the version you specify. The following example shows the TCLOAD command using the "-v" option:

TCLOAD XLAPPL.XL -v 3e2au120

This command loads the terminal as if it contained the EPROM version 3E2AU120.

File Format Conversion Option R

This command creates a file called APPL.RCL which is formatted for loading to a RAM cartridge that will be sent to a terminal in the field for direct RAM load.

TCLOAD APPL.TCL -r

Error Handling

TCLOAD error reports now include a 3-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 of severity
- 3-digit number
- 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 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. 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 that triggered this error message and send it to VeriFone so that the problem can be corrected as soon as possible.

Appendix I contains a numerical listing of error codes along with definitions and an explanation of the procedure to use for correcting the error.

Other XL/TRANZ Error Messages

Besides the TCLOAD error reports already discussed and listed in Appendix G, there are two more commonly known error messages that frequently appear on both XL and TRANZ terminals: *PROGRAMING ERR* and *DC MEMORY ERR*.

PROGRAMMING ERR

In the XL/TRANZ terminal, application program integrity is assured by maintaining a running checksum on the area of RAM within the terminal where the application program resides. Every time a terminal memory location is changed, either via the keyboard or under direction of the TCL application running in the terminal, the updated information is stored into RAM, and a checksum on the new program area RAM is calculated and stored into system RAM. Every time the terminal executes a warm boot, which occurs after power up and after each transaction or function, it checks program memory integrity by again calculating the checksum on the program area of memory and comparing it to the stored value of what the checksum should be. If the two checksum values do not match, corruption of the program memory area has occurred and the *PROGRAMMING ERR x* message is displayed, where "x" is an error code that indicates the type of operation running at the time of the error and when the error occurred — either at the start or end of the operation.

Table 3-1. PROGRAMMING ERR Codes

Operation Type	Begin Operation	Finish Operation
Power-up	0	
Store from TCL	1	2
Dial-up download	3	4
Store from keypad	5	6
Unit-to-unit download	7	8

DC MEMORY ERROR

The terminal assures integrity of the data capture area of RAM in the same way it does the program memory area. A separate checksum for DC RAM is maintained and like the program RAM, is confirmed in each warm boot of the terminal. Corruption of data capture RAM is signaled by the *DC MEMORY ERROR* message. The display of either the *PROGRAMMING ERR* or *DC MEMORY ERROR* message indicates that corruption of the terminal's memory has taken place.

Causes

There are basically four main categories that cause memory corruption to occur and *PROGRAMMING ERR* or *DC MEMORY ERROR* messages to be displayed:

- The operating system
- Operational procedures
- Hardware failures
- Environmental causes

Operating System

On rare occasions, the operating system may be responsible for memory corruption. In such cases, memory corruption has most often been due to electrostatic discharge (ESD), brownouts, blackouts, or environmental conditions.

Communication Errors

There are some conditions during which you should expect a memory corruption error to occur. For example, for performance considerations, the program area checksum is calculated only at the end of a ZONTALK download. If a communication error occurs, or the terminal is powered down once the download has begun, you can expect to see a *PROGRAMMING ERR* message.

Terminal-to-Terminal Download with Batch Data

Performing a unit-to-unit download from a terminal which already contains data capture information will result in a *DC MEMORY ERROR* display on the unit that received the download, since this type of download includes the DC or batch data but not the DC RAM checksum. Downloading a TRANZ UDL terminal that has data capture information clears the DC memory. No message is displayed.

Operational Procedures

Another common cause of memory corruption is the operational procedures employed by the end user, based on the specific application being run on the terminal. Since the process of storing to memory is a 2-step procedure (store new data, recalculate, then store the updated checksum), removal of power at any time during memory storage is likely to cause memory corruption. If the application displays a host approval prior to completing all memory updates, and a customer removes power from the unit prior to the completion of these memory updates, memory corruption may occur.

Power Outages

Power outages (blackouts or brownouts) can also cause memory corruption while the TCL application is executing. Keep this in mind for applications that utilize idle loop control strings.

Hardware Failure

Another general category of memory corruption causes is hardware failures. Bad RAM chips, dead batteries, etc., though uncommon, can cause memory corruption problems.

Environmental Conditions

The final cause of memory corruption is due to environmental conditions. Power problems such as brownouts or excessively noisey power or telco lines may result in memory corruption. The most commonly observed environmental cause for memory corruption, however, is electrostatic discharge (ESD) in or near the unit. Each winter, calls regarding *PROGRAMMING ERR* and *DC MEMORY ERROR* messages on terminals increase because cold, dry weather increases the presence of ESD to levels that can affect the operation of VeriFone terminals.

VeriFone has specifications for ESD immunity and XL/TRANZ products currently meet or exceed these specifications.

Corrective Actions to Take

What can be done once a *PROGRAMMING ERR* or *DC MEMORY ERROR* occurs? Once the memory corruption has been detected and the error message is displayed, the terminal waits for input from the keyboard to continue operation. In current firmware, there are two options if a *PROGRAMMING ERR* has occurred:

- Press the [5] and [3] keys simultaneously.
- Press the [1] and [ENTER] keys simultaneously.

Pressing the [5] and [3] keys simultaneously will cause the terminal to recalculate and store the program area of checksum, and attempt to continue operation. If the corruption of RAM has been slight, you may be able to continue operating on the corrupted terminal. VeriFone suggests that the only operation you should attempt is to close out any batch files in process and re-download the terminal. If the corruption is severe, or if vital areas of system memory have been corrupted, the terminal may immediately go back into another *PROGRAMMING ERR* or it may progress to a *DC MEMORY ERROR.*

The *PROGRAMMING ERR* condition can always be cleared by pressing [1] and [ENTER] simultaneously to reinitialize all RAM and clear the terminal of its application. You must then redownload the application to continue terminal operation.

When a *DC MEMORY ERROR* occurs, the only way to proceed beyond the error condition is by pressing the [1] and [ENTER] key sequence. The terminal then resets its data capture memory pointers, effectively deleting any batch information that was in the terminal. Note that the application program area of RAM is not affected by this error condition.

Warning: The TRANZ UDL terminal allows the [5] and [3] keypress to recover from DC MEMORY ERROR. The data will be corrupted but accessible, therefore the only operations recommended are closing, reconciling and uploading, after which you should redownload the terminal.

4. TRANZ UDL Terminal Packet Formats

This section describes packet formats for uploading and downloading ASCII data to and from a TRANZ UDL terminal. It also includes sample dialogs between terminal and host.

Note: Packet formats for the XL, TRANZ 330 and TRANZ 420 terminals are precompressed and not user readable.

Use these packet formats and dialogs only when the terminal and host are directly connected or connected via telephone lines.

Communication Parameters

Settings for all packets are as follows:

Line Settings	Value
Bits	8
Parity	None
Stop Bits	1
Time out	10 seconds
Retry count	3 tries

Control Characters

STX = $02;
ETX = $03;
EOT = $04;
ACK = $06;
NAK = $15;
FS = $1C;
ETX' = $83; *(Note: This is an ETX with high order bit on)*

Format: <STX> packet data <ETX'><CRC1><CRC2>

The 2 byte CRC is computed as follows:

G(x) = x^16 + x^15 + x^2 + 1
CRC1 = hi(CRC), CRC2 = lo(CRC)

Note: The maximum length of any packet from <STX> to final <CRC2> must not exceed 250 bytes.

Download Request Terminal to Host

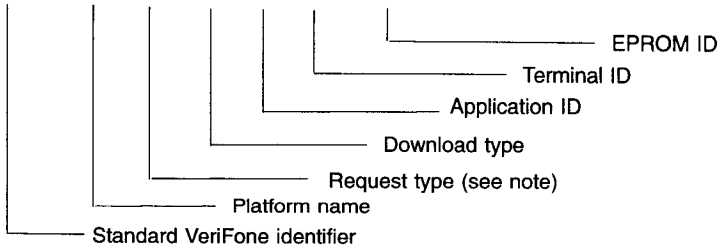
The TRANZ UDL terminal uses the standard VeriFone request packet format, beginning with VFI and using commas as field separators.

Format

Data	No. Bytes or Type
<STX>	1
VFI	3
,	1
Platform name	variable
,	1
Request type	variable
,	1
Download type	1
,	1
Application ID	variable (7 max)
,	1
Terminal ID	variable (10 max)
,	1
<ETX>	1
<CRC1>	1
<CRC2>	1

Example

<STX>VFI,TRANZ-380,XT380,F,MX0105,1,9EADU3.6E,<ETX><CRC1><CRC2>



Note: The "request type" field begins with "X" to eXecute the service request. The remainder of the field specifies the service type, in this example "T380". It determines the appropriate routine to call or program to execute.

Packet Types

The TRANZ UDL terminal uses different packet types for up and download requests. Following is a list of packet types, a description of each, plus format details and some examples.

Table 4-1. TRANZ UDL Terminal Packet Types

Download Request - Terminal to Host		Download Request- Host to Terminal	
Type		**Type**	**Function**
L	Memory location record	M	Display message
F	Data capture header	P	Set password
D	Data capture record	T	Set date and time
Upload Request - Host to Terminal		S	Successful session
U	Specific location	U	Cancel session
A	All non-empty locations		
B	All data capture data (batches)		

Memory Location Record (Packet Type L)

Use this packet type to transfer data consisting of a location and an associated data component. The terminal stores the data in the location file using the given location. The location may range in value from 0 to 1999 and is used as a logical location by the terminal to access the location file.

Format

Data	No. Bytes or Type
<STX>	1
L	Location record
Location	variable (numeric ONLY)
<FS>	1
Data	variable
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example <STX>L51<FS>EXPIRATION DATE<ETX'><CRC1><CRC2>

Note: Compete packet length must not exeed 250 bytes.

Data Capture Header (Packet Type F)

Use this packet type to create a new file or select an existing file using the name provided. Subsequent data capture information is stored in this file.

Format

Data	No. Bytes or Type
<STX>	1
F	File Select
File name	variable
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example <STX>FABC1219<ETX'><CRC1><CRC2>

Data Capture Record (PacketType D)

Use this packet type to transfer data into the file selected with the "F" type packet. The terminal always appends the data to the end of the file. The TRANZ UDL terminal always stores the data sequentially and ignores the offset field.

Format

Data	No. Bytes or Type
<STX>	1
D	Data capture record
offset	variable
<FS>	1
Data	variable
<ETX'>	1
<CRC1>	1
<CRC2>	1

Host to Terminal Upload Formats

The TRANZ UDL terminal is capable of performing three types of uploads:

- Specific memory locations
- All non-empty memory locations
- All data capture files

Requests may be done in any order and more than one type of request may be issued.

Specific Location (Packet Type U)

This format is used by a host to request the uploading of a specific location.

Format

Data	No. Bytes or Type
<STX>	1
U	Upload specific request
Location	variable
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example <STX>U151<ETX'><CRC1><CRC2>

The terminal responds to this request with an "L" type packet for the requested location.

All Non-empty Locations (Packet Type A)

This format is used by the host to request that the terminal upload all non-empty locations. The terminal replies with a stream of "L" type packets. After the final "L" packet, the terminal sends an "S" packet to terminate the upload.

Format

Data	No. Bytes or Type
<STX>	1
A	Upload All Locations
<ETX'>	1
<CRC1>	1
<CRC2>	1

Note: Locations 2 and 3 used by the terminal as transmit and receive buffers will be uploaded. These typically contain meaningless data and should be ignored.

All Data Capture Data (Packet Type B)

This format is used by the host to request that the terminal upload all data capture data (batches). For each data capture file, the terminal sends an "F" type packet followed by zero or more "D" type packets. After the final "D" packet, the terminal sends an "S" packet to terminate the upload.

Format

Data	No. Bytes or Type
<STX>	1
B	Upload all batches
<ETX'>	1
<CRC1>	1
<CRC2>	1

Host to Terminal Download Formats

The TRANZ UDL terminal supports the following services:

- Immediately displays a message
- Set the system password
- Set the data and time
- Successfully completes a session
- Cancels a session

Display Message (Packet Type M)

This packet is used by the host to cause the terminal to immediately display a message. This packet type is typically used to display such status message as: "DOWNLOADING", "DOWNLOAD DONE", "UPLOADING", and "UPLOAD DONE". The length of the message text should not exceed the physical

length of the TRANZ UDL terminal display (16 characters). This packet type may be sent at any time while communicating with the terminal.

Format

Data	No. Bytes or Type
<STX>	1
M	Display message
message	variable
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example <STX>MDOWNLOAD DONE<ETX'><CRC1><CRC2>

Set the Password (Packet Type P)

This packet is used typically during deployment to set the system password.

Format

Data	No. Bytes or Type
<STX>	1
P	Set the password
password	variable, 10 characters max
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example <STX>P1234<ETX'><CRC1><CRC2>

Set the Date and Time (Packet Type T)

This packet type is used typically during deployment to set the terminal date and time. The terminal automatically computes the day of the week based on the date. All data is numeric and requires leading zeros if necessary.

Format

Data	No. Bytes or Type
<STX>	1
T	Set the time
YYYY	4,year
MM	2,month
DD	2, day
hh	2,hour 24 hour format
mm	2, minute
ss	2,second
<ETX'>	1
<CRC1>	1
<CRC2>	1

Example

<STX>T19901219132702<ETX'><CRC1><CRC2>
This entry sets the date to 12/19/1990, the time to 1:27:02 PM, and computes the day of the week to be Wednesday.

Successful Session (Packet Type S)

This packet type is used by both the host and terminal to indicate successful completion of a communication sequence. If it is sent by a host, the terminal calculates and saves the checksum. After sending this packet, the host should wait for the acknowledgement, then send an <EOT> to cause the terminal to disconnect.

Format

Data	No. Bytes or Type
<STX>	1
S	Successful session
<ETX'>	1
<CRC1>	1
<CRC2>	1

Unsuccessful Session (Packet Type U)

This packet type is used by the host to abort a communication sequence.

Format

Data	No. Bytes or Type
<STX>	1
U	Unsuccessful session
<ETX'>	1
<CRC1>	1
<CRC2>	1

Dialog Examples

After the TRANZ UDL terminal receives a packet and verifies the CRC, it parses the commands within the packet from left to right, on a field by field basis.

Following are illustrations of typical communication sessions, however they are not definitions of any precise sequence that must be followed. Many other possibilities exist. For example, the download host could request a specific upload, then download data based on the upload response.

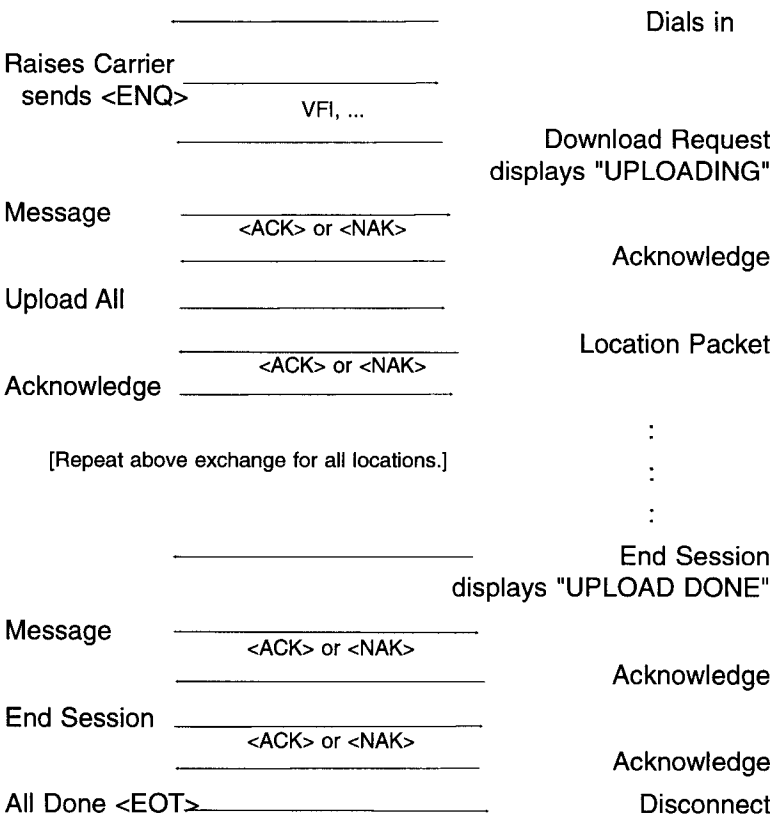
Download Dialog

Download Host		Terminal
	——————→	Dials in
Raises Carrier sends <ENQ>	——————→	
	←—— VFI, ... ——	Download Request
		displays "DOWNLOADING"
Message	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
Location Packet	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
:	[Repeat above exchange for all locations.]	
:		
Time Packet	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
Password Packet	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
		displays "DOWNLOAD DONE"
Message	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
End Session	——————→	
	←—— <ACK> OR <NAK> ——	
	←——————	Acknowledge
All Done <EOT>	——————→	Disconnect

Notes:

1. *Message packets are optional and may also be sent at other times.*
2. *Setting the time and password is usually done during initial deployment. These steps are shown for illustration purposes only.*

Upload Dialog



Note: Message packets are optional and may also be sent at other times.

Appendix A. XL Memory Map

Following is the memory map for the XL terminal that uses software version XE2AU300. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alphanumeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

XL Memory Map

Location	Info Type/ Length	Description
000	X(20)	Download Phone Number
001	X(10)	Serial Number
002		Transmit Buffer
003		Receive Buffer
004	9(6)	Date
005	9(4)	Message Sequence Number
006	9(2)	Number of Characters to Scroll
007	9(1)	Multi Trans Timeout (number of 20s intervals)
008	9(5)	Printer Type
009	9(1)	Beeper on/off
010	9(1)	Dial Type Flag; tone or pulse
011	9(1)	Speed Dial Flag
012	9(1)	Parallel Phone Available Flag
013	9(1)	Number of Retries
014	9(1)	Line Test
015	9(3)	Extended Redial Flag (2.80+)
016	X(120)	General Records
017	9(1)	RECALL and Clock Setting Restriction
018	9(16)	Error Statistics
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

	Location	Info Type/ Length	Description
	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)	Function Key #1 Control String
	032	X(120)	Function Key #2 Control String
	033	X(120)	Function Key #3 Control String
	034	X(120)	Function Key #4 Control String
	035	X(120)	Function Key #5 Control String
	036	X(120)	Function Fey #6 Control String
	037	X(120)	Out-of-Memory Control String
	038	X(120)	Reserved
	039	X(120)	Function Key #9 Control String
	040	X(120)	General Record 40
	|		
	099	X(120)	General Record 99
HOST 1	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)	Terminal ID
	105	9(3)	Message Format Flag
	106	9(3)	Fraud Control Flag
	107	X(120)	Control String
	108	X(16)	Host Identifying Prompt
	109	9(4)	Floor Limit
	110	X(120)	Response Analysis Control String
	111	X(120)	Data Capture/Print Control String
	112	9(1)	Multi Trans Group
	113	X(120)	General Location 113
	|		
	199	X(120)	General Location 199

	Location	Info Type/ Length	Description
HOST 2	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)	Terminal ID
	205	9(3)	Message Format Flag
	206	9(3)	Fraud Control Flag
	207	X(120)	Control String
	208	X(16)	Host Identifying Prompt
	209	9(4)	Floor Limit
	210	X(120)	Response Analysis Control String
	211	X(120)	Data Capture/Print Control String
	212	9(1)	Multi Trans Group
	213	X(120)	General Location 213
	|		
	299	X(120)	General Location 299
HOST 3	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)	Terminal ID
	305	9(3)	Message Format Flag
	306	9(3)	Fraud Control Flag
	307	X(230)	Control String
	308	X(16)	Host Identifying Prompt
	309	9(4)	Floor Limit
	310	X(120)	Response Analysis Control String
	311	X(120)	Data Capture/Print Control String
	312	9(1)	Multi Trans Group
	313	X(120)	General Records
	|		
	399	X(120)	General Records

	Location	Info Type/ Length	Description
HOST 4	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)	Terminal ID
	405	9(3)	Message Format Flag
	406	9(3)	Fraud Control Flag
	407	X(120)	Control String
	408	X(16)	Host Identifying Prompt
	409	9(4)	Floor Limit
	410	X(120)	Response Analysis Control String
	411	X(120)	Data Capture/Print Control String
	412	9(1)	Multi Trans Group
	413	X(120)	Reserved
	|		
	499	X(120)	Reserved
HOST 5	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)	Terminal ID
	505	9(3)	Message Format Flag
	506	9(3)	Fraud Control Flag
	507	X(120)	Control String
	508	X(16)	Host Identifying Prompt
	509	9(4)	Floor Limit
	510	X(120)	Response Analysis Control String
	511	X(120)	Data Capture/Print Control String
	512	9(1)	Multi Trans Group
	513	X(120)	Reserved
	|		
	599	X(120)	Reserved

	Location	Info Type/ Length	Description
HOST 6	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)	Terminal ID
	605	9(3)	Message Format Flag
	606	9(3)	Fraud Control Flag
	607	X(120)	Control String
	608	X(16)	Host Identifying Prompt
	609	9(4)	Floor Limit
	610	X(120)	Response Analysis Control String
	611	X(120)	Data Capture/Print Control String
	612	9(1)	Multi Trans Group
	613	X(120)	Reserved
	|		
	699	X(120)	Reserved
HOST 7	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)	Terminal ID
	705	9(3)	Message Format Flag
	706	9(3)	Fraud Control Flag
	707	X(120)	Control String
	708	X(16)	Host Identifying Prompt
	709	9(4)	Floor Limit
	710	X(120)	Response Analysis Control String
	711	X(120)	Data Capture/Print Control String
	712	9(1)	Multi Trans Group
	713	X(120)	Reserved
	|		
	799	X(120)	Reserved

	Location	Info Type/ Length	Description
HOST 8	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)	Terminal ID
	805	9(3)	Message Format Flag
	806	9(3)	Fraud Control Flag
	807	X(120)	Control String
	808	X(16)	Host Identifying Prompt
	809	9(4)	Floor Limit
	810	X(120)	Response Analysis Control String
	811	X(120)	Data Capture/Print Control String
	812	9(1)	Multi Trans Group
	813	X(120)	Reserved
	|		
	899	X(120)	Reserved
HOST 9	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)	Terminal ID
	905	9(3)	Message Format Flag
	906	9(3)	Fraud Control Flag
	907	X(120)	Control String
	908	X(16)	Host Identifying Prompt
	909	9(4)	Floor Limit
	910	X(120)	Response Analysis Control String
	911	X(120)	Data Capture/Print Control String
	912	9(1)	Multi Trans Group
	913	X(120)	Reserved
	|		
	999	X(120)	Reserved

Appendix B. TRANZ 330 Memory Map

Following is the memory map for the TRANZ 330 terminal that uses software version 3E2EU340 and 3E2DU352. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alphanumeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

Location	Info Type/ Length	Description
000	X(20)	Download Phone Number
001	X(10)	Serial Number
002		Transmit Buffer
003		Receive Buffer
004	9(6)	Date
005	9(4)	Message Sequence Number
006	9(2)	Number of Characters to Scroll
007	9(1)	Multiple Transaction Timeout
008	9(5)	Reserved
009	9(1)	Beeper On/Off
010	9(1)	Dial Type Flag, Tone or Pulse
011	9(1)	Speed Dial Flag
012	9(1)	Parallel Phone Avaliable Flag
013	9(1)	Number of Retries
014	9(1)	Line Test
015	9(3)	Delay Before Auto Answering Phone
016	X(120)	Encrypted Working Key/Master Key Pointer
017	9(1)	RECALL and Clock Setting Restriction
018	9(16)	Error Statistics
019	X(7)	Application Identification
020	X(120)	Login String #0
021	X(120)	Login String #1
022	X(120)	Login String #2
023	X(120)	Login String #3

	Location	Info Type/ Length	Description
	024	X(120)	Login String #4
	025	X(120)	Login String #5
	026	X(120)	Login String #6
	027	X(120)	Login String #7
	028	X(120)	Login String #8
	029	X(120)	Login String #9
	030	X(16)	Idle Prompt
	031	X(120)	Function Key #1 Control String
	032	X(120)	Function Key #2 Control String
	033	X(120)	Function Key #3 Control String
	034	X(120)	Function Key #4 Control String
	035	X(120)	Function Key #5 Control String
	036	X(120)	Function Key #6 Control String
	037	X(120)	Out of Memory Control String
	038	X(120)	Auto Answer Control String
	039	X(120)	Function Key #9 Control String
	040	X(120)	General Record 40
	|		
	099	X(120)	General Record 99
HOST 1	100	X(20)	Primary Phone Number
	101	X(20)	Secondary Phone Number
	102	X(16)	Call Center phone number
	103	X(16)	Referral Phone Number
	104	X(46)	Terminal ID
	105	9(3)	Message Format Flag
	106	9(3)	Fraud Control Flag
	107	X(120)	Control String
	108	X(16)	Host Identifying Prompt
	109	9(4)	Floor Limit
	110	X(120)	Response Analysis Control String
	111	X(120)	Auxiliary Control String
	112	9(1)	Multi Trans Group
	113	X(120)	General Location 113
	|		
	199	X(120)	General Location 199

	Location	Info Type/ Length	Description
HOST 2	200	X(20)	Primary Phone Number
	201	X(20)	Secondary Phone Number
	202	X(16)	Call Center phone number
	203	X(16)	Referral Phone Number
	204	X(46)	Terminal ID
	205	9(3)	Message Format Flag
	206	9(3)	Fraud Control Flag
	207	X(120)	Control String
	208	X(16)	Host Identifying Prompt
	209	9(4)	Floor Limit
	210	X(120)	Response Analysis Control String
	211	X(120)	Auxiliary Control String
	212	9(1)	Multi Trans Group
	213	X(120)	General Location 213
	I		
	299	X(120)	General Location 299
HOST 3	300	X(20)	Primary Phone Number
	301	X(20)	Secondary Phone Number
	302	X(16)	Call Center phone number
	303	X(16)	Referral Phone Number
	304	X(46)	Terminal ID
	305	9(3)	Message Format Flag
	306	9(3)	Fraud Control Flag
	307	X(120)	Control String
	308	X(16)	Host Identifying Prompt
	309	9(4)	Floor Limit
	310	X(120)	Response Analysis Control String
	311	X(120)	Auxiliary Control String
	312	9(1)	Multi Trans Group
	313	X(120)	General Location 313
	I		
	399	X(120)	General Location 399

	Location	Info Type/ Length	Description
HOST 4	400	X(20)	Primary Phone Number
	401	X(20)	Secondary Phone Number
	402	X(16)	Call Center phone number
	403	X(16)	Referral Phone Number
	404	X(46)	Terminal ID
	405	9(3)	Message Format Flag
	406	9(3)	Fraud Control Flag
	407	X(120)	Control String
	408	X(16)	Host Identifying Prompt
	409	9(4)	Floor Limit
	410	X(120)	Response Analysis Control String
	411	X(120)	Auxiliary Control String
	412	9(1)	Multi Trans Group
	413	X(120)	General Location 413
	|		
	499	X(120)	General Location 499
HOST 5	500	X(20)	Primary Phone Number
	501	X(20)	Secondary Phone Number
	502	X(16)	Call Center phone number
	503	X(16)	Referral Phone Number
	504	X(46)	Terminal ID
	505	9(3)	Message Format Flag
	506	9(3)	Fraud Control Flag
	507	X(120)	Control String
	508	X(16)	Host Identifying Prompt
	509	9(4)	Floor Limit
	510	X(120)	Response Analysis Control String
	511	X(120)	Auxiliary Control String
	512	9(1)	Multi Trans Group
	513	X(120)	General Location 513
	|		
	599	X(120)	General Location 599

	Location	Info Type/ Length	Description
HOST 6	600	X(20)	Primary Phone Number
	601	X(20)	Secondary Phone Number
	602	X(16)	Call Center phone number
	603	X(16)	Referral Phone Number
	604	X(46)	Terminal ID
	605	9(3)	Message Format Flag
	606	9(3)	Fraud Control Flag
	607	X(120)	Control String
	608	X(16)	Host Identifying Prompt
	609	9(4)	Floor Limit
	610	X(120)	Response Analysis Control String
	611	X(120)	Auxiliary Control String
	612	9(1)	Multi Trans Group
	613	X(120)	General Location 613
	|		
	699	X(120)	General Location 699
HOST 7	700	X(20)	Primary Phone Number
	701	X(20)	Secondary Phone Number
	702	X(16)	Call Center phone number
	703	X(16)	Referral Phone Number
	704	X(46)	Terminal ID
	705	9(3)	Message Format Flag
	706	9(3)	Fraud Control Flag
	707	X(120)	Control String
	708	X(16)	Host Identifying Prompt
	709	9(4)	Floor Limit
	710	X(120)	Response Analysis Control String
	711	X(120)	Auxiliary Control String
	712	9(1)	Multi Trans Group
	713	X(120)	General Location 713
	|		
	799	X(120)	General Location 799

	Loction	Info Type/ Length	Description
HOST 8	800	X(20)	Primary Phone Number
	801	X(20)	Secondary Phone Number
	802	X(16)	Call Center phone number
	803	X(16)	Referral Phone Number
	804	X(46)	Terminal ID
	805	9(3)	Message Format Flag
	806	9(3)	Fraud Control Flag
	807	X(120)	Control String
	808	X(16)	Host Identifying Prompt
	809	9(4)	Floor Limit
	810	X(120)	Response Analysis Control String
	811	X(120)	Auxiliary Control String
	812	9(1)	Multi Trans Group
	813	X(120)	General Location 813
	|		
	899	X(120)	General Location 899
HOST 9	900	X(20)	Primary Phone Number
	901	X(20)	Secondary Phone Number
	902	X(16)	Call Center phone number
	903	X(16)	Referral phone number
	904	X(46)	Terminal ID
	905	9(3)	Message Format Flag
	906	9(3)	Fraud Control Flag
	907	X(120)	Control String
	908	X(16)	Host Identifying Prompt
	909	9(4)	Floor Limit
	910	X(120)	Response Analysis Control String
	911	X(120)	Auxiliary Control String
	912	9(1)	Multi Trans Group
	913	X(120)	General Location 913
	|		
	949	X(120)	General Location 949
	950	9(1)	Printer Type 0 = no printer

	Location	Info Type/ Length	Description
	950 (cont'd.)		1 = generic roll 2 = Zon Printer 200 (Citizen printer) 3 = Zon Printer 100 (VFI Slip printer) 4 = NCR Slip printer (not implemented)
	951	9(3)	Number of LFs to eject a slip (Citizen only) default = 6
	952	9(3)	Baud for Generic Roll Printer 0 = 300 1 = 600 2 = 1200 3 = 2400 4 = 4800 5 = 9600 6 = 19200 <empty> and out of rnage defaults to 300
	953	9(1)	Generic Roll Printer Data Format 0 = 7 data, even parity, 2 stop 1 = 8 data, no parity, 2 stop <empty> and out of range defaults to 7E2
	954	9(1)	Handshake for Generic Roll Printer 0 = hardware 1 = none <empty> and out of range defaults to hardware
	955 | 957	X(60)	Reserved
	958	9(1)	Bell/CCITT (CCITT units only) 0 = <empty> = Bell 1 = CCITT
	959	X(60)	Reserved
	960	9(1)	Dialup up/download speed 0 = 300 1 = 300 2 = 1200 3 = 1200/300
CCITT Units:	961	X(60)	Silence
	962	X(60)	Dial Tone
	963	X(60)	Busy
	964	X(60)	Ringback

	Location	Info Type/ Length	Description
Other Units:	961 |		
	964	X(60)	Reserved
	965	9(1)	Auto Answer Speed 1 = 300 2 = 1200 (212 models only)
	966	9(1)	Auto Answer Processing 0 = go off hook, wait 2 seconds, raise answer carrier, wait for originate carrier 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 |		
	969	X(60)	Reserved
	970	9(1)	DIN 6 peripheral N0, Y = nothing 1 = bar code wand 2 = PINpad device 3 = general communication device
	971	9(3)	Extended redial flag (3.40+)
	972 |		
	974	X(60)	Reserved
	975	9(1)	Line Recovery Time 0 or <empty> = 3 seconds
	976	X(60)	Reserved
	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
	978	X(60)	Reserved

Appendix B. TRANZ 330 Memory Map

Location	Info Type/ Length	Description
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 I 989	X(60)	Reserved
990	X(120)	Communication Error Control String 1 = Lost carrier 2 = no ENQ from host 3 = no response form host 4 = exceeded number of allowable timeouts 5 = unexpected EOT 6 = bad RX communication 7 = bad TX communication
991 I 996	X(60)	Reserved
997	X(120)	VeriFone Control String
998	X(60)	Reserved
999	X(60)	Program Error Recovery Log

Appendix C. TRANZ 380 Memory Map

Following is the memory map for the TRANZ 380 terminal. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alphanumeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

TRANZ 380 Memory Map

Location	Info Type/ 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(120)	General Record
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

Location	Info Type/ Length	Description
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		
|		
0099	X(120)	General Records 0040 to 0099
0100	X(32)	Primary Phone Number
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)	Response Analysis Control String
0111	X(120)	Auxiliary Control String
0112	9(1)	Multi-Transaction Group Code
0113		
|		
0199	X(120)	General Records 0113 to 0199
0200	X(32)	Primary Phone Number

Appendix C. TRANZ 380 Memory Map

Location	Info Type/ Length	Description
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)	Response Analysis Control String
0211	X(120)	Auxiliary Control String
0212	9(1)	Multi-Transaction Group Code
0213		
|		
0299	X(120)	General Records 0213 to 0299
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)	Response Analysis Control String
0311	X(120)	Auxiliary Control String
0312	9(1)	Multi-Transaction Group Code
0313		
|		
0399	X(120)	General Records 0319 to 0399
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
0404	X(46)	Merchant/Terminal ID

Location	Info Type/ Length	Description
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)	Response Analysis Control String
0411	X(120)	Auxiliary Control String
0412	9(1)	Multi-Transaction Group Code
0413		
|		
0499	X(120)	General Records 0413 to 0499
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)	Response Analysis Control String
0511	X(120)	Auxiliary Control String
0512	9(1)	Multi-Transaction Group Code
0513		
|		
0599	X(120)	General Records 0513 to 0599
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

Location	Info Type/ Length	Description
0609	9(4)	Floor Limit
0610	X(120)	Response Analysis Control String
0611	X(120)	Auxiliary Control String
0612	9(1)	Multi-Transaction Group Code
0613		
|		
0699	X(120)	General Records 0613 to 0699
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
0708	X(16)	Transaction Type Prompt
0709	9(4)	Floor Limit
0710	X(120)	Response Analysis Control String
0711	X(120)	Auxiliary Control String
0712	9(1)	Multi-Transaction Group Code
0713		
|		
0799	X(120)	General Records 0713 to 0799
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)	Response Analysis Control String
0811	X(120)	Auxiliary Control String
0812	9(1)	Multi-Transaction Group Code

Location	Info Type/ Length	Description
0813		
|		
0899	X(120)	General Records 0813 to 0899
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)	Response Analysis Control String
0911	X(120)	Auxiliary Control String
0912	9(1)	Multi-Transaction Group Code
0913		
|		
0949	X(120)	General Records 0913 to 0949
0950	X(60)	Printer Type Flag
0951	X(60)	Number of 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		
|		
0957	X(120)	Reserved
0958	X(60)	Bell/CCITT Mode
0959	X(60)	Reserved
0960	X(60)	Dial-up Line Upload/Download Speed
0961		
|		
0964	X(120)	Reserved
0965	X(60)	Auto Answer Speed
0966	9(1)	Auto Answer Processing
0967	9(1)	Auto Answer Packet Inactivity Timeout

Location	Info Type/ Length	Description
0968		
|		
0969	X(120)	Reserved
0970	X(60)	DIN 6 Peripheral
0971		
|		
0974	X(120)	Reserved
0975	X(60)	Line Recovery Time
0976	X(60)	Reserved
0977	9(1)	Free Memory Reclamation Parameter
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 Number For Card Initiated Trans
0986	9(1)	Host Number For Bar Code Initiated Trans
0987		
|		
0989	X(120)	Reserved
0990	X(120)	Communication Error Control String
0991		
|		
0996	X(120)	Reserved
0997	X(120)	VeriFone Control String
0998	X(120)	Reserved
0999	X(60)	Programming Error Recovery Log
1000		
|		
1049	X(120)	Reserved
1050		
|		
1999	X(120)	General Records 1050 to 1999

Appendix D. TRANZ 420 Memory Map

Following is the memory map for the TRANZ 420 terminal. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alpha-numeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

TRANZ 420 Memory Map

Location	Info Type/ Length	Description
000	X(32)	Download Phone Number
001	X(10)	Serial/ID Number/Terminal (TTID)
002	--	Transmit Buffer
003	--	Receive Buffer
004	9(6)	Program Date
005	9(4)	Message Sequence Number
006	9(2)	Number of Characters to Scroll
007	9(1)	Multiple Transaction Timeout
008	9(5)	Not used
009	9(1)	Key Beep
010	9(1)	Dial Type Flag
011	9(1)	Dial Speed Flag
012	9(1)	Parallel Phone Available Flag
013	9(1)	Number of Attempts
014	9(1)	Line Test
015	9(3)	Number of Seconds to Wait Before Answering Call
016	X(120)	General Record
017	9(1)	Recall, Clock, U-to-U Restriction
018	9(?)	Reserved
019	X(7)	Application Identification (TAID)
020 | 029	X(60)	Reserved
030	X(20)	Idle Prompt

Location	Info Type/ Length	Description
031	X(120)	Function Key Control String #1
032	X(120)	Function Key Control String #2
033	X(120)	Function Key Control String #3
034	X(120)	Function Key Control String #4
035	X(120)	Function Key Control String #5
036	X(120)	Function Key Control String #6
037	X(120)	Out of Memory Control String
038	X(120)	Auto Answer Control String
039	X(120)	Function Key Control String #9
040		
|		
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(120)	Transaction Type Prompt
109	X(4)	Floor Limit
110	X(120)	Response Analysis Control String
111	X(120)	Auxiliary Control String
112	X(1)	Multi-Transaction Group Code
113		
|		
199	X(120)	General Locations 113 to 199
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

Appendix D. TRANZ 420 Memory Map

Location	Info Type/ Length	Description
207	X(120)	Transaction Control String
208	X(20)	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 | 299	X(120)	General Locations 213-299
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(20)	Transaction Type Prompt
309	9(4)	Floor Limit
310	X(120)	Response Analysis Control String
311	X(120)	Auxiliary Control String
312	9(1)	Multi-Transaction Group Code
313 | 399	X(120)	General Locations 313 to 399
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(20)	Transaction Type Prompt
409	9(4)	Floor Limit

Location	Info Type/ Length	Description
410	X(120)	Response Analysis Control String
411	X(120)	Auxiliary Control String
412	9(1)	Multi-Transaction Group Code
413		
|		
499	X(120)	General Locations 413 to 499
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(20)	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		
|		
599	X(120)	General Locations 513 to 599
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(20)	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

Appendix D. TRANZ 420 Memory Map

Location	Info Type/ Length	Description
613		
|		
699	X(120)	General Locations 613 to 699
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(20)	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		
|		
799	X(120)	General Locations 713 to 799
800	X(32)	Primary Phone Number
801	X(32)	Secondary Phone Number
802	X(32)	Call Center Phone Numer
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(20)	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		
|		
899	X(120)	General Locations 813-899

Location	Info Type/ Length	Description
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(20)	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 | 949	X(120)	General Locations 913-949
950	X(120)	Reserved
951	X(120)	Number of LFs to Eject Paper
952 | 957	X(120)	Reserved
958	X(120)	Bell/CCITT
959	X(120)	Reserved
960	X(120)	Dialup Up/Down Load Speed
961 | 964	X(120)	Reserved
965	9(1)	Auto Answer Speed
966	X(1)	Auto Answer Processing
967	9(1)	Auto Answer Packet Inactivity Timeout
968 | 969	X(120)	Reserved
970	X(120)	DIN 6 Peripheral
971 | 974	X(120)	Reserved

Location	Info Type/ Length	Description
975	9(3)	Line Recovery Time in Seconds
976	X(120)	Reserved
977	X(120)	Mem Mgr Garbage Collection Parameter
978	X(120)	Reserved
979	X(120)	Abort Control String
980	9(3)	Delay Before Executing Idle Loop Control String in Seconds
981	X(120)	Idle Loop Control String
982	9(120)	Idle Loop Phone Number
983	X(120)	Idle Loop Response Control String
984	9(1)	Multi-trans Enable
985	9(1)	Host No. for Cardreader-Initiated Tran
986	9(1)	Host No. for Bar Code-Initiated Tran
987	X(120)	Reserved
988	X(120)	RAM Cartridge Changed Control String
989	X(120)	RAM Cartridge Download Control String
990	X(120)	Communication Error Control String
991	X(120)	Reserved
992	X(10)	Terminal's RAM Cartridge ID (TCID)
993	X(120)	Reserved
994	X(120)	Sleep Mode Timer
995 |		
996	X(120)	Reserved
997	X(120)	Diagnostic Control String
998	9(2)	Reserved

Appendix E. TRANZ 460 Memory Map

Following is the memory map for the TRANZ 460 terminal. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alpha-numeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

TRANZ 460 Memory Map

Location	Info Type/ Length	Description
0000	X(32)	Download Phone Number
0001	X(10)	Terminal ID
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)	Not used
0009	9(1)	Key Beep
0010	9(1)	Dial Type Flag
0011	9(1)	Dial Speed Flag
0012	9(1)	Upload Operation Flag
0013	9(1)	Number of Attempts
0014	9(1)	Line Test Flag
0015	9(3)	Number of Seconds to Wait Before Answering Call
0016	X(120)	General Record
0017	9(1)	Recall, Clock, Unit-to-Unit Restriction
0018	9(?)	Reserved
0019	X(7)	Application Identification (TAID)
0020 | 0029	X(60)	Reserved
0030	X(30)	Idle Prompt

Location	Info Type/ Length	Description
0031	X(120)	Function Key Control String #1
0032	X(120)	Function Key Control String #2
0033	X(120)	Function Key Control String #3
0034	X(120)	Function Key Control String #4
0035	X(120)	Function Key Control String #5
0036	X(120)	Function Key Control String #6
0037	X(120)	Out of Memory Control String
0038	X(120)	Auto Answer Control String
0039	X(120)	Function Key Control String #9
0040		
|		
0099	X(120)	General Records
0100	X(32)	Primary Phone Number
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(20)	Transaction Type Prompt
0109	X(4)	Floor Limit
0110	X(120)	Response Analysis Control String
0111	X(120)	Auxiliary Control String
0112	X(1)	Multi-Transaction Group Code
0113		
|		
0199	X(120)	General Locations 0113 to 0199
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

Appendix E. TRANZ 460 Memory Map

Location	Info Type/ Length	Description
0208	X(20)	Transaction Type Prompt
0209	9(4)	Floor Limit
0210	X(120)	Response Analysis Control String
0211	X(120)	Auxiliary Control String
0212	9(1)	Multi-Transaction Group Code
0213		
|		
0299	X(120)	General Locations 0213-0299
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(20)	Transaction Type Prompt
0309	9(4)	Floor Limit
0310	X(120)	Response Analysis Control String
0311	X(120)	Auxiliary Control String
0312	9(1)	Multi-Transaction Group Code
0313		
|		
0399	X(120)	General Locations 0313 to 0399
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
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(20)	Transaction Type Prompt
0409	9(4)	Floor Limit
0410	X(120)	Response Analysis Control String
0411	X(120)	Auxiliary Control String

Location	Info Type/ Length	Description
0412	9(1)	Multi-Transaction Group Code
0413		
|		
0499	X(120)	General Locations 0413 to 0499
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(20)	Transaction Type Prompt
0509	9(4)	Floor Limit
0510	X(120)	Response Analysis Control String
0511	X(120)	Auxiliary Control String
0512	9(1)	Multi-Transaction Group Code
0513		
|		
0599	X(120)	General Locations 0513 to 0599
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(20)	Transaction Type Prompt
0609	9(4)	Floor Limit
0610	X(120)	Response Analysis Control String
0611	X(120)	Auxiliary Control String
0612	9(1)	Multi-Transaction Group Code
0613		
|		
0699	X(120)	General Locations 0613 to 0699

Location	Info Type/ Length	Description
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
0708	X(20)	Transaction Type Prompt
0709	9(4)	Floor Limit
0710	X(120)	Response Analysis Control String
0711	X(120)	Auxiliary Control String
0712	9(1)	Multi-Transaction Group Code
0713 | 0799	X(120)	General Locations 0713 to 0799
0800	X(32)	Primary Phone Number
0801	X(32)	Secondary Phone Number
0802	X(32)	Call Center Phone Numer
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(20)	Transaction Type Prompt
0809	9(4)	Floor Limit
0810	X(120)	Response Analysis Control String
0811	X(120)	Auxiliary Control String
0812	9(1)	Multi-Transaction Group Code
0813 | 0899	X(120)	General Locations 0813-0899
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

Location	Info Type/ Length	Description
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(20)	Transaction Type Prompt
0909	9(4)	Floor Limit
0910	X(120)	Response Analysis Control String
0911	X(120)	Auxiliary Control String
0912	9(1)	Multi-Transaction Group Code
0913		
|		
0946	X(120)	General Locations 0913-0949
0947	9(1)	Terminal Power Up Flag
0948	X(120)	TCL RAM Checksum Exception List
0949	X(120)	ROM/TCL RAM Checksum
0950	X(120)	Reserved
0951	X(120)	Number of LFs to Eject Paper
0952		
|		
0957	X(120)	Reserved
0958	X(120)	Bell/CCITT
0959	X(120)	Reserved
0960	X(120)	Dialup Up/Down Load Speed
0961		
|		
0964	X(120)	Reserved
0965	9(1)	Auto Answer Speed
0966	X(1)	Auto Answer Processing
0967	9(1)	Auto Answer Packet Inactivity Timeout
0968		
|		
0969	X(120)	Reserved
0970	X(120)	DIN 6 Peripheral
0971		
|		
0974	X(120)	Reserved
0975	9(3)	Line Recovery Time in Seconds

Location	Info Type/ Length	Description
0976	X(120)	Reserved
0977	X(120)	Memory Manager Garbage Collection Parameter
0978	X(120)	Reserved
0979	X(120)	Abort Control String
0980	9(3)	Delay Before Executing Idle Loop Control String in Seconds
0981	X(120)	Idle Loop Control String
0982	9(120)	Idle Loop Phone Number
0983	X(120)	Idle Loop Response Control String
0984	9(1)	Multi-Trans Enable
0985	9(1)	Host Number for Cardreader-Initiated Transaction
0986	9(1)	Host Number for Bar-Code-Initiated Transaction
0987	X(120)	TCL-Initiated Zontalk Download Failed Control String
0988	X(120)	TCL-Initiated Zontalk Download Done Control String
0989	X(120)	General Record
0990	X(120)	Communication Error Control String
0991	X(120)	Transmit Level
0992	9(1)	Upload/Download/Zontalk Download Operation Flag
0993	9(1)	Upload Operation Flag
0994	9(1)	Permanent Phone Number Pointer
0995 | 0996	X(120)	Reserved
0997	X(120)	Diagnostic Control String
0998 | 1000	9(2)	Reserved
1001		Fast Connect Validation
1002		Ring Burst Minimum
1003		Required Spark Quencher
1004		Carrier Validation Time (Bell)

Location	Info Type/ Length	Description
1005		Dial Tone Detect Timeout
1006		Force "D" or "W" On in Dial String
1007		Delay Before First Redial
1008		Flash Hook Time
1009		Zero-Crossing Minimum Frequency to Detect
1010		Force Busy Detect
1011		Use Guard Tone
1012		V.21 Answer Carrier Validation
1013		V.22 Answer Carrier Validation In
1014		V.21 Originate Answer Tone Timeout
1015		V.22 Originate Answer Tone Timeout
1016		CCITT Answer Tone Timeout
1017		Required Calling Tone
1018		Resume TCL Operation on Powerup
1019		Power Up Control String
1020 | 1999		General Locations

Appendix F. TRANZ 470 Memory Map

Following is the memory map for the TRANZ 470 terminal. The memory map identifies the memory location address, the type of information that can be entered in the field (X = alpha-numeric; 9 = numeric), the length of the field, and a description of the data that may be entered in the field.

TRANZ 470 Memory Map

Location	Info Type/ Length	Description
0000	X(32)	Download Phone Number
0001	X(10)	Terminal ID
0002	—	Transmit Buffer
0003	—	Receive Buffer
0004	9(6)	Program Date
0005	9(4)	Dial Prefix
0006	9(2)	Number of Characters to Scroll
0007	9(1)	Inactivity Timeout
0008	9(5)	Not used
0009	9(1)	Key Beep Flag
0010	9(1)	Dial Type Flag
0011	9(1)	Dial Speed Flag
0012	9(1)	Parallel Phone Available Flag
0013	9(1)	Reserved
0014	9(1)	Line Test Flag
0015	9(3)	Number of Seconds to Wait Before Answering Call
0016	X(120)	Encrypted Master Key/Working Key Pointer
0017	9(7)	Extended Password Protection
0018	9(?)	Reserved
0019	X(7)	Application Identification (TAID)
0020 | 0029	X(60)	Reserved
0030	X(30)	Idle Prompt

Location	Info Type/ Length	Description
0031	X(120)	Function Key Control String #1
0032	X(120)	Function Key Control String #2
0033	X(120)	Function Key Control String #3
0034	X(120)	Function Key Control String #4
0035	X(120)	Function Key Control String #5
0036	X(120)	Function Key Control String #6
0037	X(120)	Reserved
0038	X(120)	Auto Answer Control String
0039	X(120)	Function Key Control String #9
0040 | 0099	X(120)	General Records
0100 | 0106	X(120)	General Locations
0107	X(120)	Transaction Control String
0108 | 0199	X(120)	General Locations
0200 | 0206	X(120)	General Records
0207	X(120)	Transaction Control String
0208 | 0299	X(120)	General Locations
0300 | 0306	X(120)	General Locations
0307	X(120)	Transaction Control String
0308 | 0399	X(120)	General Locations
0400 | 0406	X(120)	General Locations
0407	X(120)	Transaction Control String

Location	Info Type/ Length	Description
0408		
|		
0499	X(120)	General Locations
0500		
|		
0506	X(120)	General Locations
0507	X(120)	Transaction Control String
0508		
|		
0599	X(120)	General Locations
0600		
|		
0606	X(120)	General Locations
0607	X(120)	Transaction Control String
0608		
|		
0699	X(120)	General Locations
0700		
|		
0706	X(120)	General Locations
0707	X(120)	Transaction Control String
0708		
|		
0799	X(120)	General Locations
0800		
|		
0806	X(120)	General Locations
0807	X(120)	Transaction Control String
0808		
|		
0899	X(120)	General Locations
0900		
|		
0906	X(120)	General Locations
0907	X(120)	Transaction Control String
0908		
|		
0946	X(120)	General Locations
0947	9(1)	Terminal Power Up Flag
0948	X(120)	ROM/TCL RAM Checksum Exception List

Location	Info Type/ Length	Description
0949	X(120)	Storage of Checksums
0950	X(120)	Reserved
0951	X(120)	Number of LFs for External DIN-8 Printer
0952 | 0953	X(120)	Reserved
0954	9(120)	RTS Enable/Disable Flag
0955 | 0959	X(120)	Reserved
0960	X(120)	Dialup Up/Download Speed
0961	X(120)	Reserved
0962	X(120)	Dial Tone
0963	X(120)	Busy
0964	X(120)	Reserved
0965	9(1)	Auto Answer Speed
0966	X(1)	General Location
0967	9(1)	General Location
0968 | 0969	X(120)	Reserved
0970	X(120)	DIN 6 Peripheral
0971 | 0974		
0975	9(120)	General Location
0976	X(60)	Reserved
0977	X(120)	Memory Manager Free Space
0978	X(60)	Reserved
0979	X(120)	Abort Control String
0980	9(3)	Delay Before Executing Idle Loop Control String in Seconds
0981	X(120)	Idle Loop Control String
0982	X(120)	General Location
0983	X(120)	General Location
0984	X(120)	Reserved

Location	Info Type/ Length	Description
0985	9(1)	Host Number for Cardreader-Initiated Transaction
0986	9(1)	Host Number for Bar-Code-Initiated Transaction
0987 |	X(120) X(120)	
0989	X(120)	Reserved
0990	X(120)	General Location
0991	X(120)	Transmit Level 0 - 15 DB Attenation
0992	9(1)	Upload/Download/ZONTALK Download Operation Flag
0993	9(1)	Upload Operation Flag
0994	X(120)	Permanent Phone Number Pointer
0995	X(120)	Reserved
0996	X(1)	Skip Dial Tone Detection if <> 0
0997	X(120)	Diagnostic Control String
0998	X(120)	Reserved
0999	X(120)	Programming Error Recovery Log
1000	X(1)	Date and Time Transfer Flag

Note: See page F-6 for other options for the following locations.

1001	X(120)	Carrier Detect Debounce Time
1002		Ring Parameters
1003 |		
1017	X(120)	Reserved
1018	9(1)	Resume TCL Operation on Power-up
1019	X(120)	Power-up Control String
1020	9(1)	<>0 Enable TSCOPE Ver 1.0
1021 |		
1050	X(120)	Reserved for System
1051 |		
1999	X(120)	General Locations

Extended International Memory Locations

Location	Info Type/ Length	Description
1001	N	Fast Connect Validation
1002	N	Ring Burst Parameters
1003*	N	Spark Quencher
1004*	N	Carrier Validation Time/Detect Timeout
1005*	N	Dial Tone Detect Timeout
1006*	N	Force 'D' or 'W' on in Dial String
1007*	N	Redial Parameters
1008*	N	Flash Hook Time
1009*	N	Zero-Crossing Min/Max Frequency to Detect
1010*	N	Busy Detect Parameters
1011*	N	Guard Tone Parameters
1012*	N	V.21 Answer Carrier Validation/Detect Timeout
1013*	N	V.22 Answer Carrier Validation/Detect Timeout
1014*	N	V.21 Originate Answer Tone Timeout/ Carrier Detect Timeout
1015*	N	V.22 Originate Answer Tone Timeout/ Carrier Detect Timeout
1016*	N	CCITT Answer Tone/Carrier Detect Timeout
1017*	N	Calling Tone Parameters
1019		Power up Control String
1020	1	<> 0--> Enable Tscope Debugger

Notes

1) *In this Memory Map, "N" represents a multiple digit numeric field.*
2) *Locations followed by an asterisk (*) are not yet implemented.*
3) *See the TRANZ 470 Reference Manual for details.*

Appendix G. Link File Examples

Example 1 Following is an example of a link file that contains only one element in its link.

```
;    File Name: Demo.XL
;
;    Execution command line:
;
;         TCLOAD DEMO.XL -T
;
;    VISA 2nd generation application for XL
;    July 1986
;
;RAM version   (XL XE2AU220)
%XE2AU220
;Include files
;
@STARTUP.INC     ; startup/clear routine
```

Example 2 The following example is also a link file, but it includes a number of files in its link.

```
;    VISA 2nd generation application for XL
;    July 1986
;
;RAM version  (XL XE2AU220)
%XE2AU220
;Include  files
;
@DATA.INC                ; terminal data
@TKEYS.INC               ; transaction keys ctl strings
@XMIT.INC                ; bld transmit packet
@DCDETL.INC              ; bld dc detail
@RANGE.INC               ; account ranging
@ACCUM.INC               ; accumulator update
@PHONE.INC               ; host phone numbers file
@BATCH.INC               ; dc/batch settlement
@REVIEW.INC              ; review dc details
@VOID.INC                ; void dc transactions
```

```
@STARTUP.INC        ; startup/clear routine
@TOTDIS.INC         ; totals display/summary report
@TSTMEM.INC         ; test available memory
```

Appendix H. Sample TCL File

The following is an example of a TCL file created with WordStar®. This is an actual excerpt from the VISA second generation data capture application.

Example:

```
;    The file is named Startup.INC
;
;    Data Capture Batch Startup Routine
;
039$                ; Begining of Startup Task
;
    B5.5G
    A77             ; Check if batch request was made
    I7.1.49 ;
       P902         ; NO, print error msg
       K
       P190         ; prompt for PASSWORD?
       K7
       *L170        ; Clear batch
                    ; but do not update sequence number
P703                ; Display new batch begins message
L29; Now, cleanup status flags
;
                    ; if yes, then continue
    G
    *J1             ; LEFT JUSTIFY
    A133            ; Display last error code
    V
    G
    R48
    U132            ; reset RETRY counter
    L28             ; continue in mem loc 28
028$   ;beginning of startup task continued
    GA142           ; Now check if batch was transmitted
    I9.2.49         ; If not, skip and process error
GA133;CHECK LAST ERROR MESSAGE
I6.1.'Q'; IF Q THEN DELETE BATCH
    *L170           ; If yes, clear DC and ACC
```

```
    P703
    GR49
      T78          ; Increment sequence number
     *K1           ; Now abort this task.
    B5.5G          ; SELECT TEMP REG
    A139           ;  Display "UNSUCCFL TRNSMIT"
    V
    G
    L87            ; link to continue
;
;
087$
;
; if this is a Q response request for password and
;  delete batch
;
    A187           ; Display the 'Call VISA' msg
    *G1V           ; Ring the bell to signal error
    B5.5G          ; reset pointers and clear buffer
GA133;CHECK LAST ERROR MESSAGE
I6.2.'Q'; IF Q THEN DELETE BATCH

    *L170          ; PURGE BATCH
    P703
    GR49
    T78            ; Increment sequence number
    L29            ; EXIT
;
; ELSE
;
L148; MUST BE A 'R' CONTINUE

148$               ;batch settlement error processing
    G
    P144           ; Correct password, now prompt for
                   ; whether to continue DC or clear it
    K2.1           ; cont. batch?y/n
;
    I11.1.57       ; YES, THEN RESET INHIBIT FLAG AND EXIT
```

```
    I2.1.54          ; IF NO, THEN PURGE DC
    *G1              ; ERROR BEEP

    L                ; INCORRECT RESPONSE, ASK AGAIN
P190                 ; prompt for PASSWORD
    K7               ; accept pswd input and verify w/internal pswd
    *L170            ; PURGE BATCH
    P703
    GR49
    T78              ; Increment sequence number
    I1               ; EXIT
    P702             ; DISPLAY BATCH CONT
    L29              ; link to continue

029$
    GR'0'            ; move '0' into dest buffer
    U142             ; reset transmitted flag
    GR'00'
    U77              ; reset inhibit flag
    *K1
```

Appendix I. Error Messages

Following is a list of error messages that you may receive from TCLOAD during the course of development. The list is arranged in numerical order and includes the level of severity as well as a description of the error.

Error Code	Severity	Description
000	FATAL	"incorrect type or size of"
001	FATAL	"RAM heap space exhausted while trying to allocate"
002	FATAL	"could not find firmware description database file"
003	FATAL	"not a TCL firmware description database"
004	FATAL	"incompatible firmware description database, version"
005	WARN	"missing description in database of firmware version"
006	FATAL	"name of hints file was not supplied"
007	SEVERE	"name of database file not supplied, using default"
008	SEVERE	"command switch specified unsupported card type"
009	FATAL	"version directive must be first uncommented line"
010	SEVERE	"version ID not supplied, using ID in program text"
011	WARN	"version already identified"
012	WARN	"line truncated at 80 characters, location"
013	FATAL	"abrupt End-of-File encountered after"
014	WARN	"not a predefined string for this EPROM version"

Error Code	Severity	Description
015	FATAL	"'$' encountered before control string label"
016	FATAL	"':' not expected in this position"
017	FATAL	"'=' encountered before name of string"
018	FATAL	"string literal not expected in this position"
019	FATAL	"'(' not expected in this position"
020	FATAL	"')' not expected in this position"
021	SEVERE	"illegal character or word for string assignment"
022	SEVERE	"numeral not expected in this position"
023	SEVERE	"word not expected in this position"
024	SEVERE	"illegal character"
025	WARN	"equal sign was expected"
026	WARN	"dollar sign was expected"
027	SEVERE	"not a command name"
028	SEVERE	"expected a word, instead of"
029	SEVERE	"missing open parenthesis"
030	SEVERE	"missing required parameter"
031	SEVERE	"missing separating comma"
032	SEVERE	"missing closing parenthesis"
033	SEVERE	"missing closing bracket"
034	SEVERE	"string literal not terminated"
035	WARN	"character should not be escaped"
036	SEVERE	"missing closing single quote - truncated after"
037	SEVERE	"missing closing double quote - truncated after"
038	SEVERE	"word in double-quoted expression too tough to handle"
039	SEVERE	"missing matching keyword after "END""
040	SEVERE	"invalid specification for memory address forcing"
041	FATAL	"command found outside of control string"
042	SEVERE	"reserved word used as identifier"

Error Code	Severity	Description
043	SEVERE	"symbol defined twice"
044	WARN	"symbol had been declared as null string earlier"
045	SEVERE	"symbol defined or used inconsistently"
046	SEVERE	"symbol type/value changed between passes -- symbol"
047	SEVERE	"unidentified symbol found on second pass -- symbol"
048	SEVERE	"parameter value out of range"
049	SEVERE	"invalid negative value"
050	SEVERE	"unknown option name"
051	INFORM	"may use option names provided, instead of"
052	SEVERE	"invalid ASCII specification"
053	SEVERE	"need digit, not"
054	SEVERE	"need number, not"
055	SEVERE	"need single-digit value, not"
056	SEVERE	"need fixed prompt location, not"
057	SEVERE	"fixed prompt location out of range"
058	SEVERE	"need variable name, not"
059	SEVERE	"identifier not defined as VAR"
060	SEVERE	"variable needs to be of type VAR"
061	SEVERE	"must declare a name"
062	SEVERE	"bad value for variable assignment"
063	SEVERE	"location cannot be stored"
064	SEVERE	"location already loaded"
065	SEVERE	"ran out of two-digit location numbers on"
066	SEVERE	"could not shorten control string"
067	SEVERE	"too many characters in location"
068	FATAL	"no more memory locations available"
069	FATAL	"can't allocate the requested number of contiguous loc's"

Error Code	Severity	Description
070	FATAL	"requested location is not in pool of available locations"
071	INFORM	"forcing a system string to a specific address"
072	SEVERE	"disregarding illegal forcing of system string's address"
073	SEVERE	"8-bit location number unavailable for"
074	FATAL	"INTERNAL CONFUSION -- bad reference type on"
075	FATAL	"INTERNAL CONFUSION -- bad macro subscript word"
076	SEVERE	"INTERNAL CONFUSION -- unimplemented irregular parameter type for"
077	SEVERE	"INTERNAL CONFUSION -- undefined parameter type"
078	SEVERE	"INTERNAL CONFUSION -- unexpected character"
079	SEVERE	"INTERNAL CONFUSION -- can't push character, because of"
080	SEVERE	"INTERNAL CONFUSION -- severity has fallen below zero for"
081	SEVERE	"INTERNAL CONFUSION -- couldn't find link to remove it"
082	SEVERE	"INTERNAL CONFUSION -- couldn't find cross reference to remove it"
083	SEVERE	"not a specification of a memory location"
084	SEVERE	"need a reference to a variable, not"
085	WARN	"should use symbolic command labels, instead of"
086	FATAL	"unsupported communications port #"
087	SEVERE	"unable to configure COM port"
088	SEVERE	"serial port configuration error"
089	SEVERE	"serial output buffer overflow"
090	WARN	"terminal reporting invalid memory map"

Error Code	Severity	Description
091	FATAL	"direct download transmission error"
092	FATAL	"mismatch in EPROM version numbers"
093	FATAL	"application too large"
094	FATAL	"cannot open file"
095	FATAL	"cannot close file"
096	SEVERE	"invalid device driver file"
097	FATAL	"invalid option: -z not available with TRANZ 380"
098	FATAL	"invalid option: -d not available with TRANZ 380"

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