

Appendix D. TRANZ 330 (202) Leased Line Terminal

This appendix contains reference information specific to the Bell 202 leased line version of the TRANZ 330 transaction terminal.

Operation of the leased line TRANZ 330 is virtually identical to that of the dial up terminal with the exception of terminal communications. The dial up TRANZ 330 terminal communicates with a host computer via the public telephone network; the TRANZ 330 (202) leased line terminal connects to a private, dedicated telephone network.

Devices attached to a private telephone network are systematically polled by the network controller and must respond with either an acknowledgment of poll receipt or a packet of data that is to be transmitted to the host. The major difference between the TRANZ 330 (202) and dial up versions of the terminal is that the terminal does not go off-hook to dial the host computer telephone number in a leased line environment.

The TRANZ 330 (202) currently supports two versions of Tinet leased line communication protocols: single terminal, or standard Tinet, and multi-terminal, or cluster Tinet. Differences between these versions are outlined in this appendix.

Basic Operation

Basic operation of the TRANZ 330 (202) leased line terminal is essentially the same as that of the dial up version. However, since a private leased line telephone network is used, all operations related to dialing phone numbers are no longer available.

Specifically, all terminal memory locations assigned to telephone numbers or associated with the operation of the unit's telephone interface in the dial up version of the terminal are general or reserved locations in the TRANZ 330 (202) version. These locations include:

Memory

Location	Dial Up Description
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000	Download Phone Number
010	Dial Type Flag
011	Dial Speed Flag
012	Parallel Phone Available Flag
013	Number of Call Retries
014	Line Test Flag
015	Delay Before Auto Answer
020 - 029	Login String 0 - 9

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Memory

Location Dial Up Description

038	Auto Answer Control String
040 - 099	Memory Dialer Dial Strings
x00	Primary Phone Number
x01	Secondary Phone Number
x02	Call Center Phone Number
x03	Referral Phone Number
958	Bell/CCITT Select Flag
960	Dial-Up Line Download Speed
965	Auto Answer Speed
966	Auto Answer Processing Flag
967	Auto Answer Inactivity Timeout

Refer to the complete listing of TRANZ 330 (202) terminal memory locations on page D-7.

All TCL commands associated with the public telephone network or setting up the Bell or CCITT modems in dial up units, including the S, +D, +K, +M commands, and some options on several other commands, including the *K command, are unavailable. Refer to the TCL Programmer's Manual for availability of specific commands.

Entering Terminal Parameters

The TRANZ 330 terminal must be configured with the proper terminal specific parameters in memory locations 020, 021 and 960 to function properly on the leased line.

Poll Address

TRANZ 330 (202) Version: Standard and Cluster

Memory Location: 020

Character Type: Numeric

Field Length: Up to 3 characters

This parameter is the address assigned to the terminal or terminal cluster on the multi-drop leased line. Valid poll addresses are as follows:

Standard	Cluster
1	32 to 47
3	96 to 111
5 to 15	
32 to 47	
64 to 79	
96 to 111	

Keyboard (KBD) ID

TRANZ 330 (202) Version: Cluster

Memory Location: 021

Character Type: Numeric

Field Length: 1 character

Support for terminal clustering has been added as an enhancement to the cluster version of the TRANZ 330 (202). This feature enables up to 4 terminals to share a common poll address. The Keyboard ID parameter is

used by the network controller to distinguish between multiple terminals on the cluster.

The valid range for this parameter is from 0 (or <empty>) to 3 with the default being 0 (cluster "master").

Note: Only the master terminal on the cluster provides the "NO DATA" response to poll from the controller. A terminal's data response to poll is windowed at intervals of 50 milliseconds based on its keyboard ID. For proper operation of the cluster, it is imperative that there be only one master terminal (KBD ID = 0) and that there be no duplication of keyboard IDs anywhere in the cluster.

Poll Timeout Period TRANZ 330 (202) Version: Cluster

Memory Location: 960

Character Type: Numeric

Field Length: Up to 2 characters

If the terminal does not receive a poll from the network controller within a specified period of time, it displays the message NO POLLS RCVD, indicating that either the leased line is down or the network controller or the specific terminal affected is inoperative.

The timeout period in the cluster version of the leased line TRANZ 330 can be modified by the user via the keyboard "STORE" function by storing the desired poll timeout value in location 960. The range for this parameter is from 1 to 65 seconds with 0 or <EMPTY> specifying the default poll timeout.

The default "no poll" timeout is 45 seconds for both protocol versions of the terminal .

Downloading

The TRANZ 330 (202) supports both direct (terminal-to-terminal) and leased line downloads. Direct downloading of the leased line TRANZ is identical in function and procedure to the dial up version of the terminal as described in section 3, page 3-4 of this manual.

Due to existing capabilities of the specific host processors, the leased line download protocol employed by the two different versions of the TRANZ 330 (202) differ significantly and are not compatible. Download procedures differ for each version.

Tinet Standard Leased
Line Download

The standard leased line download provides both full and partial downloads. Under this protocol, a full download is defined as a download of a DIFFERENT version of the application than that currently in the terminal. A partial download is a redownload of the application currently in the terminal. Under both download procedures all terminal memory locations are reprogrammed with updated information from the host.

Use the following procedure to initiate a download on a terminal supporting Tinet standard.

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Display	Response
1. (idle prompt)	Press [FUNC/ENTER].
2. FUNCTION?	Press [0].
3. FULL/PART? F/P	Press [F] if you wish to perform a download of a different application version. Press [P] if you wish to perform a download of the current application.
4. VERSION NUMBER?	This prompt requests the input of the two digit version number of the application to be downloaded if a full download is being performed. This prompt is not displayed for partial downloads.
5. PROCESSING	Wait - the download is in progress.
6. DOWNLOAD DONE or DOWNLOAD FAILED	The terminal successfully completed the download. Press the [CLEAR] key to return to the idle prompt. The terminal was unable to complete the download. This could be due to a bad leased line or other problems not related to the terminal. Press [CLEAR] and try the download procedure again.

Tinet Cluster Leased Line Download

Tinet cluster leased line download currently supports only partial downloads in which RAM is not cleared prior to the download process. Memory locations change contents only if the host provides new information.

Use the following procedure to initiate a download on a terminal supporting Tinet clusters.

Display	Response
1. (idle prompt)	Press [FUNC/ENTER].
2. FUNCTION?	Press [0].
3. DOWNLOAD?	Press either [FUNC/ENTER] or [*] to start the application download process.
4. DOWNLOADING	Wait - the download is in progress.
5. DOWNLOAD DONE or DOWNLOAD FAILED	The terminal successfully completed the download. Press the [CLEAR] key to return to the idle prompt. The terminal was unable to complete the download. This could be due to a bad leased line or other problems not related to the terminal. Press [CLEAR] and try the download procedure again.

Host Initiated or Forced Downloads

The Cluster TRANZ 330 (202) also supports host initiated or forced downloads in which the terminal receives a command from the network controller that instructs it to begin the download process automatically. If the terminal is in the idle state when this command is received, it will automatically begin the download process beginning with step 4. If the terminal is not in the idle state, for example, if it is running a local function, the download will begin with step 4 as soon as the terminal returns to the idle state.

Maintenance/Diagnostics

Enhanced diagnostic capability has been added to the cluster version of the TRANZ 330 (202) to assist in troubleshooting problems specific to leased line terminals. Refer to page 5-9 for instructions on placing the terminal in the Diagnostics Mode. The following diagnostic options are available in cluster TRANZ 330 (202) terminals:

Key	Function
[5]	Initialize NAK Counter
[6]	Display NAK Counter
[9]	Tx/Rx Status Display
[*]	Leased Line Integrity Test

NAK Counter

The NAK Counter allows you to determine the terminal's capability to conduct error free communications with the network controller by tabulating the number of NAKs that are either transmitted or received during the processing of normal transactions.

Press [5] to initialize the NAK counter from the Diagnostic Mode. The message NAK COUNT INIT will be displayed for two seconds indicating that the NAK counter has been successfully initialized to zero. The terminal then returns to the DIAGNOSTIC prompt.

Enter the Diagnostics Mode and press [6] to determine how many NAKs occurred after running several transactions on the leased line. The terminal will display NAK COUNT = xx where xx is the number of NAKs that were either transmitted or received since the NAK counter was initialized. After 2 seconds the unit returns to the DIAGNOSTICS display.

Note: The NAK counter is a one byte value and can count the number of NAKs up to 255 without cycling through 0 again.

Tx/Rx Status Display

Enter the Diagnostics Mode and press [9] to enable the Tx/Rx status display. While in this mode, a message "TX ON" will indicate that the unit is responding to poll. The message "TX OFF" shows that the terminal's Bell 202 modem is in receive mode. Press any key to return to the "DIAGNOSTICS" display.

Note: Since the master terminal in a terminal cluster is the only device which provides the "no data" response to poll, only a master terminal will show the "TX ON" message.

Leased Line Integrity Test

Press [*] from the DIAGNOSTICS display to initiate the Leased Line Integrity Test. The message "TESTING LINE" will be displayed for 5 seconds. During this period, the number of data reception errors (parity errors, data overruns, etc.) will be recorded. Following this 5 second test, either a "LINE

OK" message indicating that no data receive exceptions occurred, or the message "ERROR CNT = xx" where xx is the number of errors that occurred in the testing interval will be displayed.

After a two second delay, the terminal will return to the Diagnostics Mode.

Programming Considerations

Very little modification should be necessary to download an application from a dial up TRANZ 330 to either version of the leased line terminal other than proper configuration of the terminal itself. This task, however, will be more difficult and time consuming for applications that make extensive use of the special TCL commands associated with the telephone or Bell 103/212 modem interface .

Standard TRANZ 330 (202)

When writing an application (or converting an existing one) for execution on the standard TRANZ 330 (202), you should be aware of the following differences from dial up terminal operation:

1. The terminal prohibits execution of host transactions when it is in the NO POLLS RCVD condition.
2. The initiation of a host transaction does not begin with a <STX> in the transmit buffer. The transmit buffer is completely cleared when a transaction begins.
3. The data packet received from communications with the host and returned to the application level is stripped of its packet header (<STX>) and trailer (<ETX><LRC>).

Cluster TRANZ 330 (202)

When writing an application (or converting an existing one) for execution on the cluster TRANZ 330 (202), you should be aware of the following differences from dial up terminal operation:

1. The terminal prohibits execution of host transactions when it is in the NO POLLS RCVD condition.
2. The initiation of a host transaction does not begin with a <STX> in the transmit buffer. Instead, the transmit buffer is completely cleared when a transaction begins.
3. The data packet received from communications with the host and returned to the application level is the complete packet received including its packet header (<STX>) and trailer (<ETX><LRC>).

Protocol Consideration

The data transmitted from the terminal to the host under the Tinet protocol has the following format:

<STX><KBD><TC><SEQ>....data....<ETX><LRC>

where <STX> = Start of Text (02 hex)
 <KBD> = Keyboard ID
 <TC> = Tran code
 <SEQ> = Sequence Number
 <ETX> = End of text (03 hex)

For both versions of the TRANZ 330 (202) the <STX>, <ETX>, and <LRC> characters are provided by the operating system and these characters should not be present in the application transmit buffer when it is passed along to the EPROM communication routine.

The data transmitted from the host to the terminal is formatted as follows:

<STX><KBD><SEQ>....data....<ETX><LRC>

Standard TRANZ 330 (202)

Although the operating system automatically provides the appropriate transaction sequence number and a constant value of 40 Hex for the keyboard ID (KBD), space within the transmit packet must be reserved for these values at the application level. Also, in the Standard version, the tran code must be provided by the application. Therefore, the application transmit buffer should be of the following form for proper communication to occur:

<X><TC><X>....data....

where <X> is any single character.

For the Standard TRANZ 330 (202), the <STX>, <ETX>, and <LRC> characters are stripped from the data when it is received into the application level receive buffer.

Cluster TRANZ 330 (202)

The only data required to be in the application transmit buffer prior to communication is the data portion of the packet. The keyboard ID (KBD as defined by location 021), a constant tran code of 30 hex, and the transaction sequence number, are automatically inserted into the transmit packet by the operating system.

For data received from the host, all data received is available at the application level including the <STX>, <ETX>, and <LRC>.

Error Messages

The following error messages are either specific to the TRANZ 330 (202) terminals or have meanings other than those already documented in Appendix C.

PROCESSING	Indicates that the communications dialog has begun.
BAD TX COMM	Indicates that the transmit timeout elapsed during the transmit portion of the communications dialog or that the host responded to the message with an ENQ or some unrecognized character.
BAD RX COMM	A problem occurred during the receive portion of the communications dialog. This means that three packets with invalid LRCs were received and NAKed by the terminal.
NO RESP FRM HOST	The receive or transmit timeout elapsed without a data packet being properly transmitted or received.
REMOTE LOOPBACK	(Standard only) The communications dialog was interrupted by a Remote Loopback request message from the host.
INVALID POLL ID	The poll address in memory location 020 is invalid.
INVALID KBD ID	(Cluster only) The keyboard ID in memory location 021 is invalid.
NO POLLS RCVD	The poll timeout period has expired without receiving a network poll or select. Default = 45 seconds. User settable for cluster version (location 960).

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Memory Locations

In addition to memory location numbers and descriptions, this numeric listing also includes character type and field lengths for the TRANZ 330 (202) memory locations.

The field length indicates the maximum number of characters that can be stored in the memory location.

Memory Location	Character Type*	Field Length	Description
000	X	20	General Location
001	X	10	Serial Number
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	Reserved
009	9	1	Beeper On/Off
010	9	1	Reserved
011	9	1	Reserved
012	9	1	Reserved
013	9	1	Reserved
014	9	1	Reserved
015	9	3	Reserved
016	X	120	Encrypted Working/Master Key Pointer
017	9	1	RECALL, Clock, Unit-to-Unit Restriction
018	9	16	Error Statistics
019	X	7	Application Identification
020	9	3	Poll Address
021	9	1	Keyboard ID (cluster only)
022 - 029	X	60	General Locations 22 to 29
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	General Location
039	X	120	Function Key # 9 Control String
040 - 099	X	120	General Locations 40 to 99
100	X	20	General Location
101	X	20	General Location

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
102	X	16	General Location
103	X	16	General Location
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
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113 - 199	X	120	General Locations 113 to 199
<hr/>			
200	X	20	General Location
201	X	20	General Location
202	X	16	General Location
203	X	16	General Location
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
<hr/>			
213 - 299	X	120	General Locations 213 to 299
<hr/>			
300	X	20	General Location
301	X	20	General Location
302	X	16	General Location
303	X	16	General Location
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
311	X	120	Auxiliary Control STring
312	9	1	Multi-Transaction Group Code
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313 - 399	X	120	General Locations 313 to 399
<hr/>			
400	X	20	General Location

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
401	X	20	General Location
402	X	16	General Location
403	X	16	General Location
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
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413 - 499	X	120	General Locations 413 to 499
<hr/>			
500	X	20	General Location
501	X	20	General Location
502	X	16	General Location
503	X	16	General Location
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 - 599	X	120	General Locations 513 to 599
600	X	20	General Location
601	X	20	General Location
602	X	16	General Location
603	X	16	General Location
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
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613 - 699	X	120	General Locations 613 to 699

*X = alphanumeric; 9 = numeric

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Memory Location	Character Type*	Field Length	Description
700	X	20	General Location
701	X	20	General Location
702	X	16	General Location
703	X	16	General Location
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
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713 - 799	X	120	General Locations 713 to 799
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800	X	20	General Location
801	X	20	General Location
802	X	16	General Location
803	X	16	General Location
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 - 899	X	120	General Locations 813 to 899
900	X	20	General Location
901	X	20	General Location
902	X	16	General Location
903	X	16	General Location
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
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913 - 949	X	120	General Locations 913 to 949

*X = alphanumeric; 9 = numeric

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Memory Location	Type*	Length	Description
950	9	1	Printer Type Flag 0 = No Printer 1 = Generic Roll Printer 2 = Printer 200 (Citizen) 3 = Printer 100 (Slip Printer)
951	9	3	Number of Line Feeds for P200 6=default
952	9	1	Baud Rate for Generic Printer 0 = 300 (Default) 1 = 600 2 = 1200 3 = 2400 4 = 4800 5 = 9600 6 = 19200
953	9	1	Data Format - Generic Printer 0 = 7 data, even parity, 2 stop 1 = 8 data, no parity, 2 stop
954	9	1	Handshake - Generic Roll Printer 0 = Hardware (Default) 1 = None
955 - 959	X	60	Reserved
960	9	3	Poll Time Out Value (cluster only) 1..255 Seconds Default = 45 Seconds
961 - 969	X	120	Reserved
970	9	1	DIN 6 Peripheral 0 or <empty> = Nothing Connected 1 = Bar Code Wand, 2 = PIN Pad 3 = General Communication Device
<i>Warning: If you select "2" to indicate a PIN Pad connection and a PIN Pad is not attached, there will be a delay when you press [CLEAR] because the terminal will still attempt to reset the PIN Pad three times before resuming normal processing.</i>			
971 - 979	X	60	Reserved
980	X	120	Delay Executing Idle Loop CS 0 or <empty> = Disabled
981	X	120	Idle Loop Control String
982	X	60	Reserved

*X = alphanumeric; 9 = numeric

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Memory Location	Type*	Length	Description
983	X	120	Idle Loop Response Analysis CS
984	X	60	Idle Loop Inactivity Timeout
985	9	1	Host # for Card Initiated Trans
986	9	1	Host # for Bar Code Init. Trans
987 - 989	X	60	Reserved
990	X	120	Commun Error Control String
991 - 996	X	60	Reserved
997	X	120	VFI Diagnostic Control String
998	X	60	Reserved
999	X	60	Programming Error Recovery Log

*X = alphanumeric; 9 = numeric

