MICRO-TERM, INC.

ERGO 201

OPERATING MANUAL

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CONTENTS

1. INTRODUCTION

1.1 Product Description

The ERGO 201 is a fully featured block mode terminal which is code compatible with the following terminals:

> Micro-Term ACT-5A
> Lear-Sieglar ADM 3A*
> DEC VT52*
> Televideo 925*

Features of the ERGO 201 include:

1. ERGONOMIC DESIGN - High resolution video monitor with green phosphor for a crisp display without eye fatigue. The advanced mechanical design gives full freedom for positioning and viewing-angle adjustment: the display unit tilts to suit any operator situation.

2. DETACHED KEYBOARD - The detached low-profile keyboard with integral palm rest provides greater operator convenience and work station layout flexibility. An accounting-style key pad facilitates numeric data entry. Seven lamps located on the keyboard indicate terminal status.

3. CUSTOM MODE - Custom Mode allows the operator to define the ERGO 201's response to Control Codes and Escape Sequences, which gives the ERGO 201 the capability to emulate many other terminals. Custom Mode Control Code and Escape Sequence definitions may be down loaded from the host computer and may be saved from one operating session to the next in a non-volatile memory (EAROM).

4. 16 FUNCTION KEYS - The operator may program the code sequences transmitted by the ERGO 201's function keys (when depressed simultaneously with the CTRL key) up to a maximum of 16 characters per key and may save the key definitions in non-volatile memory. Additionally, the SHIFTED and UNSHIFTED function keys default to standard sequences which may be redefined (downloaded) from the host. Thus, the ERGO 201's 16 function keys are equivalent to 48 programmable function keys!

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* ADM 3A is a Reg. TM of Lear Siegler, Inc. DEC and VT52 are Reg. TM of Digital Equipment Corp. 925 is a Reg. TM of Televideo, Inc.

5. PLAIN ENGLISH SET-UPS - SET-UP mode switches are defined in English to allow the operator to modify the operational characteristics of the terminal without constant reference to manuals. SET-UP characteristics and programmable function key definitions may be saved from one operating session to the next in a non-volatile memory (EAROM) and are retained even if the terminal is powered down.

6. 25TH LINE - The ERGO 201's 25th line may be used to display user messages or a variety of status and diagnostic reports which are SET-UP switch selectable.

7. LOCAL EDITING - Full LOCAL editing capabilities include: insert/delete line(s) insert/delete character(s), insertion mode, erase line, erase screen, and erase field.

8. PRINTER PORT - The ERGO 201's printer port is bidirectional for complete print capability.

9. ENLARGED BUFFER - 256 character buffer eliminates the possibility of losing data and reduces host overhead.

10. VIDEO ATTRIBUTES - Five video attributes on a character-by-character basis include: reverse video, blinking, underline, half intensity and blank.

11. SCREEN SAVER - The SCREEN SAVER feature (if enabled) blanks the display after approximately 9 minutes if no data is received from the host or the keyboard to extend monitor life. Reception of data from the host or depression of any key restores the display without change.

12. TRANSPARENCY MODE - Transparency Mode displays control codes to aid in data formating and troubleshooting.

13. SELF-TEST - Self-Test upon power-up for complete confidence.

1.1.1 Options

- Amber Phosphor

- Second Page of Screen Memory

- Alternate Character Sets

- Plot 10, and ReGIS Graphics Packages

- Current Loop

1.2 Using the ERGO 201 Operating Manual

This manual is divided into six major sections providing:

1 Introduction.

2. Operator Information.

3. Programmer Information.

4. Function Definitions and emulation/mode implications

5. Interface Information.

6. Appendices.

Although operators will find the ERGO 201 as easy to use as a typewriter, familiarity with Section 2 allows the operator access to numerous selectable features designed to maximize personal comfort. To obtain full performance of the ERGO 201, the programmer should be thoroughly familiar with Sections 2,3, and 4. Knowledge of the many ERGO 201 features enables the programmer to efficiently generate an effective display for any application.

1.3 Installation

The ERGO 201 should be positioned on a steady surface and at a comfortable level for the user. Care must be taken that magazines or other material do not fall behind the terminal and impede ventilation. The line cord must be connected to a three conductor grounded AC source of the proper voltage. An environment which is comfortable to the user will generally be acceptable for the use and storage of the ERGO 201. Extremes of temperature and humidity must be avoided.

Connect the ERGO 201 to the host using a 25 pin communications connector, and verify the pin connections in Appendix 5.0.2. Turn on the power switch at the front of the ERGO 201. The ERGO 201 will perform the power up self tests and beep when ready. After a one minute warm up period for the display, the cursor should appear in the upper left position of an otherwise clear screen. The cursor is the marker which indicates the position on the screen for the next character to be displayed. If any other display appears, refer to Section 5.1. Turn to Section 2 and select the set up features appropriate to your particular application.

1.4 Maintenance

External surfaces should be kept clean with the use of a mild soap or detergent solution on a damp cloth. Organic solvents must not be used. No other forms of preventive maintenance need be performed.

2. OPERATOR INFORMATION

2.1 Acoustic Indicators

Keyboard click is produced electronically and may be turned off or on at the discretion of the operator in SET-UP mode B. When enabled, the click will be generated for each key depression which causes a code to be transmitted. Two short "beeps" are sounded when the ERGO 201 is first turned on and the power up self test is completed. A "beep-beep" is also sounded in response to the bell code from the host, and whenever the operator types past column 72 when the margin bell feature has been enabled.

A series of ten beeps upon power up, or when a recall (Section 2.5.8) operation has been initiated, signifies that an internal error has occurred while attempting to recall the SET-UP features as they were last saved. If this condition should occur, the operator must correct the SET-UP features and perform a save operation. See Section 2.5.7.

Bell and key click volume may be adjusted by means of a potentiometer inside the keyboard housing.

2.2 Lamp Indicators

There are 7 lamp indicators on the 201 keyboard. When illuminated, the status suggested by the label is asserted.

ON LINE- Data from the host is processed. Characters from the keyboard are sent to the host if the BLOCK MODE lamp is off or stored locally and transmitted by a SEND operation if BLOCK mode is asserted.

LOCAL- Data from the host is ignored. Characters from the keyboard are processed as if they had been received from the host. The ON LINE and LOCAL lamps will alternately flash if XON-XOFF protocol is selected and the user sends XOFF to the host, thereby suspending communication from the host. The flashing reminds the user to send XON to resume communication from the host.

KEYBOARD LOCKED- Keyboard characters will not be processed (except SET-UP). The keyboard becomes locked if so commanded by the host or if the 201 is prevented from transmitting characters as fast as they become available and the internal keyboard buffer (8 characters) and transmission FIFO (64 characters) become full. The keyboard may be appropriately unlocked by the proper command from the host or when the internal buffers empty. The user may absolutely unlock the keyboard and empty the keyboard buffer by entering and exiting SET-UP mode.

BLOCK MODE- Characters from the keyboard go directly to the local display for later transmission to the host.

PRINTER PORT- One of the 6 print commands or modes has been asserted.

PROTECT MODE- The cursor is prevented from entering any character space which has the protected field attribute.

INSERTION MODE- Characters from the cursor position to the right margin (or first protected field) are moved to the right as each new character is inserted for display.

2.3 Screen Saver

IMPORTANT: High brightness levels may result in premature burning of the display tube phosphor. It is recommended therefore that the terminal be operated with the screen brightness at mid-level and the screen saver feature enabled.

When the screen saver feature is enabled and the ERGO 201 has been inactive for 9 minutes, i.e., no transmission or reception has occurred, but power is applied, the screen will blank automatically to prolong the picture tube life. When new data is received, or the operator depresses any key, the screen is immediately restored. The key which restores the display is not transmitted. The screen saver feature is not active whenever the operator is in SET-UP mode and may be selected or disabled by a programmable switch in SET-UP Mode B.

2.4 Keyboard

The ERGO 201 keyboard supports three key rollover which allows extremely fast typing speed and key stroke overlap. With three key rollover, if three keys are depressed, the terminal will process the first 2 keys in the order in which they were depressed and process the third key as soon as either of the other two are released. Except for this feature, the ERGO 201 keyboard functions exactly as does a typewriter. The proper code associated with the key legend is transmitted each time a key is depressed. The SHIFT key is used to send the upper case/SHIFTed characters, and CAPS LOCK forces all alphabetic keys to be transmitted in upper case independent of the SHIFT key. Keys which are not alphabetic must be SHIFTed to obtain the upper case legend even if the CAPS LOCK is depressed. Keys which function other than to send the code associated with their legend are described below.
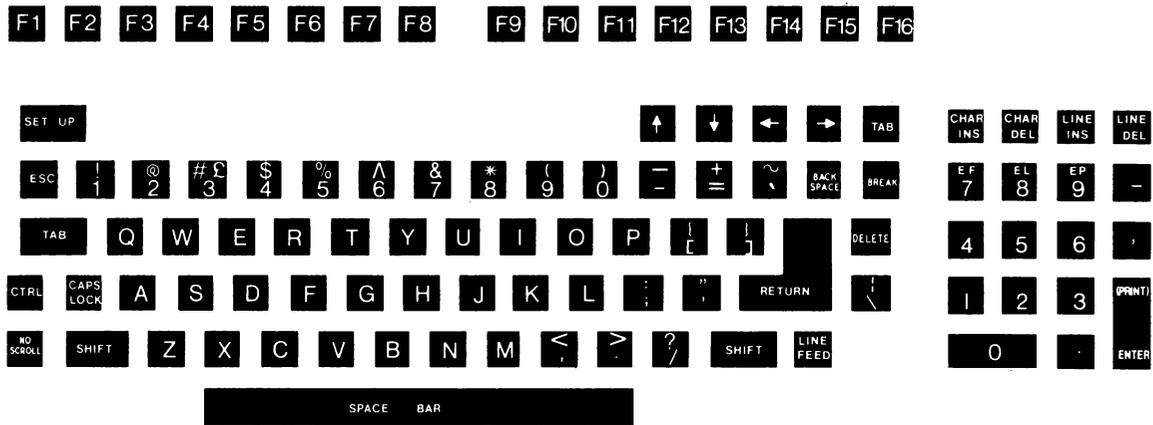
FIGURE 2.3.0

2.4.1 Control Key

When depressed simultaneously with another key, one of 32 non-displayable control codes will be transmitted (See Section 3.1.3).

2.4.2 Escape Key

Transmits the control Code for ESCAPE (1BH). Normally, this key introduces subsequent characters as special commands.

2.4.3 Edit Keys

The 15 editing keys listed in Table 2.4.1 will perform the indicated function locally if the EDIT KEYS: Local/Duplex Switch in SET-UP C is set for local. They will transmit the listed code sequence to the host if the EDIT KEYS: Local/Duplex Switch is set to Duplex. This operation will occur regardless of the LOCAL/ON-LINE/BLOCK Mode setting.

The Editing Keys are not affected by the modifier keys (SHIFT, CAPS LOCK and CTRL), with the following exceptions:

The Erase Field (7/EF), Erase Line (8/EL) and Erase Page (9/EP) functions are invoked by simultaneous depression of CTRL and the desired key.

Depression of the CLR/HOME key with no modifiers will perform the HOME function. Simultaneous depression of the SHIFT and HOME/CLR key will perform a CLEAR function.

Depression of the TAB key with no modifiers will perform a TAB. Simultaneous depression of the SHIFT and TAB keys will perform a BACKTAB operation.

The code sequences transmitted by the Editing Keys may be programmed in Custom Set-up Mode 4. (Section 3.3.1) The arrow (editing) keys perform special functions in the various SET-UP Modes independent of any custom definition (Sections 2.5.1, 2.5.2, and 3.2.1-3).

TABLE 2.4.1   EDITING KEYS

KEY	ACT-5A	ADM 3A	VT52	925
Cursor Up	CTRL Z	CTRL K	ESC A	CTRL K
Cursor Down	CTRL K	CTRL J	ESC B	CTRL V
Cursor Right	CTRL X	CTRL L	ESC C	CTRL L
Cursor Left	CTRL H	CTRL H	ESC D	CTRL H
Backspace	CTRL H	CTRL H	CTRL H	CTRL H
Insert Character	ESC G	----	----	ESC Q
Delete Character	ESC 6	----	----	ESC W
Insert Line	ESC 7	----	----	ESC E
Delete Line	ESC 8	----	----	ESC R
Erase Field	ESC K			
Erase Line	CTRL -	----	----	ESC Y
Erase Page	ESC ^	----	----	ESC T
Tab	CTRL I	CTRL I	CTRL I	CTRL I
BackTab	CTRL R	----	----	ESC I
Home	CTRL]	CTRL ^	----	CTRL ^
Clear	CTRL L	CTRL Z	----	ESC *

2.4.4 Function Keys (F1 through F16)

These are special function keys for use ON-LINE. The 16 function keys are used with the CTRL and SHIFT keys to generate up to 48 unique code sequences. The code sequences for the SHIFTed and UnSHIFTed functions may be down loaded from the host computer (Section 3.7). The default code sequences generated by the function keys are shown in Table 2.4.2 These values are always adopted whenever the 201 is powered up or reset. Response to these keys is host application dependent.

When the operator depresses any function key while simultaneously depressing the "CTRL" key, a previously stored message is transmitted to the host. The programmable function keys are normally used to transmit key sequences commonly encountered by the operator such as LOGON responses, directory requests, etc. Each message may contain up to 16 characters. The definition of the 16 CTRL+function key combinations may be saved in non-volatile memory so that the user definitions will not be lost even when the 201 is powered down or reset. For information on programming these keys, please see Section 2.7.3.

TABLE 2.4.2   FUNCTION KEY CODES

| ACT-5A   ADM 3A   VT52 | | | (= Base Emulation =) | | | | | 925 | |

KEY	UNSHIFTED	SHIFTED	UNSHIFTED				SHIFTED		
F1	ESC D	ESC d	CTRL A @	CTRL M			CTRL A `	CTRL M	
F2	ESC E	ESC e	CTRL A A	CTRL M			CTRL A a	CTRL M	
F3	ESC F	ESC f	CTRL A B	CTRL M			CTRL A b	CTRL M	
F4	ESC G	ESC g	CTRL A C	CTRL M			CTRL A c	CTRL M	
F5	ESC H	ESC h	CTRL A D	CTRL M			CTRL A d	CTRL M	
F6	ESC I	ESC i	CTRL A E	CTRL M			CTRL A e	CTRL M	
F7	ESC J	ESC j	CTRL A F	CTRL M			CTRL A f	CTRL M	
F8	ESC K	ESC k	CTRL A G	CTRL M			CTRL A g	CTRL M	
F9	ESC L	ESC l	CTRL A H	CTRL M			CTRL A h	CTRL M	
F10	ESC M	ESC m	CTRL A I	CTRL M			CTRL A i	CTRL M	
F11	ESC N	ESC n	CTRL A J	CTRL M			CTRL A j	CTRL M	
F12	ESC O	ESC o	CTRL A K	CTRL M			CTRL A k	CTRL M	
F13	ESC P	ESC p	CTRL A L	CTRL M			CTRL A l	CTRL M	
F14	ESC Q	ESC q	CTRL A M	CTRL M			CTRL A m	CTRL M	
F15	ESC R	ESC r	CTRL A N	CTRL M			CTRL A n	CTRL M	
F16	ESC S	ESC s	CTRL A O	CTRL M			CTRL A o	CTRL M	

2.4.5 Break Key

Forces the Break state to the host (See 3.1.1).   Simultaneous depression of the BREAK and CTRL keys results is transmission of the answer back message.

2.4.6 SET-UP Key

Used to enter and exit the SET-UP mode. The SET-UP mode enables special displays and keyboard functions to configure the ERGO 201 for compatibility to the host and for maximum user comfort. Details for using the SET-UP mode are found in Section 2.5.

The SET-UP key is also used to change emulation or to enter Custom Mode SET-UP (Section 3.2).

2.4.7 Enter/Print Key

When the terminal is in LOCAL Mode the ENTER/PRINT key will perform a Carriage Return (the Carriage Return will be followed by a Line Feed if the NEW LINE mode is enabled. See section 3.3.5)

If the terminal is ON-LINE the 201 will transmit the code(s) for Carriage Return (and Line Feed, if NEW LINE mode is enabled), Hex 0D and 0A, respectively.

If the terminal is in BLOCK Mode the ENTER/PRINT Key performs a SEND operation, the extent of which is determined by switch settings described in sections 2.15.1, 2.15.2, and 3.5.1. See section 4.8 for additional "SEND" information.

Simultaneous depression of the SHIFT and ENTER/PRINT keys while the terminal is in BLOCK Mode results in a PRINT operation, the extent of which is determined by switch settings described in sections 2.16.1, 2.16.2, and 3.5.2. See section 4.8 for additional "PRINT" information.

Simultaneous depression of the CTRL and ENTER/PRINT keys will cause the terminal to alternately enter and exit AUTO-PRINT Mode, regardless of whether the terminal is in LOCAL, ON-LINE or BLOCK Mode.

2.5 SET-UP Mode

All switchable features of the ERGO 201 are accessible from the keyboard in SET-UP mode. The switch settings can be preserved upon command from the keyboard in an EAROM (Electrically Alterable Read Only Memory) within the ERGO 201. The EAROM maintains data integrity even when the power is off. Each time the ERGO 201 is turned on, the switch settings are restored from the EAROM.

There are 3 major SET-UP modes - SET-UP A, SET-UP B, and SET-UP C available to the operator. Each is explained in detail in following sections of this manual.

Note that if the AUTO-PROTOCOL feature is enabled SET-UP Mode entry and exit will result in automatic transmission of the selected protocol (XON/XOFF or DTR) to the host. If XON/XOFF protocol is selected SET-UP Mode entry and exit will result in transmission of XOFF and XON, respectively. If DTR protocol is selected SET-UP Mode entry will cause the DTR line to go low and SET-UP Mode exit will cause the DTR line to go high.

2.5.1 Cursor Movement

The cursor always remains above the ruler, but may be positioned horizontally by using the space bar, left and right arrow keys, tab, and the return key.

2.5.2 Intensity

To change the intensity (brightness) of the display, use the up and down arrow keys. Each depression of the up arrow increases the intensity. The down arrow decreases the intensity. There are 32 levels of brightness.

IMPORTANT: High brightness levels may result in premature burning of the display tube phosphor. It is recommended that the brightness level be set to mid-range and that the screen-saver feature be enabled.

2.5.3 LOCAL/ON-LINE/BLOCK

The 4/$ key is used to change between LOCAL, ON-LINE and BLOCK Modes. The current status is indicated by the keyboard lamps (section 2.2).

2.5.4 SET-UP Mode Selection

The 5/% key is used to enter SET-UP B from SET-UP A, or SET-UP C from SET-UP B. Depression of this key will move the user alphabetically through the three SET-UP modes with SET-UP A entered upon depression of this key while in SET-UP C.

2.5.5 Reset

The 0/) key causes the ERGO 201 to be reset, perform the self
tests, and assume the SET-UP features that were last saved in
the EAROM. This is the same sequence as performed during power
up.

2.5.6 Abort Send/Print Operation

Simultaneous depression of the SHIFT and 0/) keys while in SET-
UP Mode will cause the terminal to abort all SEND and PRINT
operations upon SET-UP Mode exit.

2.5.7 Save SET-UP Features

Depression of SHIFT and S simultaneously initiates a SAVE opera-
tion causing the current SET-UP features to be saved in the
EAROM (Electrically Alterable Read Only Memory).   Whenever the
ERGO 201 is powered up, or a recall function is performed, the
SET-UP features will match those features last saved in the
EAROM.   Whenever a save operation is performed, the "TRAN-
SPARENCY MODE" bit is reset. After depression of SHIFT + S keys,
the screen will go blank while the SAVE operation is performed.
After approximately 10 seconds, the features will have been
saved, and the SET-UP A display is restored.

If changes to emulation-dependent features (ie. a change of emu-
lation mode, changes to the switches in Custom SET-UP Mode 4, or
assignment of Custom Codes) have been made the terminal will
display:

EMULATION CHANGES HAVE BEEN MADE: Adopt ? (y or n)

To save the changes type a "y" (upper or lower case). Any other
response will abort the SAVE operation without adopting the emu-
lation dependent changes or modifying the non-volatile EAROM
data.

2.5.8 Recall SET-UP Features

Simultaneous depression of SHIFT and R while in SET-UP mode
cause the ERGO 201 to RECALL the SET-UP features that were last
saved in the EAROM. The ERGO 201 will respond about 5 seconds
later with a beep. If five beeps are sounded, the ERGO 201 is
unable to verify the integrity of the data, and the operator
must verify and reestablish the SET-UP features individually.
See Table 2.5.1 for the list of such features which may be saved
and recalled from the EAROM.

2.5.9 Default Values

The ERGO 201 will default to the factory settings shown in Table 2.5.1 if an error is detected in the EAROM, or if the operator depresses the SHIFT and 'D' keys simultaneously while in SET-UP Mode. The contents of the EAROM are not altered when the default values are invoked.

TABLE 2.5.1   DEFAULT VALUES

SET-UP MODE	SWITCH	FUNCTION	DEFAULT VALUE
A	N/A	Emulation	ACT-5A
A	N/A	Tabs	columns 8,16,24,32 41,49,57,65 and 73
All	N/A	LINE/LOCAL/BLOCK	LOCAL
B	N/A	IO Baud Rate	9600
C	N/A	Print Baud Rate	9600
B	1.1	Cursor: Enable/Disable	Enabled
B	1.2	Cursor: Block/Line	Block
B	1.3	Cursor: Steady/Blink	Blink
B	2.1	Screen Background	Normal
B	2.2	Scroll	Jump
B	2.3	Scroll Speed	Slow
B	2.4	Screen Saver	Enabled
B	3.1	Margin Bell	Disabled
B	3.2	Key click	Enabled
B	3.3	25th Line	Disabled
B	3.4	25th Line	Status
B	5.1	Local Echo	Disabled
B	5.2	Data Rate to Host	Unlimited
B	5.4	Stop Bits	1
B	6.1	Data Bits	8
B	6.2	8th Data Bit	1
B	6.3	Parity Sense	Odd
B	6.4	Parity	Disabled
C	1.1	Send Key	Extent
C	1.2	Send Extent	Line
C	1.4	Send	Unprotected Only
C	2.1	Print Key	Extent
C	2.2	Print Extent	Line
C	2.4	Edit Keys	Local
C	3.1	Status Line-Cursor	Disabled
C	3.2	Status Line-Time	Disabled
C	4.1	Status Line-Printer	Disabled
C	4.2	Status Line-Transmit	Disabled
C	4.3	Status Line-Interface	Disabled
C	4.4	Status Line-Buffer	Disabled
C	5.1	Protect Mode	Disabled
C	5.2	Transparency Mode	Disabled
C	5.4	Stop Bits	1
C	6.1	Data Bits	8
C	6.2	8th Data Bit	1
C	6.3	Parity Sense	Odd
C	6.4	Parity	Disabled

2.6 SET-UP A

The SET-UP mode is entered by depressing the SET-UP key. Data on the screen upon entering SET-UP is preserved within the ERGO 201 and restored upon SET-UP exit. The SET-UP A display will appear similar to Figure 2.6.1 when the SET-UP key is depressed. SET-UP A shows each currently selected tab position as a T above the ruler at the bottom of the screen. (See Section 2.6.1)

SET-UP A   EMULATION: ACT-5A   PRESS "SHIFT + SET-UP" TO CHANGE

TO EXIT PRESS "SET-UP"   PRESS "CTRL + SET-UP" TO CUSTOMIZE

```
       T       T       T       T       T       T       T       T       T
1234567890░░░░░░░░1234567890░░░░░░░1234567890░░░░░░░░1234567890░2░░░░░░
```
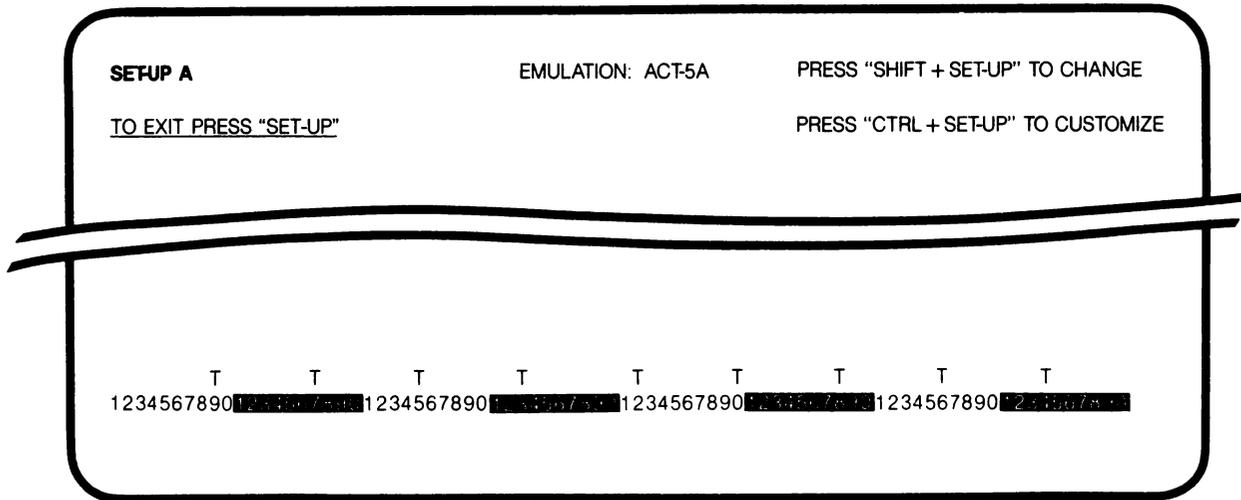
FIGURE 2.6.1

While in SET-UP A Mode, the following functions may be performed.

2.6.1 Tabs

To set or clear a tab, position the cursor at the appropriate column and depress the 2/@ key. A "T" will appear or be erased to reflect the new tab status for that column. To clear all tabs, depress the 3/# key. Default positioning of the tab stops at columns 8,16,24,32,41,49,57,65 and 73 is accomplished by depressing "SHIFT T". The tab settings may be stored in non-volatile memory by performing a "SAVE" operation. (See Section 2.5.7)

2.6.2 Changing Emulations

To change the emulation modes depress the SHIFT and SET-UP keys simultaneously and the ERGO 201 will advance to the next emulation mode. The sequence of emulation modes is:

ACT-5A
ADM 3A
VT52
925

CAUTION!

Changing emulation modes will always cause the screen to be cleared upon exit from SET-UP Mode.

If changes to emulation-dependent features (ie. a change of emulation mode, changes to the switches in Custom SET-UP Mode 4, or assignment of Custom Codes) have been made, attempts to perform a "SAVE" operation or to exit SET-UP Mode will result in the following display:

EMULATION CHANGES HAVE BEEN MADE: Adopt ? (y or n)

To save the changes type a "y" (upper or lower case).

Any other response will exit SET-UP mode without adopting the new emulation, i.e. emulation dependent parameters will be the same as they were on SET-UP mode entry.

If you choose to adopt the emulation upon SET-UP Mode exit, the terminal will also do the following:

● Load Default Control Codes and Escape Sequences for the new emulation

- Load Default Values for Fl => F16 (Shifted & Unshifted)

- Load Default Values for Custom Set-up Mode 4 switches

- Select Appropriate Attribute Mode: ACT-5A or 925

- Clear all Custom Mode assignments

- Abort all SEND and PRINT Operations in Progress

- Exit Graphics Mode

- Exit Alternate Key pad Mode

- Exit Hold Screen Mode

- Reset Scrolling Window to Entire Screen

- Select Normal Character Set

- Select Page 1 of Screen Memory

2.6.3 Entering Custom SET-UP Mode

To enter Custom SET-UP Mode from SET-UP A simultaneously depress the CTRL and SET-UP keys. (See Section 3.2)

2.7 SET-UP B

When entering SET-UP B Mode by depressing the 5/% key from SET-UP A Mode, a display similar to Figure 2.7.1 will appear. In the SET-UP B Mode, there are six groups of four switches which may be set or reset from the keyboard. To change a switch setting, position the cursor above the appropriate switch using the left and right cursor arrow keys, tab, return, or the space bar. Once the cursor is positioned, press the 6/^ key and observe that the switch toggles from 1 to 0 or 0 to 1 and the underline moves to the other definition. The function associated with the new switch setting is then appropriately adopted. Refer to Figure 2.7.2 to identify each switch, and to Sections 2.8 to 2.13 for a complete description of each switch function.

For example, to change the screen background, position the cursor directly above the first (left to right) switch in the second group. Depress the 6/^ key, and observe that the background reverses and the switch setting is changed. Switch settings will remain in effect until individually changed by the operator in SET-UP mode, or remotely changed by the host, or the ERGO 201 is reset. When power is turned on or a reset operation is performed, the SET-UP features will match those which were last saved in the EAROM. To permanently save the SET-UP features in the EAROM, a SAVE operation may be performed as described in SET-UP A. Other keys which have effect in SET-UP B Mode are described on the next page.

SET-UP B   EMULATION: ACT-5A

TO EXIT PRESS "SET-UP"

┌ 25TH LINE: Enabled/Disabled

1 0010   2 1111   3 1011   4 0000   5 0000   6 1111   IO BAUD RATE: 9600

┌ 25TH LINE: USER/STATUS

1 0010   2 1111   3 1010   4 0000   5 0000   6 1111   IO BAUD RATE: 9600

P: R: C: TIME
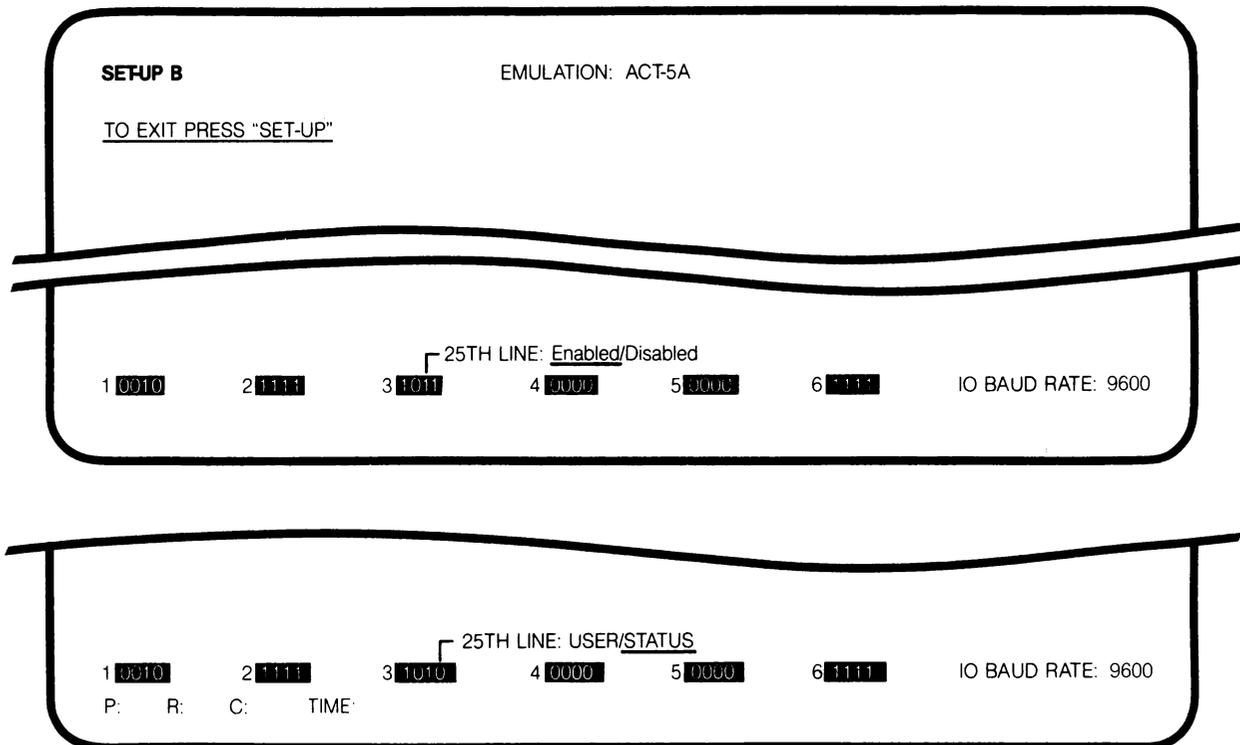
FIGURE 2.7.1

2.7.1 IO Baud Rate

7/& - each depression of this key causes the IO data rate to be changed to the next standard value. The 13 standard values are 75, 110, 134.5, 150, 200, 300, 600, 1200, 2000, 2400, 4800, 9600, and 19,200 baud. The currently selected value appears on the display.

2.7.2 Answer Back Message

A (upper case) - is used to set the Answer Back message. The ERGO 201 will respond by displaying "A = " on the display. The first character entered by the operator is the message delimiter character. This may be any character which is not to be used in the actual message. The delimiter will be displayed, but is not actually part of the message. After the message is entered and the delimiter is typed again, the the bell will ring to indicate that the new definition has been accepted, and the message will disappear from the screen. Control codes (00H-1FH) may be part of the message. All control codes should be produced by using the CTRL key and the appropriate alphabetic key. When programming the answer back message, control codes are represented in reverse video by the corresponding upper case character which has the same lower 5 bits and preceded by "^". For example, "RETURN" or CTRL "M" is represented as "^M". The message may consist of up to 20 characters. No additional characters will be accepted after the 20th character, at which point the operator should type the delimiter character to define the new message, or the SET-UP key to abort the new definition. If an error is made when preparing the answer back message, type the delimiter character and start again by typing A. To permanently store the prepared answer back message, perform SAVE operation.

2.7.3 Programmable Function Keys

The 16 user-definable function keys are programmed in SET-UP mode "B" by depressing "CTRL Fx" (x = 1-16). The ERGO 201 responds by displaying the current key definition with control codes represented by "^" followed by the associated displayable character in reverse video. For example, "RETURN" is displayed as "^M". The operator may then exit by depressing "SET-UP", go on to review other function keys by depressing CTRL Fx, or redefine the key displayed.

In order to redefine a function key, depress CTRL + Fx (x=1-16) while in SET-UP B. For example, CTRL + F1 will display F1 = (Message). To change the message or character string, type any character (except "L") to act as the delimiter for the beginning of the new message string. The ERGO 201 will accept up to 16 characters as a message string, and will stop accepting characters when a second delimter character is typed or when the 16th character has been typed. When the second delimiter character has been typed the bell will ring to indicate that the new message has been accepted.

For example, if the message string is STOP followed by a bell, one might type ".STOP [CTRL] G.", in order to store the message. In this example, the periods are message delimiters, and the message string will appear as "STOP ^G". Each definition may be up to 16 characters in length, and contain any of the 128 ASCII codes except the delimiter. Control characters count as 1 character even though displayed as 2 characters.

The total number of characters available for for all 16 function keys depends on the number of Control Codes and Escape Sequences defined in Custom Mode; therefore a function key definition will be automatically terminated if the operator attempts to exceed the available memory space. The number of EAROM bytes currently available is displayed in the upper right corner of the screen. A key definition will be automatically terminated if the operator attempts to exceed the available memory space.

In case of error, the operator may exit from programming the function key by depressing SET-UP or CTRL Fx without disturbing the previous key definition. The new definition is not adopted until the operator strikes the delimiter key for the second time. To permanently store the new function key definition, perform a "SAVE" operation.

The User-Programmable Function Keys may be designated as LOCAL function keys, in which case the code sequence assigned to the key by the operator will be processed locally by the terminal instead of being sent to the host. To designate a function key as LOCAL ONLY type the 'L' key (upper or lower case) before typing the first delimiter character. The terminal will display 'LOCAL:' to indicate that a local only function key is being defined. Then type the first delimiter and program the key as described above.

For example, in ACT-5A mode F16 could be defined to be an underline current character key by entering the following 6 key sequence while in SET-UP B:

<u>CTRL+F16</u> <u>L</u> . <u>ESC</u> <u>A</u> .

KEYSTROKE	PURPOSE
CTRL+F16	identify Function Key
L	signify LOCAL function
.	arbitrary delimiter
ESC	actual definition (1st character)
A	actual definition (2nd character)
.	definition delimiter (terminator)
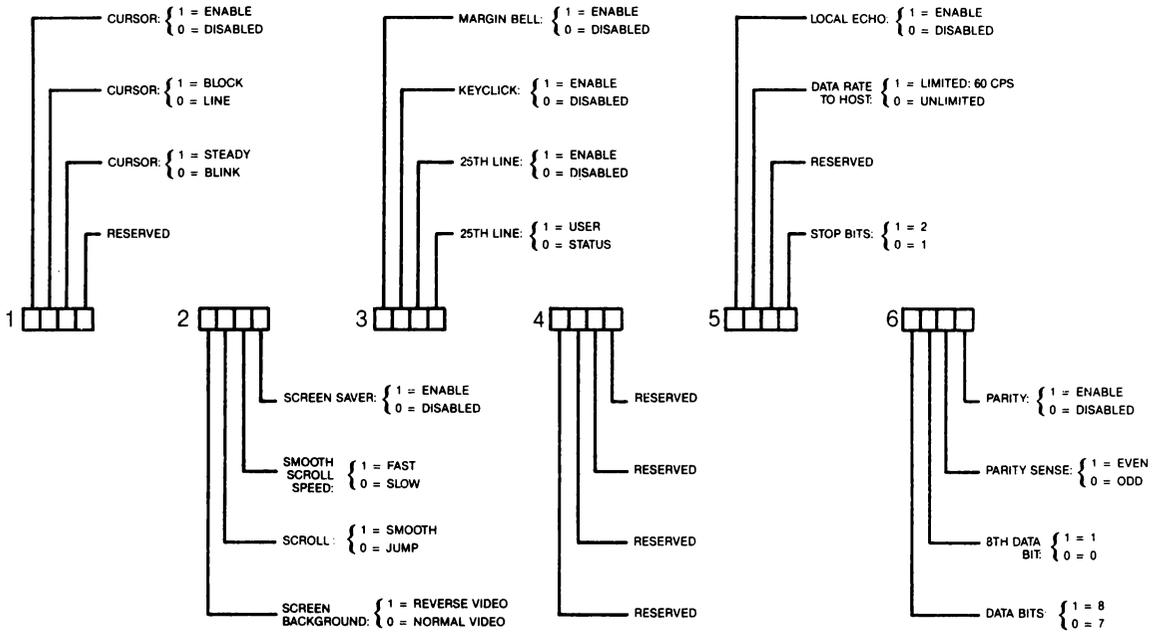
FIGURE 2.7.2

2.8 SET-UP B Switches: Group 1

2.8.1 Cursor Enable/Disable

When enabled (Switch = 1) the cursor will be displayed. When disabled (Switch = 0) the cursor will not be displayed.

2.8.2 Cursor Block/Line

When enabled (Switch = 1) the cursor will appear as a block marker. When disabled (Switch = 0) the cursor appears as a line marker.

2.8.3 Cursor Steady/Blink

When the switch = 1 the cursor will not blink. When the Switch = 0 the cursor will blink.

2.9 SET-UP B Switches: Group 2

2.9.1 Screen Background

When enabled (Switch = 1), this feature produces a light background with dark characters. When the switch is set to 0, light characters appear upon a dark background.

2.9.2 Scroll

Scrolling is the vertical movement of the display to make room for new lines at the top or bottom of the screen. When set for Jump Scroll (Switch = 0), the display "jumps" one full character row at a time upon command from the host. When the host causes a rapid succession of jump scrolls, the display may be difficult to read. Smooth Scroll (Switch = 1) limits the number of scrolls to six or twelve per second (depending on the setting of the Smooth Scroll Speed Switch) and the vertical movement occurs at a steady rate. To insure that no data is lost when smooth scroll is enabled, the ERGO 201 and the host should be synchronized by selecting the Auto-Protocol feature, which must be supported by the host.

2.9.3 Smooth Scroll Speed

The operator may choose between two smooth scroll speeds. "Slow" scroll moves the display vertically at a maximum rate of 6 lines per second. "Fast" smooth scroll allows a rate of 12 lines per second.

2.9.4 Screen Saver

With this switch enabled, the screen will automatically blank after 9 minutes of inactivity. The display will be restored upon receipt of any data from the host or depression of any key by the operator. A key depression which restores the display

does not cause any code to be transmitted or the character to be displayed.

2.10   SET-UP B Switches: Group 3

2.10.1   Margin Bell

When enabled (Switch = 1), a "beep-beep" will sound whenever the operator types past column 72. The margin bell is disabled when the switch equals 0.

2.10.2   Key Click

When enabled (Switch = 1), a click will be sounded with each key stroke that generates a code from the ERGO 201. The click is disabled when the switch equals 0.

2.10.3   25th Line

This switch enables or disables display of the 25th line.

2.10.4   25th Line - User/Status

With the switch = 1 user messages may be displayed on the 25th line (See Section 4.5, function #119 for information on loading the user line). With the switch = 0, status and diagnostic information (selected in SET-UP Mode C) is displayed on the 25th line.

2.11   SET-UP B Switches: Group 4

These switches are reserved for addition of features in the future and currently have no effect on the operation of the terminal.

2.12   SET-UP B Switches: Group 5

2.12.1   Local Echo

When enabled (Switch = 1), all characters which are transmitted by the ERGO 201 to the host are also processed locally as if they had been echoed by the host. Local Echo is normally not used in a full duplex environment.

2.12.2   Limited Transmission Rate

When enabled (Switch = 1), this feature limits data transmission from the ERGO 201 to the host to a maximum of approximately 60 Characters Per Second, regardless of Baud Rate. Since the key-board auto-repeat rate is independently limited to 30 CPS by the terminal, the limited transmission rate primarily affects automatic transmissions by the terminal, such as transmission of the answer back message, or programmable function keys.   This feature is necessary in installations where the host computer requires that the incoming data not exceed 60 CPS.

2.12.3 Stop Bits

This switch determines whether one (Switch = 0) or two (Switch = 1) stop bits will be transmitted with each character.

2.13 SET-UP B Switches: Group 6

2.13.1 Data Bits

This feature allows the ERGO 201 to transmit and receive either seven or eight bits per character. Eight bit operation is selected when the switch equals 1. The eight bit may be either a logical 0 or a logical 1, depending on the setting of the 8th Data Bit Switch. During reception, the eight bit is ignored.

2.13.2 8th Data Bit

This feature determines whether the 8th data bit is a logical 0 (Switch = 0) or a logical 1 (Switch = 1).

2.13.3 Parity Sense

If parity has been enabled, the switch determines which method of parity checking will be employed by the ERGO 201. When the switch equals 0, odd parity is generated with each transmitted character and verified against each received character. If the received character does not have the proper parity, the character will be rejected and a checkerboard pattern is displayed. When the switch equals 1, even parity is generated in the same manner and verified.

2.13.4 Parity

When enabled (Switch = 1), the ERGO 201 will include a parity bit with each transmitted character and verify the parity of each received character. When parity is enabled, parity sense must be properly set to select even or odd parity.

2.14 SET-UP C

SET-UP Mode "C" is entered by depressing SHIFT 5/% from SET-UP Mode "B". The SET-UP "C" display includes 6 groups of 4 switches. The "switches" are toggled as in SET-UP mode "B". The cursor is positioned horizontally to the appropriate switch and the 6/^ key is used to toggle the switch. The switch definition and selected position are described above the switch. The SET-UP "C" settings may be permanently stored by performing a "SAVE" operation. To exit SET-UP "C" mode to SET-UP "A" mode, depress the 5/% key.

2.14.1 Printer Baud Rates

To change the printer speed, use the 7/& key. Each key stroke selects the next one of 13 speeds. The display indicates the printer serial baud rate of 50, 75, 110, 134.5, 150, 300, 600, 1200, 2400, 4800, 7200, 9600, or 19,200.

SET-UP C   EMULATION: ACT-5A

TO EXIT PRESS "SET-UP"

┌STATUS LINE-TRANSMIT: Enabled/Disabled

1 ▮▮▮   2 ▮▮▮   3 ▮▮▮   4 ▮▮▮   5 ▮▮▮   6 ▮▮▮   PRINTER BAUD RATE: 9600
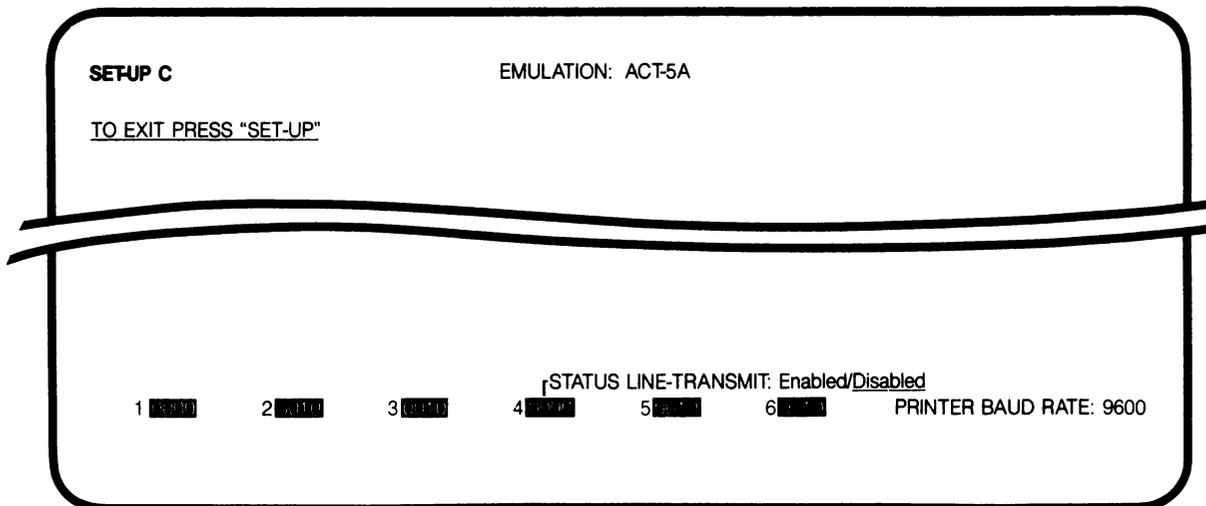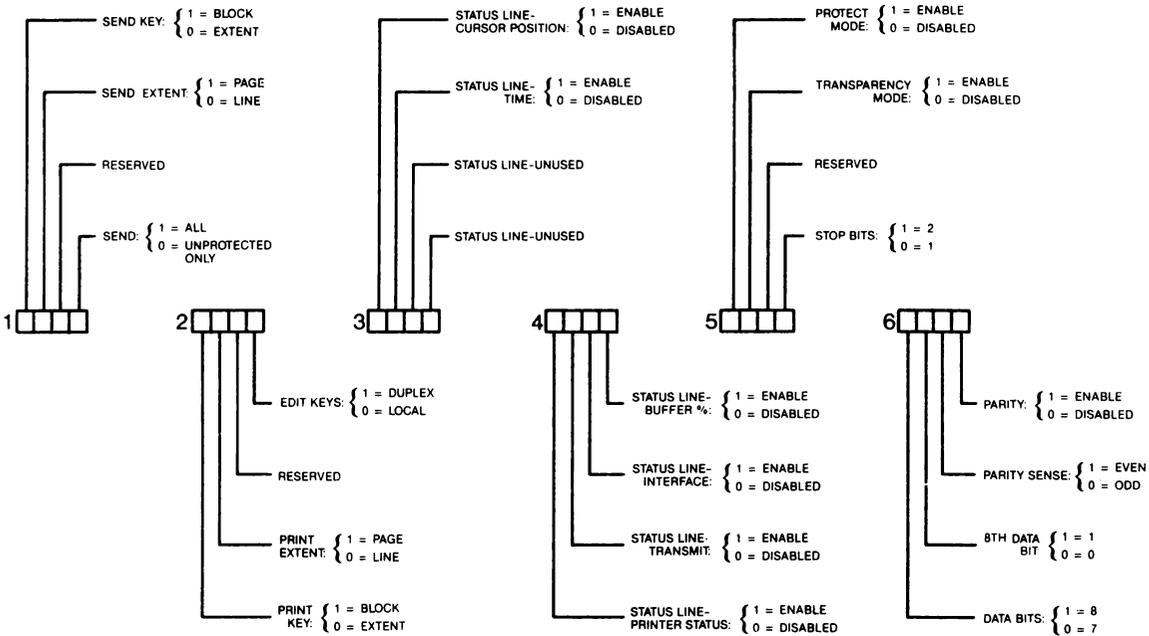
FIGURE 2.14.1

FIGURE 2.14.2

2.15 SET-UP C Switches: Group 1

2.15.1 Send Key

This feature determines the type of SEND operation performed when the ENTER/PRINT key is depressed and the terminal is in Block Mode. When the switch = 1 the terminal will send the data between block markers (Section 4.8). When the switch = 0 the extent of the SEND operation (line or page) is determined by the setting of the SEND EXTENT Switch.

2.15.2 Send Extent

This switch configures the terminal to SEND either the current line (marked by the cursor): Switch = 0 or the current page (displayed): Switch = 1. A Switch in CUSTOM SET-UP Mode 4 determines whether the entire line/page is sent or only data up to the current cursor position.

2.15.3 Send Data Type

With this switch set to 0 the terminal will send only unprotected data. With the switch set to 1 all data (protected and unprotected) will be sent.

2.16 SET-UP C Switches: Group 2

2.16.1 Print Key

This switch determines the type of print operation the terminal will perform in response to simultaneous depression of the SHIFT and ENTER/PRINT keys when the terminal is in Block Mode. When the switch = 1 all data between block markers will be printed (Section 4.6.1). When the switch = 0 the extent of the print operation is determined by the setting of the PRINT EXTENT Switch.

2.16.2 Print Extent

This switch configures the terminal to print either the current line (Switch = 0) or the page (Switch =1) when the SHIFT and ENTER/PRINT keys are simultaneously depressed and the terminal is in Block Mode. A Switch in CUSTOM SET-UP Mode 4 determines whether the entire line/page is printed, or only data up to the current cursor position.

2.16.3 Edit Keys - Local/Duplex

This switch determines whether the Edit Keys will perform their functions locally (Switch =0) or will transmit the appropriate code sequence to the host (Switch = 1)

2.17 SET-UP C Switches: Group 3

SET-UP C Switch Groups Three and Four configure the status/ diagnostic information which will appear on the 25th line. The 25th Line must be enabled and set for status (See Sections 2.10.3 and 2.10.4) for this information to be displayed.

2.17.1 Status Line - Cursor Position

With this feature enabled (Switch = 1) the current page, row and column will be displayed on the 25th line.

2.17.2 Status Line - Time

With this feature enabled (Switch = 1) the time will be displayed in a 24 hour format on the 25th line. The Time may be set by a standard 925 Escape Sequence, or by assigned a Custom Mode function.

2.18 SET-UP C Switches: Group 4

2.18.1 Status Line - Printer Status

With this feature enabled (Switch = 1) the type of print operation currently selected is displayed on the 25th line.

2.18.2   Status Line - Transmit

With this feature enabled (Switch = 0) the type of send   opera-
tion currently selected is displayed on the 25th line.

2.18.3   Status Line - Interface

With this feature enabled (Switch = 1) the status of the printer
DTR line, printer XON/XOFF status and IO XON/XOFF status is
displayed in the 25th line.

2.18.4   Status Line - Buffer%

With this feature enabled (Switch = 1) the number of characters
in the ERGO 201's 256 character input buffer is displayed in
bar-graph format. There are 8 positions which fill from left to
right as the buffer becomes more full. When the first position
fills there are between 1 and 32 characters in the buffer.   For
each additional 32 characters in the buffer, the bar-graph moves
one position to the right. When the buffer contains 160 or more
characters, the bar-graph appears in reverse video with blink to
emphasize that there may be a protocol problem, i.e., either
Auto-Protocol is not enabled or the host is not responding to
the protocol. If the buffer overflows a crosshatch symbol is
inserted in the data stream.

2.19   SET-UP C Switches: Group 5

2.19.1   Protect Mode

This switch is used to enter (Switch = 1) or exit (Switch = 0)
Protect Mode (Section 3.6.1; 4.2 #31,41; 4.5 #104,110).

2.19.2   Transparency Mode

For software debugging, transparency mode allows the display of
all data from the host including control and escape sequences.
Control codes are displayed in reverse video as "^" followed by
the displayable character which has the same lower 5 bits as the
control code in question. For example, "ESCAPE" is displayed as
"^[". When the operator leaves transparency mode, a cross hatch
symbol will be placed after the last character displayed while
in diagnostic mode. When performing a "SAVE" operation, tran-
sparency mode is disabled.

2.19.3   Stop Bits

This switch determines the number of stop bits 1 (Switch = 0) or
2 (Switch = 1) for each character sent to the printer.

2.20 SET-UP C Switches: Group 6

2.20.1 Bits Per Character

This switch allows the ERGO 201 printer port to transmit and receive either seven or eight bits per character. Eight bit operation is selected when the switch equals 1. During reception, the 8th bit is ignored.

2.20.2 8th Data Bit

This feature determines whether the 8th data bit on characters sent to the printer is a logical 0 (Switch = 0), or a logical 1 (Switch = 1).

2.20.3 Parity Sense

If parity has been enabled, this switch determines which method of parity checking will be employed by the ERGO 201 on the printer port. When the switch equals 0, odd parity is generated with each transmitted character to the printer and verified against any received characters from the printer. When the switch equals 1, even parity is generated and verified. If the received character does not have the proper parity, the character is ignored.

2.20.4 Parity

When enabled (Switch = 1), the ERGO 201 will include a parity bit with each transmitted character to the printer and verify the parity of each received character from the printer. When parity is enabled, parity sense must be properly set for even or odd parity.

2.21 SET-UP Feature Summary

SET-UP features are summarized below in two groups. The first group consists of those features that must be correctly set for the ERGO 201 to function properly in a particular environment defined by the computer interface, printer interface, and software of the host. The second group consists of those features which may be arbitrarily changed by the operator to maximize personal comfort.

NOTE: All features changed by the 6/^ key must have the cursor properly positioned.

TABLE 2.21.1   SETTINGS FOR HOST ENVIRONMENT

FEATURE	SET-UP MODE	KEY TO CHANGE FEATURE
ANSWER BACK MESSAGE	B	A+Special Sequence
AUTO-PROTOCOL	4	6/^
AUTO-REPEAT	4	6/^
BITS PER CHARACTER	B	6/^
EMULATION	A	SHIFT+SET-UP
IO BAUD RATE	B	7/&, 8/*
IO STOP BITS	B	6/^
IO 8th DATA BIT	B	6/^
LOCAL ECHO	B	6/^
LINE/LOCAL/BLOCK	A/B/C	4/$
NEW LINE	4	6/^
PARITY	B	6/^
PARITY SENSE	B	6/^
PRINTER => HOST	4	6/^
PRINT: Extent/To Cursor	4	6/^
PRINTER BITS PER CHARACTER	C	6/^
PRINTER DATA BITS	C	6/^
PRINTER 8th DATA BIT	C	6/^
PRINTER STOP BITS	C	6/^
PRINTER SPEED	C	7/&, 8/*
PRINTER PARITY	C	6/^
PRINTER PARITY SENSE	C	6/^
PROTOCOL	4	6/^
SEND: Extent/To Cursor	4	6/^
TABS	A	3/#, 2/@ + CURSOR
TRANSMIT RATE LIMIT	B	6/^
WRAP AROUND	4	6/^
XON-XOFF FROM HOST	4	6/^
925 ATTRIBUTES	4	6/^
PROTECTED ATTRIBUTES	4	6/^

2.21.1 Settings for Operator Convenience

The ERGO 201 contains English SET-UPs for the convenience of the operator. With this feature, it is no longer necessary to refer to a chart to determine the switches available in SET-UP B. To use this feature, position the cursor over any of the 16 blocks available in Set Up B, or 12 blocks available in SET-UP C, and read the switch setting immediately to the right of the cursor. The operator may also determine the switch setting by noting the underlined attribute. To change settings, merely depress the 6/^ key while the cursor is positioned above the attribute in question.

TABLE 2.21.2   SETTINGS FOR OPERATOR CONVENIENCE

FEATURE	SET-UP MODE	KEY TO CHANGE FEATURE
BACKGROUND	B	6/^
CURSOR ON/OFF	B	6/^
CURSOR LINE/BLOCK	B	6/^
CURSOR STEADY/BLINK	B	6/^
INTENSITY	A/B	UP OR DOWN ARROW
KEY CLICK	B	6/^
MARGIN BELL	B	6/^
RESET	A/B/C	0
PRINT KEY	C	6/^
PRINT EXTENT	C	6/^
SCROLL SMOOTH/JUMP	B	6/^
SCROLL SPEED	B	6/^
SCREEN SAVER	B	6/^
SEND KEY	C	6/^
SEND EXTENT	C	6/^
SEND ALL/UNPROTECTED	C	6/^
25th LINE ON/OFF	B	6/^
25th LINE USER/STATUS	B	6/^

3. PROGRAMMER INFORMATION

3.1 Keyboard

The keyboard produces the standard ASCII codes associated with each key legend. A summary of the ASCII codes appears in Appendix 6.1. All keys which are "programmable", or may send non-standard codes, are described below.

3.1.1 Break

Forces the output channel from the ERGO 201 to the host into the space state for .232 seconds. When the BREAK key is depressed simultaneously with the SHIFT key, the space state is held for 3.5 seconds, to provide the long break/disconnect modem signal. Simultaneous depression of the CTRL and BREAK keys causes the answer back message to be transmitted.

3.1.2 Return

This key may send a single code for RETURN (0DH) or RETURN and LINE FEED (0DH, 0AH) depending on the setting of the new line feature (Section 3.3.5).

3.1.3 Keyboard Generation of Control Codes

Table 3.1.1 indicates the keys required to generate the 32 ASCII control codes. Control combinations not listed in the table cause the null code to be transmitted.

TABLE 3.1.1

Key Pressed With CTRL Key Down (SHIFTed or UnSHIFTed)	Hex Code Transmitted	Function Mnemonic
Space Bar	00H	NUL
A	01H	SOH
B	02H	STX
C	03H	ETX
D	04H	EOT
E	05H	ENQ
F	06H	ACK
G	07H	BEL
H	08H	BS
I	09H	HT
J	0AH	LF
K	0BH	VT
L	0CH	FF
M	0DH	CR
N	0EH	SO
O	0FH	SI
P	10H	DLE
Q	11H	DC1 or XON
R	12H	DC2
S	13H	DC3 or XOFF
T	14H	DC4
U	15H	NAK
V	16H	SYN
W	17H	ETB
X	18H	CAN
Y	19H	EM
Z	1AH	SUB
[	1BH	ESC
\	1CH	FS
]	1DH	GS
~ (`)	1EH	RS
? (/)	1FH	US

3.1.4 Edit Keys

The default code sequences transmitted by the 15 editing keys are shown in Table 2.4.1. The code sequences transmitted by these keys may be redefined by the operator in CUSTOM SET-UP Mode 4 (section 3.3.1).

3.1.5 Auxilliary Key pad

The rightmost 14 keys constitute the Auxiliary Key pad. Codes sent from the Auxiliary Key pad depend on the currently selected emulation mode, and whether alternate key pad or numeric key pad mode (default) is selected.

TABLE 3.1.2   AUXILIARY KEY PAD CODES

Key	Numeric Mode	Key pad Alternate Mode
0	0	ESC ? p
1	1	ESC ? q
2	2	ESC ? r
3	3	ESC ? s
4	4	ESC ? t
5	5	ESC ? u
6	6	ESC ? v
7	7	ESC ? w
8	8	ESC ? x
9	9	ESC ? y
-	-	ESC ? m
,	,	ESC ? l
ENTER	[RETURN]	ESC ? M

3.2 Custom Mode Programming

Custom Mode SET-UP is used to display and program the ERGO 201's
responses to control codes and escape sequences.

As the operation of the terminal may be dramatically altered by
the Code Sequence/Function assignments in Custom Mode SET-UP, it
is recommended that the System Manager of your installation be
consulted before performing any changes in Custom Mode SET-UP.

To enter Custom Mode SET-UP place the terminal in SET-UP Mode A
and simultaneously depress the CTRL and SET-UP keys. The CUSTOM-
IZED CONTROL CODES display (Figure 3.2.1) will appear on the
screen.

The number of bytes (characters) of non-volatile memory (EAROM)
available for Custom Mode Definitions (and User Programmable Func-
tion Key messages) is displayed in the upper right portion of each
Custom Mode display. Attempts to define Control Codes or Escape
Sequences when sufficient memory is not available will be ignored.
Up to five code sequences may be assigned to each function (as
long as there is sufficient EAROM memory available).   The "NOP"
function is allowed to have more than five assignments. Each code
sequence, however, may be assigned to only one function. Attempts
to assign the same code sequence to two functions are indicated by
display of the error message "Code Previously Defined".

3.2.1 Displaying Control Code Definitions

To review the list of current Control Code Definitions, use the up or down arrow keys to scroll through the list one Control Code at a time. To cancel the definition of a Control Code, scroll through the list until the desired code is displayed and then depress the CTRL and Delete keys simultaneously. Subsequently, unless the Control Code is redefined as described below, the terminal will perform the the default function (if any) for this code as specified by the current emulation. To eliminate even the standard default function, see section 4.2(1).

The number of currently defined Control Codes is displayed to the left of the words: 'CUSTOMIZED CONTROL CODES'. The Function number to the left of the function description refers to the function position in the table of AVAILABLE FUNCTIONS.

CUSTOM MODE SET-UP 1   EMULATION: ACT-5A   EAROM BYTES LEFT: **94**

TO EXIT PRESS "SET-UP"

O CUSTOMIZED CONTROL CODES   SEQUENCE: CTRL + Hex

Use "CTRL DELETE" to remove   FUNCTION: NO FUNCTIONS CURRENTLY ASSIGNED
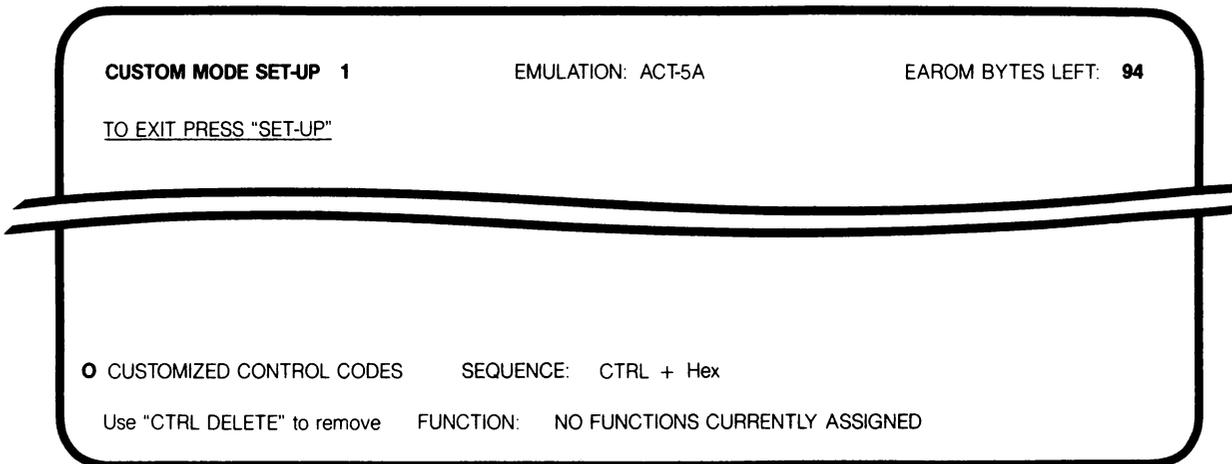
FIGURE 3.2.1

3.2.2 Displaying Escape Sequence Definitions

To review the list of current Escape Sequence Definitions depress the 5/% key to bring up the CUSTOMIZED ESCAPE SEQUENCES display, (Fig. 3.2.2) and use the up or down arrow key to scroll through the list. To cancel the definition of an Escape Sequence scroll through the list until that Escape Sequence and its definition are displayed, and then depress the CTRL and Delete keys simultaneously. Once again, unless the Escape Sequence is redefined as described below, the terminal will subsequently perform whatever function (if any) the current emulation specifies for this Escape Sequence. To eliminate even the standard default function, see section 4.2(1).

The number of currently defined Escape Sequences is displayed to the left of the words: 'CUSTOMIZED ESCAPE SEQUENCES'

CUSTOM MODE SET-UP 2   EMULATION: ACT-5A   EAROM BYTES LEFT: **94**

TO EXIT PRESS "SET-UP"

O CUSTOMIZED ESCAPE SEQUENCES   SEQUENCE: ESCAPE HEX:

Use "CTRL DELETE" to remove   FUNCTION: NO FUNCTIONS CURRENTLY ASSIGNED
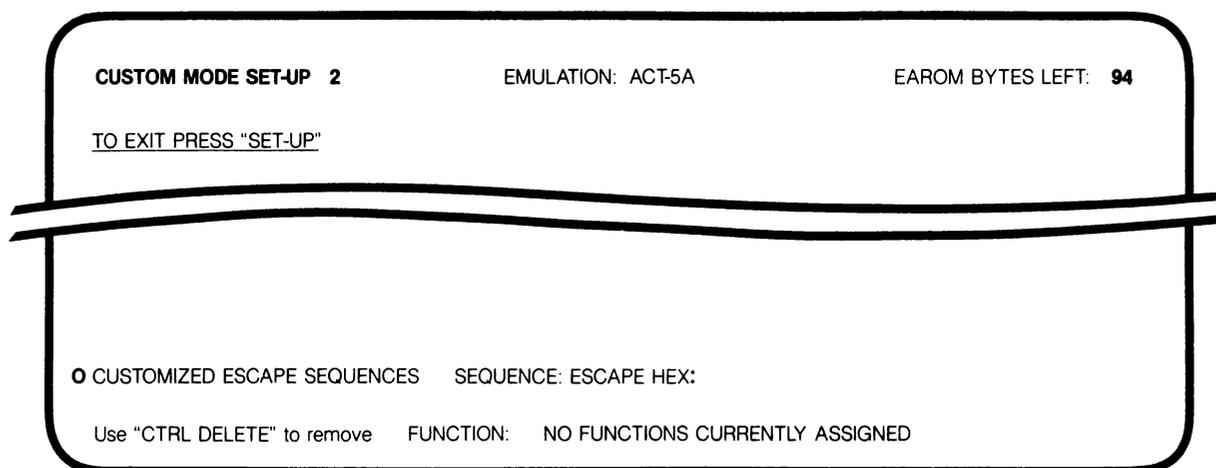
FIGURE 3.2.2

3.2.3 Defining Control Codes & Escape Sequences

To assign a Control Code or an Escape Sequence to a particular function type the 5/% key to bring up the AVAILABLE FUNCTIONS display, (Fig. 3.2.3) and use the up or down arrow keys to scroll through the list until the desired function is located (sections 4.2-4.6). Then type the Control Code or Escape Sequence you desire to invoke the function, followed by simultaneous depression of the CTRL and RETURN keys, which causes the new definition to be added to the list of current definitions. Successful assignment will result in the display of the newly assigned Hex code sequence and sound the bell. If this does not occur then either there is insufficient EAROM memory available (Check upper right portion of. the screen for the # of bytes available) or the code is already defined. The number of functions is displayed to the left of the words: 'AVAILABLE FUNCTIONS'.

CUSTOM MODE SET-UP 3   EMULATION: ACT-5A   EAROM BYTES LEFT: **94**

TO EXIT PRESS "SET-UP"

153 AVAILABLE FUNCTIONS ASSIGNMENT:

Use "CTRL RETURN" to assign FUNCTION: **#1 NOP**
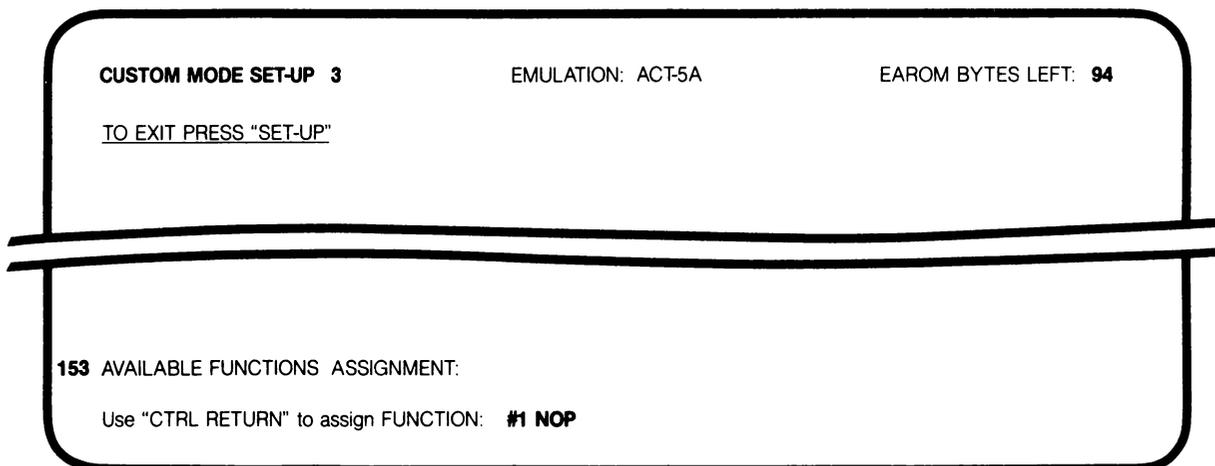
FIGURE 3.2.3

Table 3.1.1 lists Control Codes and the key combinations to generate the codes.

NOTES:
To define the 'ESCAPE' Control Code type the CTRL and 'C' keys simultaneously.

For Custom Mode Definitions an Escape Sequence is defined as a two character code sequence of which the first code is always ESCAPE (1B Hex) and the second code represents a displayable character (i.e. an alphabetic, numeric or symbol key). Control Codes are not allowed as the second character of an Escape Sequence in Custom Mode SET-UP.

To verify the new definitions depress the 5/% key two or three times to bring up the CUSTOMIZED CONTROL CODES or CUSTOMIZED ESCAPE SEQUENCES display, respectively.

To return to SET-UP A from Custom Mode SET-UP depress the SET-UP key.

To save the new Custom Mode Definitions perform a SAVE operation as described in Section 2.5.7.

| CUSTOM MODE SET-UP 4 | EMULATION: ACT-5A | EAROM BYTES LEFT: 94 |

TO EXIT PRESS "SET-UP"

1█████   2████   3█████   4█████
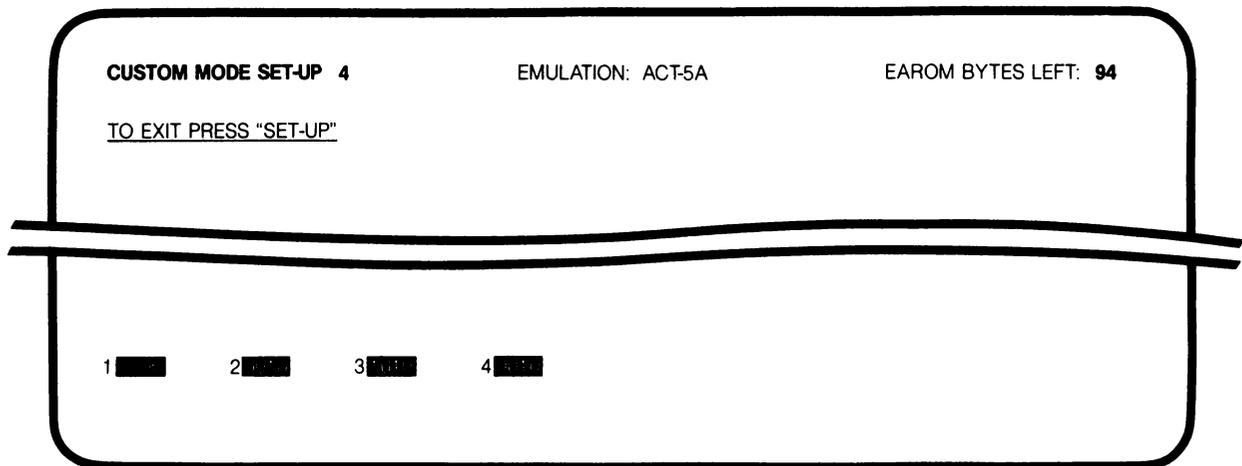
FIGURE 3.3.1A

3.3 Custom SET-UP Mode 4

Custom SET-UP Mode 4 contains switches for emulation dependent
functions. Whenever the base emulation (ACT-5A, ADM 3A, VT52, or
925) is changed, all 16 programmable switches and the 15 editing
key definitions of SET-UP mode 4 are automatically set for proper
emulation. Changes to these switches may result in less than per-
fect emulations and customized software on the host may be
required to obtain the desired system results.

3.3.1 Programmable Edit Keys

The code sequences transmitted by the 15 Editing Keys may be
redefined in Custom SET-UP Mode 4 to be either one control code,
or a two character Escape Sequence of which the first code is
always Escape and the second code a displayable character.

To display the current assignment, depress the CTRL and the
desired Editing Key simultaneously. To redefine the key, type
any character to serve as a delimiter, followed by the new con-
trol code or two character Escape Sequence. The second charac-
ter of an Escape Sequence must be a displayable character (A
control code will not be accepted). To abort at this point
without changing the old key definition, type either the SET-UP
key, or the CTRL key and an Editing Key. To assign the new code
sequence, type the delimiter character again. The bell will
ring to acknowledge acceptance of the new code sequence, and the
definition display will be cleared.

3.3.2 Custom SET-UP 4 Switches - Group 1

3.3.3 Auto-Repeat

When enabled (Switch = 1), this feature allows the key to
automatically repeat at about 30 characters per second after the
key has been held down for more than one half second. The fol-
lowing keys do not auto repeat: SET-UP, BREAK, NO SCROLL, TAB,
RETURN,ENTER, and any other key when CTRL is depressed.

3.3.4 Wrap-Around

When enabled (Switch = 1), an attempt to overfill a line will
cause the offending character to be placed at the first position
on the next line down. If the switch equals 0, any attempt to
overfill a line will cause the character to override the right-
most display position of the same line.

3.3.5 Newline

When the NEW LINE mode is selected (Switch = 1), depression of
the RETURN Key will cause the codes for carriage return (CR) and
line feed (LF) to be transmitted. When a line feed code is
received, a carriage return and line feed function are per-
formed. When the new line mode is reset (Switch = 0), the

RETURN Key transmits only carriage return, and the receipt of the line feed code causes only the line feed function to be performed.

3.3.6 Auto-Page

When a second page of memory is installed, the current emulation is 925 and this feature is selected (Switch =1), the terminal will automatically advance the page under certain conditions. (See Section 4.5 #90, #96)

3.4 Custom SET-UP 4 Switches - Group 2

3.4.1 Protocol

The ERGO 201 may be configured for XON/XOFF, DTR or no protocol.

When XON/XOFF protocol is selected (Switch = 1) and the AUTO-PROTOCOL feature (3.4.2) is enabled, The ERGO 201 will transmit XOFF (Hex 13) to the host when the terminal becomes busy and XON (Hex 11) when the 201 is again ready to receive data from the host. See sections 3.4.2 and 3.8.2 for technical details. Conversely, the ERGO 201 will suspend transmission of data to the host whenever an XOFF (Hex 13) is received, and will resume transmission whenever an XON (Hex 11) is received. The DTR line (Pin 20 of the I/O connector) is high whenever the terminal is on and XON/XOFF protocol is selected.

When DTR protocol is selected (Switch = 0) and the AUTO-PROTOCOL feature is enabled, the ERGO 201 will raise the DTR line when the terminal is ready to receive data, and will lower the line when the terminal is busy.

Note that is DTR protocol is selected and the AUTO-PROTOCOL feature is disabled there is in effect NO PROTOCOL.

3.4.2 Auto Protocol

If XON/XOFF Protocol is selected, then the selection of Auto Protocol enables the ERGO 201 to automatically send the synchronizing codes XOFF and XON to suspend and continue transmission from the host. Since proper operation of this feature requires timely cooperation from the host, be sure that the XON/XOFF protocol is supported by the host. When AUTO PROTOCOL is enabled (Switch = 1) and XON/XOFF protocol is selected the ERGO 201 will send XOFF in any of the following circumstances:

1. The internal buffer is nearly full;

2. The ERGO 201 is placed in SET-UP Mode;

3. CTRL S is typed.

XON is automatically transmitted when the buffer empties, an exit is made from SET-UP Mode, CTRL Q is typed. See Section 3.8.2 for information on XON/XOFF Protocol.

When the auto protocol feature is not enabled (Switch equals 0), XOFF and XON will only be transmitted when the operator types CTRL S and CTRL Q.

If DTR Protocol is selected and Auto-Protocol is enabled the terminal will lower the DTR line in any of the circumstances described above that would cause XOFF to be sent (except for the operator typing CTRL S). Similarly, the DTR line would be raised in response to the same conditions that would result in the transmission of XON above. (except for the operator typing CTRL Q).

3.4.3 XON/XOFF From Host

When XON/XOFF protocol is selected the terminal will treat the XOFF character (Hex 13) from the host as a channel control command if this switch equals 1. If this feature is disabled (Switch = 0), XOFF (Hex 13) characters from the host will be treated as data.

3.4.4 Printer => Host

When enabled (Switch = 1), the ERGO 201 printer port becomes bidirectional and will route all data received from the printer port to the host. When disabled (Switch = 0), all data from the printer except XON and XOFF will be ignored. This feature is used when the printer contains a keyboard and the operator desires to communicate to the host from the printer.

NOTE: XON and XOFF are not passed directly through the 201 to the host when received from the printer. Instead, the ERGO 201 uses XOFF from the printer as a "busy" signal and suspends transmission to the printer. The 201 then fills its own buffer to capacity before sending XOFF to the host (protocol = XON/XOFF and AUTO-PROTOCOL enabled). If the printer subsequently sends XON (printer ready) to the 201 before the 201's buffer fills, no XOFF will ever be sent to the host.

3.5 Custom SET-UP 4 Switches - Group 3

3.5.1 Send Range

When this switch equals 1, a SEND operation will send all data on the current line or page, depending on the setting of the SEND KEY: Block/Extent and SEND EXTENT switches in SET-UP C. When this switch equals 0, a SEND operation will transmit data up to and including the current cursor position.

3.5.2 Print Range

When this switch equals 1, a PRINT operation will print all data on the current line or page, depending on the setting of the PRINT KEY: Block/Extent and PRINT EXTENT switches in SET-UP C. When this switch equals 0, a PRINT operation will print data up to and including the current cursor position.

3.5.3 925 Attributes

In the 925 emulation mode video attributes use a character space on the screen to define an attribute field. This switch determines the extent of the field: when the switch equals 1 the field extends to the next attribute definition character on the screen or the bottom of the screen, whichever comes first; When the switch equals 0, the attribute field extends to next attribute definition character on the screen or to the end of the line, whichever comes first.

3.6 Custom SET-UP 4 Switches - Group 4

3.6.1 Protected Attributes

The fourth switch in group 3 and all four switches in group four determine the protected attributes. When the switch equals 1 the indicated video attribute will be treated as a protected field wherever it occurs on the screen, whether alone or in combination with other attributes.

NOTE: In the 925 emulation the protected attribute is always HALF INTENSITY and the ERGO 201 will not allow the operator to change the protected attribute.

AUTOREPEAT: { 1 = ENABLE / 0 = DISABLED

WRAP-AROUND: { 1 = ENABLE / 0 = DISABLED

NEWLINE: { 1 = ENABLE / 0 = DISABLED

AUTO PAGE: { 1 = ENABLE / 0 = DISABLED

SEND: { 1 = FULL EXTENT / 0 = TO CURSOR

PRINT: { 1 = FULL EXTENT / 0 = TO CURSOR

925 ATTRIBUTES: { 1 = PAGE / 0 = LINE

BLANK PROTECTED: { 1 = ENABLE / 0 = DISABLED

1 [ ] [ ] [ ] [ ]   2 [ ] [ ] [ ] [ ]   3 [ ] [ ] [ ] [ ]   4 [ ] [ ] [ ] [ ]

PRINTER → HOST: { 1 = ENABLE / 0 = DISABLED

XON-XOFF FROM HOST: { 1 = PROTOCOL / 0 = DATA

AUTOPROTOCOL: { 1 = ENABLE / 0 = DISABLED

PROTOCOL: { 1 = XON-XOFF / 0 = DTR

UNDERLINE PROTECTED: { 1 = ENABLE / 0 = DISABLED

REVERSE PROTECTED: { 1 = ENABLE / 0 = DISABLED

BLINK PROTECTED: { 1 = ENABLE / 0 = DISABLED

HALF PROTECTED: { 1 = ENABLE / 0 = DISABLED

FIGURE 3.3.1 B

3.7 Reserved

3.8 System Response: Modes, Protocol, Etc.

3.8.1 Keyboard Disable

The operator may restrict keyboard transmission by disabling the auto-repeat feature by means of a switch in Custom SET-UP 4, or by disabling transmission completely from the ERGO 201 with the XOFF control code. While disabled from transmitting, the ERGO 201 may still send the synchronizing codes XON and XOFF to the host as necessary. Although no characters will be transmitted from the keyboard, up to six characters may be buffered. When the buffer fills, further keyboard activity will be ignored.

The keyboard will unlock when transmission to the host is resumed due to receipt of XON code and subsequent emptying of the keyboard buffer, or due to entering SET-UP Mode. The SET-UP key, since it functions locally, is not disabled when the key-board is locked. Entering SET-UP clears the keyboard buffer immediately. The keyboard buffer may fill even when the host has not sent XOFF if the operator is typing faster than the channel capacity. This circumstance is probable only when the transmis-sion rate is 75 baud.

Note that if XON and XOFF are not to used as channel control commands to the ERGO 201, then the Protocol Select bit in Custom SET-UP 4 must be set for DTR protocol (section 3.4.1).

3.8.2 XON/XOFF Protocol

The ERGO 201 can receive data at speeds up to 19,200 baud. Since some control sequences cannot be executed as quickly as they may be received, the incoming data is buffered and processed on a first in first out basis. To prevent the possibility of buffer overflow, the ERGO 201 sends XOFF to the host when the 256 char-acter buffer becomes half full, and then sends XON when only 32 characters remain in the buffer if the auto protocol feature has been enabled. The host must promptly suspend transmission upon receipt of XOFF until XON is received. To calculate the maximum time available to the host to suspend transmission, use the fol-lowing formulas:

Number of Characters to Overflow:

N = 128 - [3 x (receive/transmit speed)]

Time to Respond to XOFF:

N x (bits/character + x + y)/receive speed

Where x = 0 parity disabled; 1: parity enabled

Where y = the number of stop bits selected + 1 (2 or 3)

This is a worst case calculation. Some additional time is available to the host as characters are removed from the buffer and processed. For a quick calculation, the time to respond to XOFF can be approximated to within a factor of 2 by 1,000/receive speed (Seconds). For example, at 19,200 baud, the host should respond within 50 milliseconds.

If DTR protocol is selected and the Auto-Protocol feature is enabled the terminal will lower the DTR line (Pin 19, 20 of the IO connector) when the buffer becomes half full, and raise the DTR line when only 32 characters remain in the buffer. The host must suspend transmission until the DTR line is raised.

Software which does not support either XON/XOFF or DTR protocol can still use the ERGO 201. The user is cautioned, however, that the printer port, smooth scroll, and SET-UP entry and exit depend heavily upon XON/XOFF or DTR protocol to function properly under all circumstances. While these functions may be used without protocol, extreme care must be exercised to insure no loss of data.

3.8.3 Special Graphics

When "Special Graphics" character set is selected, the display representation for the hex codes 5F through 7E will appear according to table 3.8.1.

⌐ Upper Right Corner	p · Centered Dots - Scan Line 3,4
⌐ Lower Right Corner	q · Centered Dots - Scan line 5,6
⌐ Upper Right Corner	r ' Centered Dots - Scan Line 7,8
∟ Lower Left Corner	s ' Centered Dots - Scan Line 9,10
+ Crossing Lines	t Centered Dots - Scan Line 11,12
├ Left "T"	u ■ Horiz. Line - Scan 1 to 12
┤ Right "T"	v ■ Horiz. Line - Scan 1 to 9
┴ Bottom "T"	w ■ Horiz. Line - Scan 1 to 6
┬ Top "T"	x ▬ Horiz. Line - Scan 1 to 3
≤ Less Than/Equal To	y ▬ Horiz. Line - Scan 1 to 10
≥ Greater Than/Equal To	z Horiz. Line - Scan 12
π Pi	{ ⁻ Horiz. Line - Scan 9
≠ Not Equal To	¦ ⁻ Horiz. Line -Scan 6
° Degree Symbol	} ⁻ Horiz. Line -Scan 3
± Plus/Minus	∿ ¦ Vert. Bar
. Centered Dots - Scan Line 1,2	▓ Checkerboard

TABLE 3.8.1

4. FUNCTION DEFINITIONS and EMULATION/MODE IMPLICATIONS.

This section describes in detail each function supported in the ERGO 201. The functions are listed in the same order as they appear on the screen in CUSTOM MODE SET-UP 3 and are referenced by the same function numbers. The order chosen is alphabetical, and all functions of one emulation are described before those of other emulations. The emulation order is:

> ACT-5A
> VT52
> ADM 3A
> 925
> Non-Standard Functions

Each function discusses the significant implications of its use with some other emulation mode. Cross references are given where additional information is necessary.

4.1 BASE EMULATION CHARACTERISTICS

The 201 response to control codes and escape sequences can be modified from a standard base emulation (ACT-5A, ADM 3A, VT52, or 925) to enhance system performance, security, or to protect varied terminal dependent software investments. When customizing the 201, the system manager should choose the standard base emulation which most closely defaults to the desired product. Control codes and escape sequences for any function may then be carefully added or removed (NOPped). Functions which are likely to yield unexpected results when used in combination with a particular base emulation are so annotated. The system manager must take particular care that the choice of base emulation which largely determines how the PRINT (4.7), SEND (4.8), and ATTRIBUTE (only the 925 base emulation requires a character space for an attribute definition) related functions will perform is consistent with any added functions.

4.2 ACT-5A FUNCTIONS

(1) No Operation.

This function can be used to nullify the meaning of any standard emulation command. The command which is defined to be a no operation will be ignored by the terminal. For example, if it were desired to eliminate the BELL command, without reassigning the bell code (07H) to any other operation, then the No Operation function (#1) should be assigned to CNTRL G (07H) in custom mode 4. After the customization is adopted, any bell command (07H) from the host would be ignored. Note that the No Operation function can be assigned to effectively disable any number of standard emulation control codes or escape sequences. All other functions can be assigned to maximum of 5 control code and/or escape sequences.

(2) **Background Follows.**

The Intensity Video attribute is set to Half Intensity. All the subsequently received displayable characters will have this video attribute set. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen.

(3) **Back Space (Cursor Left).**

This function moves the cursor one character position to the left. When attempting to move the cursor beyond the left margin, the cursor will stop at the left margin. In ACT-5A, VT52, or ADM 3A style emulations any attempt to backspace into a protected field while in Protect Mode, will cause the cursor to remain in the same position.

(4) **Bell.**

This function sounds the bell tone.

(5) **Carriage Return.**

This function moves the cursor to the left margin on the current line. In ACT-5A, VT52, or ADM 3A style emulations any attempt to enter a protected left margin while in Protect Mode, will move the cursor to the first unprotected position on the same line (or the next line if the New Line switch is enabled).

(6) **Change Intensity.**

This function toggles the Intensity attribute from Full to Half and vice versa. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. All the subsequently received displayable characters will have the new intensity attribute set.

(7) **Clear Unprotected.**

When not in Protect Mode, this function causes all characters on the screen to be cleared to current clear character with the unprotected attributes in effect. The unprotected attributes are obtained by masking off the current protected attributes from the current video attributes . The cursor is moved to the HOME (upper left) position.

When in Protect Mode, only the unprotected characters on the screen are cleared. In ACT-5A, VT52, or ADM 3A style emulations the cursor is moved to the first unprotected position on the screen.

(8) **ACT-5A Cursor Addressing.**

This function causes the cursor to be moved to the specified line and column. The general format is a lead-in code, followed by the 2 encoded characters which represent the row and column numbers. Appendix 6.2 lists the valid ASCII codes for the row and column numbers. In ACT-5A, VT52, or ADM 3A style emulations, while in Protect Mode, an attempt to position the cursor into a protected field will cause the cursor to be positioned at the first unprotected position following the commanded address.

(9) Cursor Down.

This function moves the cursor downward one position without altering the horizontal position. When attempting to move the cursor below the bottom of the scrolling window in effect, the cursor stops at the bottom of the scrolling window. When the cursor is below the scrolling window, any attempt to move the cursor below the bottom of the screen will stop the cursor at the bottom row. The default scrolling window spans the entire screen.

When in Protect Mode, this function is affected by the type of emulation in effect. In ACT-5A, VT52, or ADM 3A style emulation any attempt to move the cursor into a protected field will move the cursor to the first unprotected position following the expected position on the next line where the cursor would have been without Protect Mode. In 925 style emulation the cursor can be moved into a protected field using the cursor down function.

(10) Cursor Right.

This function moves the cursor one character position to the right. When attempting to move the cursor beyond the right margin, the cursor stops at the right margin. In ACT-5A, VT52, or ADM 3A style emulations, if an attempt is made to move the cursor into a protected field while in Protect Mode, the cursor will not move.

(11) Cursor Up.

The cursor up sequence moves the cursor upward one position without altering the horizontal position. When attempting to move the cursor above the top of the scrolling window in effect, the cursor stops at the top of the scrolling window. When the cursor is above the scrolling window, any attempt to move the cursor above the top margin will stop the cursor at the top margin. The default scrolling window spans the entire screen.

When in Protect Mode, this function is affected by the type of emulation in effect. In ACT-5A, VT52, or ADM 3A style emulation, any attempt to move the cursor into a protected field will move the cursor to the first unprotected position. In

ACT-5A, VT52, or ADM 3A style emulation any attempt to move the cursor into a protected field will move the cursor to the first unprotected position following the expected position on the previous line where the cursor would have been without Protect Mode. In 925 style emulation the cursor can be moved into a protected field using the cursor up function.

(12) **Delete Character.**

The character at the current cursor position is deleted. All characters to the right of the cursor up to the right margin are moved to the left one position and the last character position is cleared to clear character with the video attributes of the last character on the line.

When in Protect Mode, the effects of the sequence are field limited if the field ends before right margin, and line limited otherwise. If the cursor is in a protected field, the function has no effect.

(13) **Delete Line.**

The line containing the cursor is deleted from the display. Only lines within the scrolling region can be deleted. Undeleted lines below the cursor are moved up to occupy the deleted row space. The line at the bottom of the scrolling window is cleared to clear character with the present video attributes.

When in Protect Mode, the effects of the sequence are limited to the current unprotected field. If the cursor row has a protected field, then the function has no effect. If the current unprotected field goes beyond the bottom of the window, the function is limited to act within the scrolling window.

(14) **Disable Cursor.**

This function turns off the display of cursor.

(15) **Disable Key click.**

This function disables the generation of audible clicks when encoded keys are struck at the keyboard.

(16) **Disable Scroll.**

The effect of this function will be to stop scrolling the display up or down. Line feed codes received at the bottom of the scrolling window will cause the cursor to wrap to the top of the scrolling window. Similarly, Reverse Line feeds at the top of the window will move the cursor to the bottom of the window.

(17) **Disable Smooth Scroll.**

This sequence causes the display to "jump" instantaneously when scrolling (eg. performing a linefeed function when the cursor was at the bottom of the scrolling region.

(18) **Disable Wrap Around.**

This function causes any displayable characters received when the cursor is at the right margin to replace any previous characters there.

(19) **Enable Cursor.**

This function enables the display of the cursor on the screen.

(20) **Enable Key click.**

This function enables the generation of audible key clicks when encoded keys are struck at the keyboard.

(21) **Enable Scroll.**

This function allows the display to scroll up or down. Line feed codes received at the bottom of the scrolling window will cause the display to scroll up. Likewise, execution of the Reverse Line Feed function with the cursor at the top of the window will perform a scroll down.

(22) **Enable Smooth Scroll.**

This function causes the scroll to be "smooth" at a maximum rate of six or twelve lines per second (section 2.9.3).

(23) **Enable Wrap Around.**

This function causes the cursor to advance to the start of the next line, doing a scroll up if required and permitted, after displaying a character on the screen at the right margin. When the cursor is below the scrolling window, after displaying a character at the last position on the screen it will wrap to the beginning of the same row.

(24) **End Blink Field.**

The Blink video attribute is reset. All the subsequently received displayable characters will not blink. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function cannot be used with 925 style emulation.

(25) **End Reverse Video Field.**

The Reverse video attribute is reset. All the subsequently received displayable characters will be in normal video. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function cannot be used with 925 style emulation.

(26) End Underline Field.

The Underline video attribute is reset. All the subsequently received displayable characters will not be underlined. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function cannot be used with 925 style emulation.

(27) Enter Graphics Mode.

This function enables the special graphics character set to be used. All ASCII codes in the range of 5EH to 7EH are mapped to display the special graphics characters. Table 3.8.1 lists the characters displayed.

(28) Enter Insert Character Mode.

This function places the ERGO 201 in insert character mode and lights the INSERT lamp. While the insertion mode is active, all received characters are placed at the cursor position, all characters from the cursor to the right margin are shifted to the right by one character, and the rightmost character is lost. The mode is exited when the cursor inserts a character at the right margin, or when a control code is processed by the terminal. The control codes include all those received from the host and user generated control codes such as the editing keys with the Local/Duplex switch set for Local (2.16.3), the RUBOUT function in local and block modes, PRINT and SEND functions in block modes, and the SETUP key. When the insert character mode is exited, the INSERT lamp is turned off.

When in Protect Mode, the effects of the sequence are field limited if the field ends before right margin, and line limited otherwise. If the cursor is in a protected field, the command has no effect.

(29) Enter Monitored Printer Mode.

Monitored printer mode causes all subsequent data received by the terminal to be sent to the printer and processed at the terminal. If no printer is attached, or the printer is not ready and was not ready when the unit was powered up, the monitored printer mode is ignored. No characters of the command to exit the monitored printer mode are passed to the printer. If the monitored printer mode is entered, it must be terminated before selecting another print mode or issuing any other print command.

(30) **Enter Non-Monitored Printer Mode.**

Non-Monitored printer mode causes all subsequent data received by the terminal to be sent to the printer without being displayed. If no printer is attached, or the printer is not ready and was not ready when the unit was powered up, the Enter Non-Monitored Printer Mode function is ignored. No characters of the command to exit the non-monitored printer mode are passed to the printer. If the non-monitored printer mode is entered, it must be terminated before selecting another print mode or issuing any other print command.

(31) **Enter Protect Mode.**

Placing the terminal in Protect Mode prevents the cursor from entering the protected fields. When the mode is entered, the cursor position and the scrolling status are not affected. Only the scrolling commands can affect the protected fields if scrolling is enabled. No other ACT-5A, VT52, or ADM 3A command can move the cursor into a protected field or modify a protected field. The editing functions cannot alter the protected fields. Displayable characters can be entered only in unprotected fields. If the entire screen is protected, the cursor stays at HOME Position.

(32) **Erase to End Of the Screen with Protected Attributes.**

All characters from the cursor position to the end of the screen are erased (i.e. replaced by the currently defined clear character). The attributes of each erased character are the currently selected attributes excluding those which are also currently defined as protected. For example, if the currently selected attributes are blink, reverse, and half intensity while blink and half intensity are defined to be protected, then the erased characters will have only the reverse attribute. The cursor position is not affected.

When in Protect Mode, only the unprotected fields from the cursor position to the end of the screen are cleared. In ACT-5A, VT52, or ADM 3A style emulations, if the current cursor position is protected, it moves forward to the first unprotected position.

(33) **Erase Cursor to End Of Screen with Unprotected Attributes.**

All characters from the cursor position to the end of the screen are erased (i.e. replaced by the currently defined clear character). The attributes of each erased character are the currently selected attributes excluding those which are also currently defined as protected. For example, if the currently selected attributes are blink, reverse, and half intensity while blink and half intensity are defined to be protected, then the erased characters will have only the reverse attribute. The cursor position is not affected.

When in Protect Mode, only the unprotected fields from the cursor position to the end of the screen are cleared. In ACT-5A, VT52, or ADM 3A style emulations if the current cursor position is protected, it moves forward to the first unprotected position.

(34) Erase Cursor to End Of the Screen with Current Attributes.

All characters from the cursor position to the end of the screen are erased to the clear character with the current video attributes. The cursor position is not affected.

When in Protect Mode, only the unprotected fields from the cursor position to the end of the screen are cleared. In ACT-5A, VT52, or ADM 3A style emulations if the current cursor position is protected, it moves forward to the first unprotected position.

(35) Erase Cursor to End Of Line with Protected Attributes.

All characters from the cursor position to the end of the current line are erased to the clear character with the present protected attributes. The cursor position is not affected.

When in Protect Mode, only the current unprotected field in the current line from the cursor position to the end of the field is cleared. If the field goes beyond the right margin, the function is limited to the end of the line. If the cursor is in a protected field, then the first unprotected field following the cursor position in the same line, if any, is cleared. The cursor moves forward to the first unprotected position if in ACT-5A, VT52, or ADM 3A style emulations.

(36) Erase Cursor to End Of Line with Unprotected Attributes.

All characters from the cursor position to the end of the current line are erased
(i.e. replaced by the currently defined clear character). The attributes of each erased character are the currently selected attributes excluding those which are also currently defined as protected. For example, if the currently selected attributes are blink, reverse, and half intensity while blink and half intensity are defined to be protected, then the erased characters will have only the reverse attribute. The cursor position is not affected.

When in Protect Mode, only the current unprotected field in the current line from cursor position to the end the field is cleared. If the field goes beyond the right margin, the function is limited to the end of the line. If the cursor is in a protected field the first unprotected field following the cursor position in the same line if any, is cleared. The cursor moves forward to the first unprotected position if in ACT-5A, VT52, or ADM 3A style emulations.

(37) **Erase Cursor to End Of Line with Current Attributes.**

All characters from the cursor position to the end of the current line are erased to the clear character with the present attributes. The cursor position is not affected.

When in Protect Mode, only the current unprotected field in the current line from cursor position to the end the field is cleared. If the field goes beyond the right margin, the function is limited to the end of the line. If the cursor is in a protected field the first unprotected field following the cursor position in the same line if any, is cleared. The cursor moves forward to the first unprotected position if in ACT-5A, VT52, or ADM 3A style emulations.

(38) **Exit Graphics Mode.**

This command enables the standard ASCII character set to be used.

(39) **Exit Monitored Printer Mode.**

This command is not passed to the printer. Instead it causes the terminal to exit the monitored printer mode. The PRINTER PORT lamp is turned off.

NOTE:

Although up to 5 codes can be assigned to this function in addition to the standard code and all will exit the Monitored Printer Mode, only one code will not be passed to the printer before the Monitored Printer Mode is exited. This primary code will be the first custom code found to be assigned to this function. The first code is chosen by alphabetically searching for a custom code assigned to this function. This search is conducted by scanning the Control codes first and then the Escape sequences for a code assigned to the Exit Monitored Printer Mode function. The "primary code" cannot be the standard code if any custom codes have been assigned to this function.

(40) **Exit Non-Monitored Printer Mode.**

While in Non-Monitored Printer Mode, the terminal will pass all data except the exit code to the printer. No other codes are processed until the mode is exited. The PRINTER PORT lamp is turned off.

NOTE:

Although up to 5 codes can be assigned to this function in addition to the standard code only one will actually exit the Non-Monitored Printer Mode. This primary code will be the first custom code found to be assigned to this function. The

first code is chosen by alphabetically searching for a custom code assigned to this function. This search is conducted by scanning the Control codes first and then the Escape sequences for a code assigned to the Exit Non-Monitored Printer Mode function. The "primary code" cannot be the standard code if any custom codes have been assigned to this function.

(41) **Exit Protect Mode.**

Exiting the Protect Mode allows unrestricted movement of the cursor. The current protect attributes have no special meaning when not in Protect Mode. The PROTECTED MODE lamp is turned off.

(42) **Foreground (Full Intensity) Follows.**

The Intensity Video attribute is set to Full Intensity. All the subsequently received displayable characters will be displayed in full intensity. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen.

(43) **Home.**

This command moves the cursor to the HOME position on the screen. This will be the first column position in the first row.

When in Protect Mode and if the HOME position is protected, the cursor will move to the first unprotected position if in ACT-5A, VT52, or ADM 3A style emulations. If the base emulation is 925, the cursor will stay in the protected HOME position.

(44) **Home and Clear with Current Attributes.**

All characters on the screen are cleared to the clear character with the current video attributes. The cursor is moved to the HOME position.

When in protected mode, all the unprotected fields on the screen are cleared. If the home position is protected, in ACT-5A, VT52, or ADM 3A emulations, the cursor will move to the first unprotected position.

(45) **Home and Clear with Protected Attributes.**

All characters on the screen are cleared to the clear character with the present protected video attributes. The cursor is moved to the HOME position.

When in protected mode, all the unprotected fields on the screen are cleared. If the home position is protected, in ACT-5A, VT52, or ADM 3A emulations, the cursor will move to the first unprotected position.

(46) **Home and Clear with Unprotected Attributes.**

All characters on the screen are cleared to the clear character with the present unprotected video attributes. The unprotected attributes are obtained by masking off the current protected attributes from the current video attributes. The cursor is moved to the HOME position.

When in protected mode, all the unprotected fields on the screen are cleared. If the home position is protected, in ACT-5A, VT52, or ADM 3A emulations, the cursor will move to the first unprotected position. If the base emulation is 925, the cursor will stay in the protected HOME position.

(47) **Insert Line.**

A blank line is inserted before the line containing the cursor. Only lines within the scrolling region can be affected. The cursor line and those which are below it and within the window are moved down one row to create the space for the inserted line which will be cleared to the clear character with the current attributes. The last line in the scrolling window is lost. The cursor position is not affected.

When in Protect Mode, the effects of the sequence are limited to the current unprotected field. All lines from the cursor line to the last unprotected line in the field are moved down one line within the field. The last unprotected line in the current field will be lost. If the current unprotected field goes beyond the bottom of the scrolling window, the command is limited to within the window. If the cursor row has a protected field, then the command has no effect.

(48) **Line feed.**

This function moves the cursor downward one position without affecting the column position. If the cursor is at the bottom of the window a scroll up is performed if scrolling is enabled; otherwise, the cursor wraps to the top of the scrolling window. If the cursor is below the window, and on the last row, the cursor will not move. If NEW LINE mode is set (see section), the function will perform Carriage Return and Line feed operations.

When in 925 emulation, the function works in a very similar manner if a non default scrolling window is defined. When the scrolling window spans all rows (1-24) of the screen, scrolling is enabled, and the Auto Page Mode is enabled, a line feed at the bottom of the scrolling window will cause the display of the other page with the cursor at the top row, same column.

(49) **Print Line.**

The print operation starts at the beginning of the cursor line. The extent of the print operation depends on the PRINT range switch in CUSTOM MODE SET-UP 4 which determines whether the operation terminates at the cursor position or the end of the line. The cursor position is not affected. For details of print operation, please refer to section 4.7.

(50) **Print Page.**

The print operation starts at HOME position. The extent of the print operation depends on the PRINT range switch in CUSTOM MODE SET-UP 4 which determines whether the operation terminates at the cursor position or the end of the screen. The cursor position is not affected. For details of print operation, please refer to section 4.7.

(51) **Report Character At Cursor.**

The character at the current cursor position is reported to the host followed by the programmable send EOT character (see function #59), if defined. The report is not echoed on the terminal screen. If the terminal is in local mode, the function is ignored.

(52) **Report Cursor Position.**

In response to this function the active (cursor) position of the terminal is reported by means of two numeric parameters, the first specifying the line and the second specifying the column.

The line number is in the range of 0 to 23; and the column number is in the range of 0 to 79.

The programmable send EOT characters follow the report if these are defined. The report is not echoed on the screen. The function is ignored in local mode.

(53) **Report Product Code.**

This function invokes a response from the terminal to identify the unit as an ERGO 201. ASCII "B" (42H) is sent to the host. The report is not echoed on the screen. The function is ignored in local mode.

(54) **Report Video Attributes.**

The video attributes of the character at the cursor position is reported as a displayable ASCII character in the range of 40H to 5FH. The programmable send EOT characters follow the report if these are defined. The report is not echoed on the screen. The function is ignored in local mode. The ASCII characters sent for various attributes are listed in table 4.2.1

(55) Reverse Line Feed.

This function moves the cursor upward one position without affecting the column position. If the cursor is at the top of the scrolling window, a scroll down is performed if scrolling is enabled; otherwise, the cursor wraps to the bottom of the scrolling window. If the cursor is above the scrolling window, and on the first row, the cursor will not move.

When in 925 emulation, if the scrolling window spans all rows (1-24) of the screen, scrolling is enabled, and if the Auto Page Mode is enabled, a reverse line feed at the top of the scrolling window of the second page will cause the display of the first page, with the cursor at the bottom row same column.

(56) Reverse Tab.

This function moves the cursor to the previous tab stop. If the cursor is on or to the left of the first (leftmost) tab stop, the cursor does not move.

When in Protect Mode, moves the cursor to the beginning of the previous unprotected field. If the cursor is inside an unprotected field but not at the beginning of it, then the cursor moves to the beginning of the current unprotected field. If no previous protected field is found until the top of the scrolling window or HOME position, whichever comes first, then the cursor moves to the HOME position.

(57) Set Send Data Type, All.

This function selects both Protected and Unprotected data to be sent during a SEND operation. See also section 4.8

(58) Set Send Data Type, Unprotected Only.

This function selects only unprotected data to be sent during a SEND operation. See also section 4.8

(59) Set Send Termination Character.

This function selects one character to be programmed which will be sent at the end of following reports.

> Report Character at Cursor.
> Report Cursor Position.
> Report Video Attributes.
> Block Send Operation: ACT-5A style.

This function has the same effect as the function Select Send EOT Character (section 4.5 #124) except that this will allow only one character to be programmed. This function is provided to be compatible with the ACT-5A function Set End Of Block Character. Note that when this function is used, the previous

programmed characters are lost.

(60) **Set Video Attributes.**

This function enables the graphic rendition as specified by the parameter. All characters transmitted to the terminal following the command are rendered according to the specified parameter until the next occurrence of a Set Video Attributes command or other video attribute modification command (i.e. End Blinking Field). Note that this function may not be used with Televideo 925 style emulation. Table 4.2.1 below lists the parameters and the parameter meanings. Note that only the low 5 bits of information in the ASCII character is required. This means, more than one ASCII character can define the same attribute combination.

TABLE 4.2.1   ACT-5A VIDEO ATTRIBUTES

ASCII CHARACTER	BLANK	NEW ATTRIBUTE SETTING			
		INTENSITY	BLINK	REVERSE	UNDERLINE
@	NO	FULL	NO	NO	NO
A	NO	FULL	NO	NO	YES
B	NO	FULL	NO	YES	NO
C	NO	FULL	NO	YES	YES
D	NO	FULL	YES	NO	NO
E	NO	FULL	YES	NO	YES
F	NO	FULL	YES	YES	NO
G	NO	FULL	YES	YES	YES
H	NO	HALF	NO	NO	NO
I	NO	HALF	NO	NO	YES
J	NO	HALF	NO	YES	NO
K	NO	HALF	NO	YES	YES
L	NO	HALF	YES	NO	NO
M	NO	HALF	YES	NO	YES
N	NO	HALF	YES	YES	NO
O	NO	HALF	YES	YES	YES
P	YES	FULL	NO	NO	NO
Q	YES	FULL	NO	NO	YES
R	YES	FULL	NO	YES	NO
S	YES	FULL	NO	YES	YES
T	YES	FULL	YES	NO	NO
U	YES	FULL	YES	NO	YES
V	YES	FULL	YES	YES	NO
W	YES	FULL	YES	YES	YES
X	YES	HALF	NO	NO	NO
Y	YES	HALF	NO	NO	YES
Z	YES	HALF	NO	YES	NO
[	YES	HALF	NO	YES	YES
\	YES	HALF	YES	NO	NO
]	YES	HALF	YES	NO	YES
^	YES	HALF	YES	YES	NO
_	YES	HALF	YES	YES	YES

(61) Start Blink Field.

The Blink video attribute is set. All the subsequently received displayable characters will blink. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function may not be used with the 925 base emulation.

(62) **Start Reverse Video Field.**

The Reverse video attribute is set. All the subsequently received displayable characters will appear in reverse video. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function may not be used with the 925 base emulation.

(63) **Start Underline Field.**

The Underline video attribute is set. All the subsequently received displayable characters will be underlined. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen. This function may not be used with the 925 base emulation.

(64) **Tab.**

This function moves the cursor to the next tab stop. If the cursor is at the last tab stop, it does not move. If the cursor is positioned to the right of the last programmed tab stop, the cursor will not move.

When in Protect Mode, this function moves the cursor to the beginning of the next unprotected field. If no protected field is found until the bottom of the scrolling window or the bottom of the screen, whichever comes first, then the cursor does not move.

(65) **Underline the Character at Cursor.**

The underline video attribute is added to the character displayed at the cursor position. The other video attributes are not affected. This function may not be used with the 925 base emulation.

4.3   VT52 FUNCTIONS.

(66) VT52 Cursor Addressing.

The next two bytes within the proper range which are received
by the 201 will be respectively interpreted as the new cursor
row and column positions. Valid data for rows 1-24 are byte
values 20H to 37H. Valid data for columns 1-80 are byte values
20H to 6FH. Bytes in the range 0-1FH are processed as the
appropriate control code and do not affect the cursor address-
ing sequence. An otherwise invalid data byte causes the old
value to be retained.

(67) Enter Alternate Key Pad mode.

When Alternate Key Pad Mode is asserted, the period (.),
"ENTER", and number keys of the numeric key pad send out a 3
code sequence as defined in table 3.1.2 rather than the single
code corresponding to the key cap legend. In block mode the
"ENTER" key still performs the "SEND" function (section 2.4.7).
Alternate Key Pad Mode is cleared when the 201 is powered up or
executes the command to "Exit Alternate Key Pad Mode", function
#70.

(68) Enter Auto-Print Mode.

Auto-Print Mode may be asserted if the printer DTR line was
high when the terminal was powered up or is high at the time
this command is executed. Otherwise, this command is ignored.
Once asserted, Auto-Print Mode causes each line of display to
be marked for printing whenever the "Line Feed" function (# 48)
is executed. Each marked line is automatically printed (sec-
tion 4.6) in sequence until the command to "Exit Auto Print
Mode" (# 71) is executed from the host, the operator depresses
"CNTRL ENTER/PRINT" (section 2.4.7), or if all printing is
aborted from SET-UP mode (section 2.5.6). Each printed line is
terminated by the programmable Print End Of Line Characters
(Function # 133).

(69) Enter Hold Screen Mode.

Hold Screen Mode allows the operator to easily control the rate
at which new data appears on the 201 display. With Hold Screen
Mode enabled, the ERGO 201 refuses to perform scrolls. If the
host commands it to scroll by sending the terminal a Line Feed
command, when the cursor is on the bottom line, the terminal
waits for the operator to tell it to scroll. Until such time,
all received characters will be kept in the input FIFO unpro-
cessed.

The operator tells the terminal that he is ready to see more
data. Depression of the NOSCROLL key causes one new line of
new data to be displayed; depression of SHIFT NOSCROLL allows

enough display lines to fill the scrolling window (normally 24). To exit Hold Screen Mode, the host must invoke function # 72.

It is clear that XON/XOFF or DTR protocol between the terminal and the host must be enabled, to allow the Hold Screen Mode to function properly. If the host does not respond to any proto-col, and continues to send more data, when the input FIFO is about full (238 characters) the terminal will abort Hold Screen Mode, perform the scroll, and exit the Hold Screen Mode to allow data to be processed rather than lost.

(70) **Exit Alternate Key Pad Mode.**

The numeric key pad will transmit the single standard code associated with the engraved legend when Alternate Key Pad mode is not enabled. See function # 67.

(71) **Exit Auto Print Mode.**

The ERGO 201 will exit the Auto Print Mode. i.e., it will not mark lines for automatic printing. The PRINT lamp is turned off. See function # 68.

(72) **Exit Hold Screen Mode.**

The 201 will scroll data from the display without operator intervention. See function # 69.

(73) **Identify Terminal.**

In response to this request, the ERGO 201 will transmit a three character sequence to the host. The sequence transmitted is:

ASCII	ESC	/	K
Hex	1B	2F	4B

Note that this identification implies that the terminal is a VT52 without copier. The report can be used with other emula-tions, as a general report.

The request is ignored in Local Mode. The report is not echoed on the screen.

4.4 ADM 3A FUNCTIONS.

(74) ADM 3A Cursor addressing.

The next two bytes received by the 201 will be respectively interpreted as the new cursor row and column positions. Valid data for rows 1-24 are byte values 20H to 37H. Valid data for columns 1-80 are byte values 20H to 6FH. Invalid byte data causes the old value to be retained.

(75) Lock Keyboard.

After this function is invoked, no keyboard characters are processed except SET-UP. The KEYBOARD LOCKED lamp is turned on. The keyboard is unlocked by entering SET-UP mode or if the Unlock Key Board command is received from the Host (function # 76).

(76) Unlock Keyboard.

This function unlocks the keyboard and allows characters from the key board to be processed. The KEYBOARD LOCKED lamp is turned off. See also Function # 75.

4.5 TELEVIDEO 925 FUNCTIONS.

(77) Advance Page.

If two pages of screen memory are installed, this function advances to the other page. The cursor assumes the last position previously occupied on that page.

(78) Back Page.

If two pages of screen memory are installed, and the second page is active, then this function causes the first page to be displayed. The cursor assumes the last position previously occupied on that page. The function has no effect, if the first page is active.

(79) Back Tab.

Moves the cursor to the previous tab stop, or to the left margin if no previous tab stops are present on the line.

When in Protect Mode, moves the cursor to the beginning of the previous unprotected field. If the cursor is inside an unprotected field, but not at the beginning of it, then the cursor moves to the beginning of the current unprotected field. If no previous protected field is found until the top of the scrolling window or HOME position, whichever comes first, then the cursor moves to the HOME position.

If the cursor was at HOME position, the search starts at the bottom of the screen.

If a scrolling window is defined to be other than the default (rows 1-24), then the Auto Page Mode has no effect. Otherwise, if Auto Page Mode is enabled, the search continues until the HOME position of page 1. If none found, the cursor moves forward to the first unprotected position if the search started on page 1. Otherwise, the cursor stops at the HOME position of page 1.

(80) Blank Screen.

This function blanks the screen display.

(81) 925 Carriage Return.

Moves cursor to the left margin on the current line.

While in Protect Mode and if the left margin position is protected, the cursor moves forward to the first unprotected position on the current page. If no unprotected position is found until the end of the screen, the search starts from the HOME position of the same page if Auto Page Mode is disabled, or the

next page if Auto Page Mode is enabled, and the cursor moves to the first unprotected position, if any.

Note the Auto Page Mode is discarded if a scrolling window other than the default value is defined.

(82) **Clear All Tabs.**

This function clears all tab stops.

(83) **Clear Column Tab.**

This function clears the tab stop, if any, at the cursor column.

(84) **Cursor Addressing: Page, Row, Column.**

This function moves the cursor to the specified page, row and column. The general format is a lead-in code followed by parameters for page , row and column. Section 6.2 lists the valid page, row and column coordinates.

(85) **925 Cursor Addressing: Row, Column.**

This function moves the cursor to the specified row and column on the current page. Section 6.2 lists the valid row and column coordinates.

(86) **925 Cursor Left.**

This function moves the cursor one character position to the left. When attempting to move the cursor beyond the left margin, the cursor moves to the right margin of the previous line.

When HOME position is encountered the cursor will not move if on the first pae of memory. When the cursor is at HOME position of the second page it does not move if Auto Page Mode is disabled; with the Auto Page Mode enabled, the first page of memory will be displayed, and the cursor moves to the last character position of the page.

While in Protect Mode, if the cursor position is protected, the cursor moves backwards to the first unprotected position. If none found until the HOME position, the cursor moves forward to the first unprotected position on the current page. If none found, the cursor does not move if Auto Page Mode is disabled; otherwise, the cursor searches the second page for an unprotected position.

Note the Auto Page Mode is discarded if a scrolling window other than the default value is defined.

(87) **925 Cursor Right.**

This function moves the cursor one character position to the right. When attempting to move the cursor beyond the right margin, the cursor moves to the left margin of the next line, performing a scroll up if required and permitted.

With the Auto Page Mode enabled, instead of scrolling up, the other page of memory is displayed and the cursor moves to the HOME position.

While in Protect Mode, if the cursor position is protected, the cursor moves forward to the first unprotected position. If none found, the search starts at HOME position of the same page if Auto Page Mode is disabled, or the other page with Auto Page Mode enabled. If none found, the cursor stays at HOME position of the current page.

Note the Auto Page Mode is discarded if a scrolling window other than the default value is defined.

(88) **925 Delete Line.**

The line containing the cursor is deleted from the display. Only lines within the scrolling region can be deleted. Undeleted lines below the cursor and within the scrolling window, are moved up to occupy the deleted row space. The line at the bottom of the scrolling window is cleared to clear character with the present video attributes.

In Protect Mode this function has no effect.

(89) **Disable 25th Line.**

This function turns off the display of 25th line.

(90) **Disable Auto Page.**

This function disables automatic page swapping. The various functions affected by this function are:

> Cursor Left
> Cursor Right
> Home
> Line feed
> New Line
> Reverse Line feed
> Reverse Tab
> Tab

Displayable characters in the 925 style emulation are also affected. For example, when the cursor is advanced past the right margin of the last row on the screen, the ERGO 201 will scroll up the display if permitted.

Note that if a scrolling window is defined, other than the default value, only the Advance Page, Back Page, and 925 cursor Addressing functions can be used to move the cursor to the other page. The default scrolling window spans the entire screen. See also Section

(97) **Enable Printer => Host.**

This function enables the bidirectional printer port. All subsequent data from the printer will be routed to the host. This feature is used when the printer contains a keyboard and the operator desires to communicate to the host from the printer. This feature is normally used in conjunction with Auto Print Mode or Non-Monitored Pass Through Printer Mode. This function has the same effect as setting the "Printer => Host" switch in SET-UP 4. See section 3.4.4 for technical details.

(98) **Enable Write Protect (Half Intensity).**

The Intensity video attribute is set to Half Intensity (Protected attribute). All the subsequently received displayable characters will be displayed in half intensity. The other video attributes are not affected. The change in the video attributes does not take up a character position on the screen.

Only the Intensity attribute can be directly controlled in the 925 style emulation. The other attributes are controlled by Set 925 Video Attributes function (# 136).

(99) **Enable XON-XOFF Protocol.**

This function selects XON/XOFF protocol, and enables the Auto Protocol feature.

(100) **Enter Block Mode.**

This function places the terminal in Block Mode. In Block Mode data will be received from the host, but data typed at the keyboard will displayed on the screen, and transmitted to the host only when a SEND operation is performed. Any query function will invoke a report which will not be echoed on the screen. The Edit Keys will either transmit or function locally, depending on the EDIT KEYS switch in SET-UP C.

(101) **Enter Conversational (On-Line) Mode**

This function places the terminal in the ON-LINE Mode. All data typed at the keyboard will transmitted to the host, and data from the host will be processed by the terminal. Any query function will invoke a report which will not be echoed on the screen. The Edit Keys will either transmit or function locally, depending on the EDIT KEYS switch in SET-UP C.

(102) Enter Duplex Edit Mode.

This function causes all subsequent depressions of the Edit Keys to transmit the appropriate code sequence to the host if the terminal is in ON-LINE or BLOCK Mode.

(103) Enter Local Edit Mode.

This function causes all Edit Keys to perform their function locally, i.e. these keys will affect data in the terminal but no characters associated with the keys will be transmitted to the host.

(104) 925 Enter Protect Mode.

This function places the terminal in Protect Mode and turns on the PROTECTED MODE lamp. When in Protect Mode the cursor may not enter protected (half intensity) fields. Scrolling is disabled while Protect Mode is envoked.

(105) Reserved.

This function is reserved for future assignment.

(106) Erase Cursor To End Of Line with Nulls.

All characters from the cursor position to the end of the current line are erased to Nulls (displayed as blank) with the current attributes. The cursor position is not affected.

When in Protect Mode, only the current unprotected field in the current line from the cursor position to the end of the field is cleared. If the field goes beyond the right margin, the function is limited to the end of the line. If the cursor is in a protected field, the function is ignored.

(107) Erase Cursor To End Of Line Spaces.

All characters from the cursor position to the end of the current line are erased to clear character with the present attributes. The cursor position is not affected.

When in Protect Mode, only the current unprotected field in the current line from the cursor position to the end of the field is cleared. If the field goes beyond the right margin, the function is limited to the end of the line. If the cursor is in a protected field, the function is ignored.

(108) Erase Cursor To End Of Page with Nulls.

All characters from the cursor position to the end of the screen are erased to Nulls (displayed as blank) with the current video attributes. The cursor position is not affected.

When in Protect Mode, only the unprotected fields from the cursor position to the end of the screen are cleared.

(109) **Erase Cursor To End Of Page Spaces.**

All characters from the cursor position to the end of the screen are erased to clear character with the present video attributes. The cursor position is not affected.

When in Protect Mode, only the unprotected fields from the cursor position to the end of the screen are cleared.

(110) **925 Exit Protect Mode.**

Exiting the Protect Mode allows unrestricted movement of the cursor. The current protect attributes have no special meaning when not in Protect Mode. The PROTECTED MODE lamp is turned off. Scrolling is re-enabled.

(111) **Reserved.**

This function is reserved for future assignment.

(112) **925 Field Tab.**

When not in Protect Mode, this function has no effect.

When in Protect Mode, this function is the same as the 925 Tab function. See function # 137.

(113) **925 Home.**

This function moves the cursor to the HOME position on the screen. This will be the left margin position of the top row.

When in Protect Mode, if the HOME position is protected, the cursor will move to the first unprotected position. If none found, and Auto Page Mode is enabled, the other page is searched for an unprotected position. If none found, the cursor pegs at the HOME position of that page.

Note the Auto Page Mode is discarded if a scrolling window other than the default value is defined.

(114) **Home & Clear All Nulls (Clear All Data to Nulls).**

This function exits Protect Mode, Half Intensity Mode, turns off the PROTECT MODE lamp, re-enables scrolling, selects Full Intensity, no Reverse Video, no Blink, no Underline, and no Blank video attributes, and clears the entire screen to nulls with the current attributes. The cursor moves to the HOME position.

(115) **Home & Clear Unprotected Nulls (Clear Unprotected to Nulls).**

When not in Protect Mode, this function causes all characters on the screen to be cleared to Null character with the current video attributes. The cursor moves to the HOME position.

When in Protect Mode, only the unprotected characters on the screen are cleared. In ACT-5A, VT52, or ADM 3A style emulations, the cursor is moved to the first unprotected position on the screen.

(116) **925 Insert Character.**

A clear character with the current attributes is displayed at the cursor position, all characters from the cursor to the right margin are shifted to the right by one character, and the rightmost character is lost. The cursor position is not affected.

When in Protect Mode, the effects of the sequence are field limited if the field ends before right margin, and line limited otherwise. If the cursor is in a protected field, the function has no effect.

(117) **925 Insert Line.**

This function is the same as the Insert Line function of the ACT-5A emulation described above, with one exception viz., when in Protect Mode, the function is ignored. See function # 47.

(118) **Load/Report Time**

This function is used to set the time of day clock which may be displayed on the 25th line, and to report the time to the host.

To set (load) the time enter the following sequence after the Command Sequence Introducer:

        1 N HH MM

        N = A (AM) or P (PM)
        HH= 2 digit number for the hour
        MM= 2 digit number for the minutes

For example, to set the time equal to 9:15 AM using the default 925 lead-in sequence enter the following codes:

ESC (SPACE) 1 A 0915

To report the time to the host the parameter after the lead-in sequence should be a "2".

The ERGO 201 will respond with a 5 character code: A or P, hour and minutes.

(119) **Load User Line.**

This function will load the user line. Up to 80 characters may be entered on the user line. If less than 80 characters are to be displayed on the user line, terminate the user message with a carriage return. Control codes and/or Escape Sequences are not processed when entered as part of the user line. If the 25th line display is enabled while loading the user line, the characters will be seen as entered. The 25th LINE: user/status switch in SET-UP B is selected to user.

(120) **925 New Line.**

This function is the same as receiving a Line feed code followed by a 925 Carriage Return code.

(121) **Normal Screen.**

This function unblanks the screen, if the screen was blanked by the BLANK SCREEN function. This function has no effect on the video attributes.

(122) **925 Report Cursor Position: Page Row Column.**

In response to this function, the active (cursor) position is reported to the host, followed by the Carriage Return (0D Hex) code. The report is not echoed on the screen. If the terminal is in local mode, the function is ignored.

The active position includes the current page number which is 0 (30 Hex) for Page 1 and 1 (31 Hex) for page 2; the line and column numbers are sent in accordance with appendix 6.2.

(123) **925 Report Cursor Position: Row, Column.**

In response to this function, the active (cursor) position is reported to the host, followed by the Carriage Return (0D Hex) code. The report is not echoed on the screen. If the terminal is in local mode, the function is ignored.

The active position includes the line and column numbers which are sent in accordance with appendix 6.2.

(124) **Select Send End Of Transmission (EOT) Character.**
Select Send End Of Line (EOL) Character.

This function is used to define the two character code sequence transmitted at the end of each line during a SEND operation and to define the two character code sequence transmitted at the completion of SEND operation.

The first code after the lead-in code or Command Sequence Introducer is a parameter which determines whether the SEND EOL (End of Line) or SEND EOT (End of Transmission) code sequence is being defined. The parameter is an ASCII "4" (Hex 34) to define the SEND EOT sequence or an ASCII "1" (Hex 31) to define the SEND EOL code sequence. The next two characters define the termination characters. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex).

For example, the default 925 lead-in sequence is Esc x, so define the SEND EOL termination sequence to be carriage return (Hex 0D), line feed (Hex (0A) the complete code sequence is:

```
ASCII:   ESC   x    1    ^M   ^J
HEX:     1B    78   31   0D   0A
```

Similarly, to define only the carriage return (0D Hex) for a Send End OF Transmission, the complete code sequence would be:

```
ASCII:   ESC   x    4    ^@   ^M
HEX:     1B    78   34   00   0D
```

(125) **Send Block All.**

The operation of this function is emulation dependent.

In ACT-5A, VT52, or ADM 3A style emulations, an end of block marker is stored at the current cursor position. All characters between this marker and the nearest previous start of block marker are transmitted to the host. If no previous marker is found, the send operation commences at HOME position. At the end of send operation, the cursor is updated by one position. The start and end of block markers are the same character and are represented by "lower right corner" symbols (refer to the second entry of table 3.8.1).

In 925 style emulation, the screen is searched backwards to find the start of block marker. Then the screen is searched forwards to find the end of block marker. Note that to be compatible with the standard 925 terminal, any start/end of block marker with Half Intensity attribute (protected attribute) will be ignored. This is true even when the terminal is not in Protect Mode. All characters between the two markers are transmitted to the host. If no start of block marker is found, the send operation commences at HOME position. If no end of block marker is found, the send operation terminates at the bottom of the screen. At the end of send operation, the cursor

is updated to the end of block marker location, or to HOME position if no end of block marker was found. The start and end of block markers are represented by the "lower right corner" and "upper right corner" symbols respectively (refer to the second and third entries of table 3.8.2).

For details of send operation please refer to section 4.8.

(126) Send Block Unprotected.

This function works very similar to the Send Block All function described above, except that only unprotected data are transmitted to the host.

For details of send operation please refer to section 4.8.

(127) Send Line All.

The send operation starts at the beginning of the cursor line. The extent of the send operation depends on the SEND range switch in CUSTOM MODE SET-UP 4 which determines whether the operation terminates at the cursor position, or the end of the line. All characters on the line are transmitted to the host. The cursor position is not affected.

For details of send operation please refer to section 4.8.

(128) Send Line Unprotected.

This function works very similar to the Send Line All function described above. Only the unprotected characters on the line are transmitted to the host.

For details of send operation please refer to section 4.8.

(129) Send Page All.

The send Page operation commences at HOME position. The extent of send operation depends on the SEND range switch in CUSTOM MODE SET-UP 4 which determines whether the operation terminates at the cursor position, or at the end of the screen. All characters are transmitted to the host. The cursor position is not affected.

For details of send operation, please refer to section 4.8.

(130) Send Page Unprotected.

This function works very similar to the Send Page All function described above. Only the unprotected characters on the page are transmitted to the host.

For details of send operation please refer to section 4.8.

(131) **Set Column Tab.**

This function sets a tab stop at the current cursor column.

When in Protect Mode, a vertical column of clear characters with the current protected attributes is displayed, from the current cursor position down to the first protected character in the same column of some row down, or to the end of the screen, whichever is first.

(132) **Set Cursor Attribute.**

This function configures the manner in which the cursor is displayed. The parameter after the lead-in sequence specifies the cursor configuration as follows:

Attribute	Parameter	Hex
Cursor Off	0	30
Blinking Block	1	31
Steady Block	2	32
Blinking Underline	3	33
Steady Underline	4	34

TABLE 4.5.1 CURSOR ATTRIBUTES

(133) **Set Print EOT Character to Host.**

This function defines the single character which is automatically reported by the 201 upon completion of a print sequence (see section 4.7.1). The Print EOT character is defined to be the next character received by the 201 after this function is envoked.

NOTE: For effective detection of the Print End Of Transmisson character by the host, the character definition must be carefully selected so that the host will be able to differentiate and extract this report from any keyboard data which may be sent by the operator. Alternatively, the keyboard may be locked while a print operation is in effect.

(134) **Set Screen Background: Dark.**

This function produces a dark screen background with light characters.

(135) **Set Screen Background: Light.**

This function produces a light screen background with dark characters.

(136) **Set 925 Video Attribute.**

This function defines the video attributes in 925 mode. The attribute definition character is displayed as a half intensity blank on the screen. The parameter after the lead-in sequence sets the attribute combination as follows:

TABLE 4.5.2   925 VIDEO ATTRIBUTES

Attributes	Parameter	Hex
Normal	0	30
Blank	1	31
Blink	2	32
Blank Blink	3	33
Reverse	4	34
Blank Reverse	5	35
Reverse Blink	6	36
Blank Reverse Blink	7	37
Underline	8	38
Blank Underline	9	39
Underline Blink	:	3A
Blank Underline Blink	;	3B
Underline Reverse	<	3C
Blank Underline Reverse	=	3D
Underline Reverse Blink	>	3E
Blank Underline Reverse Blink	?	3F

Half Intensity can be added/removed to any of these attributes by enabling/disabling the Half Intensity Mode.

(137) **925 Tab.**

This function causes the cursor to be moved to the next tab stop. If on the last tab stop, the cursor does not move. If the cursor is positioned to the right of the last programmed tab stop, the cursor will not move.

When in Protect Mode, moves the cursor to the beginning of the next unprotected field. If no protected field is found until the bottom of the scrolling window or the bottom of the screen, whichever comes first, then the cursor does not move.

If no unprotected field is found until the end of the screen, then the search starts at the HOME position of the current page if Auto Page Mode is disabled, and of the other page, otherwise.

If a scrolling window is defined to be other than the default,
the Auto Page Mode has no effect.

4.6 CUSTOM FUNCTIONS.

The functions described below are general functions provided to increase the versatility of the ERGO 201. These can be used with any of the existing emulations with the restrictions mentioned therein, or used to create new emulations.

(138) Erase Cursor To End Of Field.

When not in Protect Mode, this function is same as the Erase Cursor to End Of Line with Unprotected Attributes.

When in Protect Mode, only the current unprotected field is cleared. If the cursor is in a protected field, the first unprotected field following the cursor position is cleared. The cursor moves forward to the first unprotected position, if in ACT-5A, VT52, or ADM 3A style emulations.

(139) Report Printer Status.

This function reports the printer status to the host. Verification of the printer status minimizes the risk that an inoperable printer will cause the ERGO 201 to send XOFF to the host and suspend processing of new data until the printer becomes operable.

The terminal sends a five character sequence to host as shown in the table below.

Response	Meaning
EscC?10n	Printer Ready
EscC?11n	Printer temporarily not ready but was ready on power-up.
EscC?13n	No printer. Printer is not ready now and was not ready at power-up

(140) Select Alternate Character Set.

This function selects the alternate character set. If no alternate character set is installed, then blanks will be displayed.

(141) Select Normal Character Set.

This function selects the normal character set.

(142) Set End Protected Field Delimiter.

This function selects the programmable End Protected Field delimiter characters to be the two ASCII characters following the lead in sequence. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex), which will be used as a filler code.

For additional information on the use of the End Protected Field Delimiter please refer to section 4.8.

(143) Set Field Delimiter.

This function selects the programmable Field delimiter characters to be the two ASCII characters following the lead in sequence. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex), which will be used as a filler code.

For additional information on the use of the Field Delimiter please refer to section 4.8.

(144) Set Print Line End Of Transmission (EOT) Character.

This function selects the programmable print end of line delimiter characters to be the two ASCII characters following the lead in sequence. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex), which will be used as a filler code. The defined 2 character sequence will terminate each line of data which is sent from the 201 to the printer.

For additional information on the use of Print Line EOT character please refer to section 4.7.

(145) Set Print End Of Transmission (EOT) Character.

This function selects the programmable print end of operation delimiter characters to be the two ASCII characters following the lead in sequence. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex), which will be used as a filler code. The defined 2 character sequence will be sent by the 201 to the printer to conclude a print operation.

For additional information on the use of Print EOT character please refer to section 4.7.

(146) Set Start Protected Field Delimiter.

This function selects the programmable Start Protected Field delimiter characters to be the two ASCII characters following the lead in sequence. Two characters must be entered for a definition. If a one character sequence is desired, the first of the two characters should be an ASCII NUL (00 Hex), which will be used as a filler code.

For additional information on the use of the Start Protected Field Delimiter please refer to section 4.8.

(147) Set Window.

This function defines the scrolling window. The first parameter after the lead in code specifies the top of the window, and the second parameter specifies the bottom of the window. The parameters specify the line numbers and are in the range of 20 Hex (ASCII SPACE) to 37 Hex (ASCII 7). Top of the screen is 20 Hex and bottom of the screen is 37 Hex.

Default is the entire screen, i.e., no margins-- the entire screen will scroll. The minimum size of the scrolling region allowed is two lines, i.e., the top margin (line number) must be less than the bottom margin (line number). Defining a window does not affect the cursor position. Any error in the parameters will cause the function to be ignored. In that case, the previously defined window will still be in effect.

(148) Reserved.

This function is reserved for future assignment.

(149) Set Clear Character.

This function defines the character used to clear the screen during erase, clear, insert, delete and scrolling operations.

(150) ADDS Cursor Addressing.

This function causes the cursor to be moved to the specified line and column. The general format is:

Lead in Code, Line Number, Column Number.

Section 6.2 of the appendix lists the valid ASCII codes for the line and column numbers. In ACT-5A, VT52, and ADM 3A style emulations, while in Protect Mode, any attempt to position the cursor into a protected field will move it forward to the first unprotected position.

(151) Horizontal Cursor Addressing.

This function causes the cursor to be moved to the specified column in the current line. The general format is:

Lead in Code, Column Number.

Section 6.2 of the appendix lists the valid ASCII codes for the column numbers. In ACT-5A, VT52, and ADM 3A style emulations, while in Protect Mode, any attempt to position the cursor into a protected field will move it forward to the first unprotected position.

(152) **Vertical Cursor Addressing.**

This function causes the cursor to be moved to the specified line. The column position is not affected. The general format is:

Lead in Code, Line Number.

Section 6.2 of the appendix lists the valid ASCII codes for the line numbers. In ACT-5A, VT52, and ADM 3A style emulations, while in Protect Mode, any attempt to position the cursor into a protected field will move it forward to the first unprotected position.

(153) **H1500 Cursor Addressing.**

This function causes the cursor to be moved to the specified line and column. The general format is:

Lead in Code, Column Number, Line Number.

Section 6.2 of the appendix lists the valid ASCII codes for the line and column numbers. In ACT-5A, VT52, and ADM 3A style emulations, while in Protect Mode, any attempt to position the cursor into a protected field will move it forward to the first unprotected position.

If an illegal line number is received, the cursor will move to the bottom row of the screen. If an illegal column code is received, the cursor will move to the right margin.

4.7 Print Modes.

The ERGO 201 supports print operations of several kind as listed below.

Function	Function #
Print Line	48
Print Page	49
Print Block	None
Auto Print Mode	68, 71
Monitored Pass Through Mode	28
Non-Monitored Pass Through Mode	29

Sections 2.16.1, 2.16.2 and 3.5.2 describe switch settings which further define some print operations, particularly user-generated printing (by depression of the SHIFT ENTER/PRINT keys).

The Print Line/Page/Block commands, and the Auto Print Mode, mark the data on the screen, delimited by the command, to be printed later on. The actual print operation then takes place asynchro-nously, in the background, while the terminal can proceed to pro-cess more data from the host. Any attempt to move the cursor to a line marked for printing, or to remove a line marked for printing from the display (e.g., scrolling), will cause the terminal to wait until the printing of that line is complete, or the print operation is aborted. Displayable characters up to the end of the cursor line will be accepted and displayed, before the terminal stops processing data. The Print operation is explained in detail below.

4.7.1 Print Operation.

All the characters determined by the appropriate print operation are passed to the printer. If the data spans more than one line of characters, at the end of printing each line of data, the programmable Print End Of Line Characters (Function # 144) are passed. When the base emulation is 925, an ASCII NUL (00 Hex) is also passed after these characters. At the end of printing the last line of data, (or in case of print line operation, the only line), the programmable Print End Of Transmission Charac-ters (Function # 145) are passed to the printer. At the end of the print operation the programmable print EOT character to Host (Function # 133) is transmitted to the host.

In 925 emulation, trailing ASCII NUL codes (00 Hex) on the screen are suppressed. Otherwise, every character is passed. The control characters on the screen are passed as they are.

In case of Auto Print Mode, only the programmable Print End Of Line characters are sent at the end of each line. The Print End Of Transmission Characters, and the Print EOT character to Host are never used.

When in 925 emulation, the video attribute characters (displayed as Half Intensity Blanks) will cause a special control code to be passed to the printer. These control codes are defined in Table 4.8.1.

However, when in Protect Mode, in the 925 emulation, these video attribute characters, and the protected fields will be passed to the printer as ASCII SPACEs (20 Hex).

NOTE:

When the 925 base emulation is selected, the ASCII NUL (00 Hex) passed to the printer at the end of printing each line of data cannot be suppressed.

4.7.2 Block Print.

This feature is available to the user only through the keyboard; i.e., the host cannot initiate this function. Sections 2.4.7, 2.16.1, 2.16.2, and 3.5.2 describe how to set up and initiate the proper block print operation from the keyboard.

Once selected, the operation of this function is emulation dependent.

In ACT-5A, VT52, or ADM 3A style emulations, an end of block marker is stored at the current cursor position. All characters between this marker and the nearest previous start of block marker are passed to the printer. If no previous marker is found, the print operation commences at HOME position. At the end of print operation, the cursor is updated by one position. The start and end of block markers are the same character and are the "lower right corner" symbol (see the second entry of table 3.8.1).

In 925 style emulations, the screen is searched backwards to find the start of block marker. Then the screen is searched forwards to find the end of block marker. All characters between the two markers are passed to the printer. If no start of block marker is found, the print operation commences at HOME position. If no end of block marker is found, the print operation terminates at the bottom of the screen. At the end of print operation, the cursor is updated to the end of block marker location, or to HOME position if no end of block marker was found. The start and end of block markers are represented by the the "lower right corner" and "upper right corner" symbols respectively (see the second and third entries of table 3.8.1).

4.7.3 Printer Handshaking

The printer can suspend transmission from the ERGO 201 to the printer by either lowering DTR (See section 5.0.4) or sending XOFF to the ERGO 201. Transmission to the printer resumes when an XON is received from the printer (if XOFF had previously been

sent) and DTR is high. The processes of printing and communicat-
ing with the host are managed independently by the ERGO 201,
allowing different data rates to be used on the two channels
without interference. If the printer is used at a slower speed
than the I/O channel, auto XON - XOFF must be used and supported
by the host.

4.8 Send Modes.

The ERGO 201 supports several types of "SEND" operations as listed
below.

Function	Function #
Send Block All	125
Send Block Unprotected	126
Send Line All	127
Send Line Unprotected	128
Send Page All	129
Send Page Unprotected	130

The operation of these SEND functions is emulation dependent.

4.8.1 ACT-5A, VT52, and ADM 3A Style Send.

All emulations except the 925 fall into this category. All
the characters determined by the appropriate send operation
are transmitted to the host.

At the end of transmitting the line of data for a Send Line
function, or each line, including the last line, for Send
Page/Block functions, to the host, the programmable Send End
Of Line Characters (Function # 124) are sent to the host. On
completion of a Send Block operation, the programmable Send
End Of Transmission Characters (Function # 124) are sent to
the host. Note that this is the same as the ACT-5A Send End
Of Block Character (Function # 59).

When not in Protect Mode, the Send all and Send Unprotected
Only functions are equivalent.

When in Protect Mode, the Send Line/Page/Block Unprotected
only functions will transmit only the unprotected characters.
Whenever a Protected field is encountered, the entire pro-
tected field is skipped, and the programmable Field Delimiter
Characters (Function # 143) are sent to the host.

The Send Line/Page/Block All functions will transmit both
unprotected and protected characters. Whenever the start of
a protected field is encountered, the programmable Start Pro-
tect Field Delimiter Characters (Function # 146) are sent to
the host and then the protected field is transmitted to the
host. At the end of transmitting a protected field, the

programmable End Protect Field Delimiter Characters (Function # 142) are sent to the host.

If the last character to be transmitted is protected, the programmable End Protected Field Delimiter Characters are sent to the host before sending the programmable End Of Line Characters for the last line.

4.8.2 925 Style Send.

Any emulation based on the 925 falls into this category. All the characters determined by the appropriate send operation are transmitted to the host.

At the end of transmitting each line of data for Send Page/ Block functions, the programmable Send End Of Line Characters (Function # 124) are sent to the host. At the end of transmitting the last line of data for Send Page/Block functions, or the only line for a Send Line function, the programmable Send End Of Transmission Characters (Function # 124) are sent to the host.

When not in Protect Mode, the Send all, and Send Unprotected Only functions behave the same.

When in Protect Mode, the Send Line/Page/Block Unprotected Only functions will transmit only the unprotected characters. Note that only Half Intensity is the protected attribute in Televideo 925 style Emulations. Whenever a protected field is encountered, the entire protected field is skipped, and the programmable Field Delimiter Characters (Function # 143) are sent to the host.

The Send Line/Page/Block All functions will transmit both protected and unprotected characters. Whenever the start of a protected field is encountered, the programmable Start Protect Field Delimiter Characters (Function # 146) are sent to the host and then the protected field is transmitted to the host. At the end of transmitting a protected field, the programmable End Protect Field Delimiter Characters (Function # 142) are sent to the host.

If the last character to be sent is protected, the programmable End Protected Field Delimiter Characters are sent to the host before sending the programmable Send End Of Transmission Characters.

In the 925 style emulations, any change in the video attributes takes up a character position on the screen. When these characters are encountered during a Send operation special information is transmitted to the host.

When not in Protect Mode, a special control code is transmitted to the host to indicate which attribute it is. Table 4.8.1 indicates the different control codes transmitted.

TABLE 4.8.1   ATTRIBUTE CONTROL CODES

Video Attributes	ASCII Character	Hexadecimal Value
Normal(No attributes)	CTRL P	10
Blank	CTRL Q	11
Blink	CTRL R	12
Blank Blink	CTRL S	13
Reverse	CTRL T	14
Blank Reverse	CTRL U	15
Reverse Blink	CTRL V	16
Blank Reverse Blink	CTRL W	17
Underline	CTRL X	18
Blank Underline	CTRL Y	19
Underline Blink	CTRL Z	1A
Blank Underline Blink	CTRL [	1B
Underline Reverse	CTRL \	1C
Blank Underline Reverse	CTRL]	1D
Underline Reverse Blink	CTRL ^	1E
Blank Underline Reverse Blink	CTRL _	1F

When in Protect Mode, the video attribute characters are treated as protected fields. Any attribute character encountered during a Send Unprotected Only is treated as a protected field or part of a protected field if contiguous protected characters (Half Intensity) are present, and so the field is skipped, and the programmable Field Delimiter Characters are sent to the host.

Any attribute character encountered during a Send All function is treated in a special manner. The actual command required to form that attribute on the screen is configured and sent to the host. This will allow recreating the screen exactly as it was formated. The command sent back has the following format.

Lead in Code, Parameter.

The Parameters are defined in Table 4.5.2 and used analo-
gously to the Set 925 Video Attribute (function # 136). The
lead in code is the currently assigned code for the Set 925
Video Attributes command. The default is:

ESC G   (1B, 47 Hex).

NOTE:

Several custom codes can be assigned to this function (for
that matter to any function) in the ERGO 201. The codes
could be control codes and/or Escape sequences. When custom
codes are defined, the terminal overrides the standard lead
in code, and chooses the very first custom code it comes
across that defines this function, for transmitting to the
host. The custom codes are searched for, Control codes first
and then the Escape Sequences.

Note also that in the 925 emulation, the codes sent when a
protected field is encountered (Half Intensity fields, but
not the attribute characters), are the actual code sequence
to define the start and end of Write Protect Mode (functions
104 and 110). The ERGO 201 however, is more versatile.   The
ERGO 201 has programmable characters for the start and end
protected fields (functions # 142, 146).   So the user can
customize these characters to his choice of codes, which will
be sent to the host. The default for the emulation will be
the same codes as the 925 codes.

5. External Interfaces

5.0.1 Power/Environment

The ERGO 201 was factory set to operate at 115v. +- 10% 60 Hz. The ambient temperature must be within the range of 5 - 40 degrees C.

5.0.2 25 Pin EIA Connector to Host

If XON/XOFF Protocol is selected the Data Terminal Ready line (I/O connector) is normally asserted whenever the ERGO 201 is powered up. However, DTR may be forced low for the duration of the long break (modem disconnect) signal by typing SHIFT BREAK.

If DTR Protocol is selected and the Auto Protocol Feature is enabled the DTR line will go low to indicate when the terminal is not ready to receive data from the host.

If your installation supports neither XON/XOFF or DTR protocol then set the ERGO 201 for DTR protocol and disable the Auto Protocol feature.

PIN

1	Protective Ground	Common
2	Serial Out (Data)	From ERGO 201
3	Serial In (Data)	To ERGO 201
4	Request to Send (Out)	Asserted whenever the ERGO 201 is on
5	Clear to Send (In)	Unused in Full Duplex
6	Data Set Ready (In)	Unused in Full Duplex
7	Signal Ground	Common
18	+5v @ 50 ma	use only
19,20	Data Terminal Ready (Out)	(State depends on Protocol Selection)

All signal levels at the 25 pin I/O connector must conform to
EIA STD RS-232-C. Signals originating from the ERGO 201 con-
form to this standard when properly loaded. In   particular,
the   "mark",   "low",   "off",   or "unasserted" state exists
when the level at the appropriate pin is in the range -3 to
-25v.   The   "space",   "high", "on", or "asserted" state
exists when the voltage is +3 to +25v. referenced to pin 7.

The minimum interface for bidirectional data transfer con-
sists   of   the   interconnecting pins 2,3 and 7 between the
ERGO 201 and the host. All unconnected input control lines
on the I/O connector assume the unasserted state.

5.0.3 Current Loop

The ERGO 201 may be adapted to Current Loop applications by
purchase of a current loop adapter from Micro-Term or
your local Micro-Term distributor.   This connector plugs
into the RS232 (I/O) port and is housed in a plastic case
approximately 4.2"x1"x0.5" . Instructions for installation
are provided with the device.

5.0.4 Connector to Printer

1	Protective Ground	Common
2	Serial In (XON/XOFF)	To ERGO 201
3	Serial Out (Data)	From ERGO 201
7	Signal Ground	Common
20	Data Terminal Ready (In)	Disables Transmission
		from ERGO 201 when not Asserted.

Pin 20 assumes the unasserted state at the ERGO 201 if not
connected. XON/XOFF transmission can be verified by program-
ming the 25th status line to include printer diagnostics
(2.18.1).

5.1 In Case of Difficulty

5.1.1 Self-Test Error Codes

After power up, or whenever the self tests are performed, a single digit error code will be displayed in the upper left hand corner of the display if any of the tests are not successfully passed. The significance of the error digit appearing on the screen are summarized below.

Error Message	Significance
1	At least one bit of display memory is not properly accessible. Depending upon the degree of disfunction, the effect of the memory failure may not otherwise be immediately apparent to the user.
2	The integrity of the data retrieved from the EAROM can not be verified. A set of default values are used in place of the EAROM data to "SET-UP" the ERGO 201. The SET-UP features must be verified and corrected for the user's application.
3	Display Memory and EAROM Failure
4	ROM Checksum Failure: The internal program memory cannot be verified.
5	ROM and Display Failure
6	ROM and EAROM Failure
7	ROM, EAROM and Display Failure

If, after power up, there is no display but the some keyboard lamps are illuminated then there may have been a detected failure of the internal processor RAM and the terminal must be repaired. All other detected errors are non-fatal in that the user may proceed at risk to use the terminal, but a processor RAM error will immediately cause the terminal to suspend operation.

Other, non self-diagnosable, hardware failures will generally
render the terminal inoperable or have very specific display
symptoms.

5.1.2 Troubleshooting Suggestions

1 Keyboard Locked: Verify that the host sends XON after XOFF to re-enable transmission from the ERGO 201.

2 Checkerboard Character on Screen: Verify the I/O interface including signal levels, speeds, number of data bits, and parity at both the ERGO 201 and the host.

3 5 Bells Upon Power-Up: Hardware failure. Refer to Section 5.1.

4 No Communication To/From Host: Verify the I/O connections in 5.0.2. Verify data rates and word format. Be sure that transmission from either the host or the ERGO 201 has not been suspended due to receipt of "XOFF"; check using programmable diagnostic status line with the "INTERFACE" option selected (2.13.3). Verify keyboard operation in LOCAL mode Verify that a print operation has not been suspended indefinitely.

5 Blank Display: Be sure that the ERGO 201 is turned on and connected to the proper source. Depress any key to reset the "screen saver" feature which will blank the display after 8 minutes of inactivity when enabled.

6 No Cursor: Be sure that the cursor has not been disabled by the host or the user (2.8.1).

6. APPENDICES

6.1 Table of ASCII Codes

TABLE OF ASCII CODES

CTRL	Character	Binary Bit 7 to Bit 0	Octal	Decimal	Hexadecimal
@	NUL	00000000	000	000	00
A	SOH	00000001	001	001	01
B	STX	00000010	002	002	02
C	ETX	00000011	003	003	03
D	EOT	00000100	004	004	04
E	ENQ	00000101	005	005	05
F	ACK	00000110	006	006	06
G	BEL	00000111	007	007	07
H	BS	00001000	010	008	08
I	HT	00001001	011	009	09
J	LF	00001010	012	010	0A
K	VT	00001011	013	011	0B
L	FF	00001100	014	012	0C
M	CR	00001101	015	013	0D
N	SO	00001110	016	014	0E
O	SI	00001111	017	015	0F
P	DLE	00010000	020	016	10
Q	DC1	00010001	021	017	11
R	DC2	00010010	022	018	12
S	DC3	00010011	023	019	13
T	DC4	00010100	024	020	14
U	NAK	00010101	025	021	15
V	SYN	00010110	026	022	16
W	ETB	00010111	027	023	17
X	CAN	00011000	030	024	18
Y	EM	00011001	031	025	19
Z	SUB	00011010	032	026	1A
[	ESC	00011011	033	027	1B
\	FS	00011100	034	028	1C
]	GS	00011101	035	029	1D
∧	RS	00011110	036	030	1E
—	US	00011111	037	031	1F
	SP	00100000	040	032	20
	!	00100001	041	033	21
	"	00100010	042	034	22
	#	00100011	043	035	23
	$	00100100	044	036	24
	%	00100101	045	037	25
	&	00100110	046	038	26
	'	00100111	047	039	27
	(	00101000	050	040	28
	)	00101001	051	041	29
	*	00101010	052	042	2A

Character	Binary Bit 7 to Bit 0	Octal	Decimal	Hexadecimal
+	00101011	053	043	2B
,	00101100	054	044	2C
—	00101101	055	045	2D
.	00101110	056	046	2E
/	00101111	057	047	2F
0	00110000	060	048	30
1	00110001	061	049	31
2	00110010	062	050	32
3	00110011	063	051	33
4	00110100	064	052	34
5	00110101	065	053	35
6	00110110	066	054	36
7	00110111	067	055	37
8	00111000	070	056	38
9	00111001	071	057	39
:	00111010	072	058	3A
;	00111011	073	059	3B
<	00111100	074	060	3C
=	00111101	075	061	3D
>	00111110	076	062	3E
?	00111111	077	063	3F
@	01000000	100	064	40
A	01000001	101	065	41
B	01000010	102	066	42
C	01000011	103	067	43
D	01000100	104	068	44
E	01000101	105	069	45
F	01000110	106	070	46
G	01000111	107	071	47
H	01001000	110	072	48
I	01001001	111	073	49
J	01001010	112	074	4A
K	01001011	113	075	4B
L	01001100	114	076	4C
M	01001101	115	077	4D
N	01001110	116	078	4E
O	01001111	117	079	4F
P	01010000	120	080	50
Q	01010001	121	081	51
R	01010010	122	082	52
S	01010011	123	083	53
T	01010100	124	084	54
U	01010101	125	085	55

Character	Binary Bit 7 to Bit 0	Octal	Decimal	Hexadecimal
V	01010110	126	086	56
W	01010111	127	087	57
X	01011000	130	088	58
Y	01011001	131	089	59
Z	01011010	132	090	5A
[	01011011	133	091	5B
\	01011100	134	092	5C
]	01011101	135	093	5D
∧	01011110	136	094	5E
—	01011111	137	095	5F
'	01100000	140	096	60
a	01100001	141	097	61
b	01100010	142	098	62
c	01100011	143	099	63
d	01100100	144	100	64
e	01100101	145	101	65
f	01100110	146	102	66
g	01100111	147	103	67
h	01101000	150	104	68
i	01101001	151	105	69
j	01101010	152	106	6A
k	01101011	153	107	6B
l	01101100	154	108	6C
m	01101101	155	109	6D
n	01101110	156	110	6E
o	01101111	157	111	6F
p	01110000	160	112	70
q	01110001	161	113	71
r	01110010	162	114	72
s	01110011	163	115	73
t	01110100	164	116	74
u	01110101	165	117	75
v	01110110	166	118	76
w	01110111	167	119	77
x	01111000	170	120	78
y	01111001	171	121	79
z	01111010	172	122	7A
{	01111011	173	123	7B
¦	01111100	174	124	7C
}	01111101	175	125	7D
~	01111110	176	126	7E
DEL	01111111	177	127	7F

6.2 Cursor addressing tables

CURSOR ADDRESSING TABLES

6.3 Warranty and Service Information

(A) The ERGO 201 requires no maintenance and should perform faithfully for many years. Micro-Term will repair any unit which fails within the original warranty period provided that the terminal has not been abused or modified in any way.

(B) The ERGO 201 is accompanied by a limited one year warranty. For in-warranty service, the user may elect to return either the defective board or the entire unit to the factory, freight prepaid. Micro-Term will return in-warranty repair freight prepaid for the first ninety days of the warranty period, and freight collect thereafter.

(C) Beyond the warranty period, Micro-Term will charge a nominal fee for the repair of any ERGO 201. A complete technical manual, including schematic, theory of operation, and timing diagrams is available for owners of the ERGO 201. Any further information relating to the operation or interfacing of your ERGO 201 can be obtained by contacting our Marketing Department at the address below.

(D) If you would prefer to have your terminal serviced at your location, a convenient plan is available throughout the continental United States For one low monthly fee, your terminal will be repaired at your site within one business day of your call for assistance. To begin your service agreement, or for more information on our maintenance plan, please call our service department at the number listed below.

```
Micro-Term, Inc.
512 Rudder Rd.
St. Louis, Mo. 63026
(314) 343 6515
ATTENTION:  MARKETING
```

MICRO-TERM, INC.
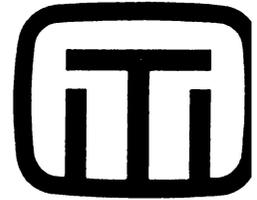
Your new Micro-Term terminal carries a one year warranty on parts and labor. For service under this warranty, it is the customer's responsibility to properly pack the terminal for shipping and return it (freight prepaid) to Micro-Term, Inc., 1314 Hanley Industrial Court, St. Louis, Missouri 63144. The terminal will be repaired within five to ten days and returned freight prepaid. Hence, the customer pays the freight to Micro-Term, and Micro-Term pays the freight back to the customer.

If you would prefer to have your terminal serviced at your location, a convenient plan is available throughout the continental United States. For one low monthly fee, your terminal will be repaired at your site within one business day of your call for assistance. To begin your service agreement, or for more information on our maintenance plan, please call our service department at 1-800-325-9056 (in Missouri, please call 314-968-8151). A sample contract and list of service locations are attached for your convenience.

In order to efficiently handle your call, we will need the serial number from the bottom or rear panel on your terminal. Having this number on hand will prevent unnecessary delay on your call.

MICRO-TERM, INC.
1314 HANLEY INDUSTRIAL CT.
ST. LOUIS, MO. 63144

SERVICE AGREEMENT - FLAT RATE

AGREEMENT, made this _____( ) day of _____ 19___ by and between MICRO-TERM, INC., a corporation having its principal place of business at 1314 Hanley Industrial Court, St. Louis, MO 63144, and

_____

having its principal place of business in

_____

(hereinafter calld "Customer").

Equipment Location   _____

                          _____

Contact Person   _____

Telephone   _____

EQUIPMENT TO BE MAINTAINED

MODEL #	SERIAL #	QUANTITY	MONTHLY CHARGE/UNIT
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Customer Name and Billing Address:

MICRO-TERM, INC.   _____

1314 Hanley Industrial Court   _____

St. Louis, MO 63144   _____

By: _____   By: _____

                           Title_____Date _____

ARTICLE 1 - WORK DESCRIPTION

Micro-Term personnel or the personnel of an independent third party maintenance organization ("Personnel") shall perform the following services on the equipment and at the premises described in PART I.

The Service will consist of Micro-Term's maintaining the terminal equipment listed on the reverse of this contract in properly functioning and good working order. Such Service will be performed at the customer's premises listed on the reverse of this contract.

ARTICLE 2 - INSPECTION CHARGE

Micro-Term or the customer may require an inspection of the equipment prior to acceptance of this agreement in the case of terminals which are not placed under Service Agreement immediately upon purchase. In this event, the Customer agrees to pay an inspection fee of $75.00 per terminal.

ARTICLE 3 - PREMISES

a. If Service is to be performed at Premises other than those of Customer, Customer shall arrange for the access of Personnel thereto.

b. Customer shall provide for use of Personnel a work area which shall provide adequate light, heat, ventilation, and suitable electric current and outlets for testing purposes.

ARTICLE 4 - REPLACEMENT PARTS

Micro-Term will furnish at no cost to customer, all replacement parts and components, for performance of the services specified in Article 1.

ARTICLE 5 - CHARGES

Charges for all Service calls are covered by the flat rate monthly charge as listed on the reverse of this contract. Service will be performed only on business days during normal working hours. No holiday or weekend work will be performed. Charges are subject to change with 30 days written notice from Micro-Term.

ARTICLE 6 - BILLING

A single quarterly bill will be rendered to the billing address as shown in the "CUSTOMER BILLING ADDRESS" on the front side of this Agreement.

Where terminals are activated during the month, billing will be pro-rated according to the number of days the terminals are in service during the initial month.

ARTICLE 7 - LIABILITY

MICRO-TERM SHALL USE ITS BEST EFFORTS TO PERFORM THE SERVICE WITHIN A REASONABLE TIME AFTER REQUEST BY CUSTOMER, BUT SHALL NOT BE LIABLE OR DEEMED TO BE IN DEFAULT HEREUNDER FOR ANY DELAY OR FAILURE IN PERFORMANCE HEREUNDER OR FOR ANY INTERRUPTIONS TO THE OPERATION OF THE EQUIPMENT AND TO ANY RELATED EQUIPMENT RESULTING, DIRECTLY OR INDIRECTLY, FROM UNAVAILABILITY OF TECHNICIANS OR PARTS, ACCIDENTS, FIRES, EXPLOSIONS, STRIKES, LABOR DISPUTES, SHORTAGES OF LABOR AND TRANSPORTATION, AND ANY SIMILAR OR DISSIMILAR CAUSES BEYOND ITS REASONABLE CONTROL. IN NO EVENT SHALL MICRO-TERM BE LIABLE FOR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES, REGARDLESS OF THE NATURE OF THE CLAIM OR THE FORM OF THE ACTION ARISING FROM, GROWING OUT OF, OR INCIDENTAL TO PERFORMANCE OR NONPERFORMANCE OF THE SERVICE. DIRECT DAMAGES, IF ANY, SHALL BE LIMITED TO A PROPORTIONATE SHARE OF THE CHARGES ACTUALLY PAID FOR THE SERVICES INVOLVED.

ARTICLE 8 - TAXES

The charges to be paid by Customer to Micro-Term under this Agreement do not include any Federal, State, or local taxes, however designated, which may be levied upon the Service or upon the spare parts and components to be provided by Micro-Term hereunder. With respect to such taxes, Customer agrees to pay to Micro-Term, upon timely presentation of invoices therefore, such amounts thereof as Micro-Term may by law be required to collect.

ARTICLE 9 - MISCELLANEOUS

a. Neither this Agreement or any rights hereunder may be assigned by Customer without prior written consent of Micro-Term.

b. This Agreement shall be governed by the laws of the State of Missouri.

c. In the event of any conflict between customer's purchase order and this Agreement, this Micro-Term Service Agreement shall govern.

ARTICLE 10 - TERM

This Agreement shall be in full force and effect on the date first herein above mentioned and remain in effect for the initial term of one year and thereafter may be terminated by either party hereto at any time after thirty (30) days prior written notice to the other, provided however, that Micro-Term may change rates at any time upon thirty days' prior written notice to Customer, during which period the Customer may elect to cancel the Agreement. Except for such rate charges the Agreement may not be supplemented or amended except by an instrument in writing signed by a duly authorized representative of each of the parties.

Alabama
Anniston
Birmingham
Decatur
Cothan
Huntsville
Mobile
Montgomery
Tuscaloosa

Arizona
Flagstaff
Phoenix
Tuscon
Yuma

Arkansas
El Dorado
Fort Smith
Jonesboro
Little Rock
Pine Bluff
Springdale

California
Bakersfield
Carson
Colton
El Centro
Fresno
Inglewood
Lancaster
Los Angeles(Cntrl)
Los Angeles(West)
Oakland
Ontario
Oxnard
Palm Springs
Redding
Redwood City
Sacramento
Salinas
San Diego
San Francisco
Santa Ana
Santa Barbara
Santa Clara
Santa Maria
Santa Rosa
So. El Monte
So. San Francisco
Stockton
Thousand Oaks
Van Nuys

Colorado
Colorado Springs
Denver
Grand Junction
Greeley
Pueblo

Connecticut
Bridgeport
Danbury
Hartford
Middletown
New Haven
New London
Norwalk
Stamford
Waterbury

Deleware
Dover
Wilmington

Florida
Clearwater
Cocoa Beach
Daytona Beach
Ft. Lauderdale
Ft. Myers
Ft. Pierce
Ft. Walton Beach
Gainesville
Hollywood
Homestead
Jacksonville
Lakeland
Miami
Orlando
Panama City
Pensacola
Sarasota
St. Petersburg
Tallahassee
Tampa
Valdosta
West Palm Beach

Georgia
Albany
Athens
Atlanta
Chamblee
Columbus
Dalton
East Point
Macon
Rome
Savannah
Vadosta

Idaho
Boise
Pocatello

Illinois
Aurora
Belleville
Bloomington
Burr Ridge
Champaign
Danville
Decatur
Des Plaines
Effingham
Elgin
Elk Grove Village
Harvey
Joliet
LaSale
Marion
Moline
Mt. Vernon
Northern Palatine
Peoria
Quincy
Rockford
Skokie
Springfield
Waukegan

Chicago
Main Service Cntr
North Service Cntr
East Service Cntr
West Service Cntr

Indiana
Anderson
Columbus
Elkhart
Evansville
Ft. Wayne
Gary
Indianapolis
Lafayette
Peru
Richmond
South Bend
Terre Haute
Vincennes

Iowa
Cedar Rapids
Davenport
Des Moines
Ft. Dodge
Ft. Madison
Mason City
Sioux City
Waterloo

Kansas
Dodge City
Hutchinson
Salina
Topeka
Wichita

Kentucky
Ashland
Bowling Green
Lexington
Louisville
Owensboro
Paducah

Louisiana
Alexandria
Baton Rouge
Houma
Larayette
Lake Charles
Monroe
New Orleans
Shreveport

Maine
Bangor
Lewiston
Portland
Presque Isle

Maryland
Baltimore
Cumberland
Hagerstown
Salisbury
Silver Spring

Massachusetts
Boston
Brockton
Cambridge
Fitchburg
Foxboro
Framingham
Greenfield
Hyannis
Lawrence
Lexington
Lowell
Malden
Needham
New Bedford
Newton
North Adams
Norwood
Quincy
Salem
Springfield
Waltham
Woburn
Worchester

Michigan
Battle Creek
Benton Harbor
Detroit Oak Pk
Flint
Grand Rapids
Jackson
Kalamazoo
Lansing
Marquette
Muskegon
Oak Park
Oscoda
Petoskey
Pontiac
Romulus
Saginaw
Sault Ste Marie

Minnesota
Duluth
Mankato
Minneapolis
Rochester
St. Cloud
St. Paul

Mississippi
Columbus
Greenville
Gulfport
Hattiesburg
Jackson
Meridian
Tupelo

Missouri
Cape Girardeau
Jerferson City
Joplin
Kansas City
Lebanon
Moberly
Sedalia
Springfield
St. Joseph
St. Louis

Montana
Billings
Great Falls
Helena

Nebraska
Grand Island
Lincoln
North Platte
Omaha
Scottsbluff

Nevada
Las Vegas
Reno

New Hampshire
Manchester
Portsmouth

New Jersey
Ashbury Park
Atlantic City
Cherry Hill
Hackensack
Hadonfield
Irvington
Trenton
Vineland

New Mexico
Alamogordo
Albuquerque
Boswell
Clovis

New York
Albany
Binghamton
Buffalo (2)
Central Islip
Colonie
Commack
East Syracuse
Elmhurst
Elmia
Framingdale
Glen Falls

Kenmore
Long Island City
Lynnbrook
Mineola
Newburgh
New York City
Niagra Falls
Olean
Patchouge
Peekskills
Plattsburgh
Poughkeepsie
Queens
Rochester
Spring Valley
Syosset
Syracuse
Utica
Watertown
White Plains

New York City
26 Broadway
600 Third Avenue
Syoset, L.I.

North Carolina
Asheville
Charlotte
Durham
Fayetteville
Greensboro
Hickory
New Bern
Raleigh
Rocky Mount
Wilmington
Winston-Salem

North Dakota
Bismarck
Fargo
Grand Forks
Minot

Ohio
Akron
Cincinnati
Cleveland
Columbus
Dayton
Derfiance
Elyria
Lima
Mansfield
Newark
Portsmouth
Tiffin
Toledo
Youngstown
Zanesville

Oklahoma
Enid
Lawton
Muskogee
Oklahoma City (2)
Tulsa

Oregon
Eugene
Medford
Portland
Salem

Pennsylvania
Allentown
Altoona
Dubois
Erie
Greenburgh
Harrisburg
Hazelton
Lancaster
Lemoyne
New Castle
New Kensington
Newtown Square
Norristown
Philadelphia (2)
Pittsburgh
Scranton
Washington
Waynesboro
Wilkes-Barre
Williamsport
Wyomissing
York

Rhode Island
Charleston
Columbia
Florence
Greenville
North Augusta

South Dakota
Huron
Rapid City
Sioux Falls

Tennessee
Chattanooga
Jackson
Kingsport
Knoxville
Memphis
Nashville

Texas
Abilene
Amarillo
Austin
Beaumont
Bellaire
Brownsville
Bryan
Corpus Christi
Dallas
Dennison
El Paso
Ft. Worth
Glaveston
Harlingen
Houston
Laredo
Lubbock
Lufkin
McAllen
Odessa
San Antonia
Tyler
Texarkana
Waco
Wichita Falls

Utah
Ogden
Salt Lake City

Vermont
Burlington
St. Johnsbury
White River Jctn.

Virginia
Abingdon
Arlington
Culpeper
Fredericksburg
Lynchburg
Norfolk
Richmond
Vinton (Roanoke)
Waynesboro
Winchester

Washington
Everett
Pasco
Seattle
Spokane
Tacoma
Yakima

Washington, D.C.

West Virginia
Beckley
Bluefield
Charleston
Fairmont
Huntington
Pakersourg
Wheeling

Wisconsin
Appleton
Eau Claire
Green Bay
Janesville
Kenosha
La Crosse
Madison
Milwaukee
Oshkosh
Sheboygan
Wausau
West Allis

Wyoming
Casper
Cheyenne

Hawaii
Western Union of
   Hawaii, Inc.

CONTENTS

0.1 ADDENDUM TO THE ERGO 201 OPERATING MANUAL

MTI Part Number: 79850013.00

0.1.1 CONTROL CODES & ESCAPE SEQUENCES

ACT-5A Control Codes

Code	Hex	Function
^@	00	
^A	01	
^B	02	
^C	03	
^D	04	
^E	05	Report Cursor Position
^F	06	
^G	07	Bell
^H	08	Backspace(Cursor Left)
^I	09	Tab
^J	0A	LineFeed
^K	0B	Cursor Down
^L	0C	Home & Clear to Cur. Attr.
^M	0D	Carriage Return
^N	0E	Change Intensity
^O	0F	
^P	10	Print Page
^Q	11	
^R	12	Reverse Tab
^S	13	
^T	14	Cursor Addressing
^U	15	
^V	16	
^W	17	
^X	18	Cursor Right
^Y	19	Exit (Non)Monitored Printer Mode
^Z	1A	Cursor Up
^[	1B	Escape Functions Lead in
^	1C	
^]	1D	Home
^^	1E	Erase Cursor To EOL Cur. Attr.
^_	1F	Erase Cursor To EOS Cur. Attr.

ACT-5A Escape Sequences

Code	Hex	Function
ESC (Space)	1B 20	Report Product Code
ESC 4	1B 34	Wrap Enable
ESC 5	1B 35	Wrap Disable
ESC 6	1B 36	Delete Character
ESC 7	1B 37	Insert Line
ESC 8	1B 38	Delete Line
ESC 9	1B 39	Set EOB Character
ESC :	1B 3A	Cursor Off
ESC ;	1B 3B	Cursor On
ESC <	1B 3C	Enable Keyclick
ESC =	1B 3D	Disable Keyclick
ESC >	1B 3E	Select Smooth Scroll
ESC ?	1B 3F	Select Jump Scroll
ESC @	1B 40	EEL to Protected
ESC A	1B 41	Underline current character
ESC B	1B 42	Foreground Follows
ESC C	1B 43	Background Follows
ESC D	1B 44	Enter Protect Mode
ESC E	1B 45	Exit Protect Mode
ESC F	1B 46	Print Line
ESC G	1B 47	Insert Character
ESC H	1B 48	Reverse Line Feed
ESC I	1B 49	EEL to Unprotected
ESC J	1B 4A	EES to Protected
ESC K	1B 4B	EES to Unprotected
ESC L	1B 4C	Clear Unprotected
ESC M	1B 4D	Enter Graphics Mode
ESC N	1B 4E	Exit Graphics Mode
ESC O	1B 4F	Report Character at Cursor
ESC R	1B 52	Report Video Attributes
ESC S	3B 53	Set Video Attributes
ESC T	1B 54	Enable Scroll
ESC U	1B 55	Disable Scroll
ESC V	1B 56	Start Blink Field
ESC W	1B 57	End Blink Field
ESC X	1B 58	Start Reverse Video Field
ESC Y	1B 59	End Reverse Video Field
ESC Z	1B 5A	Start Underline Field
ESC [	1B 5B	End Underline Field
ESC	1B 5C	Enter Monitored Printer Mode
ESC]	1B 5D	Enter Non Monitored Printer Mode
ESC ^	1B 5E	Set Send Data Type - Unprotected
ESC _	1B 5F	Set Send Data Type - All
ESC `	1B 60	Home and Clear to Protected Spaces
ESC a	1B 61	Home and Clear to Unprotected Spaces

ADM-3A Control Codes

Code	Hex	Function
^@	00	
^A	01	
^B	02	
^C	03	
^D	04	
^E	05	
^F	06	
^G	07	Bell
^H	08	Backspace(Cursor Left)
^I	09	
^J	0A	LineFeed (Cursor Down)
^K	0B	Cursor Up
^L	0C	Cursor Right
^M	0D	Carriage Return
^N	0E	Unlock Keyboard
^O	0F	Lock Keyboard
^P	10	
^Q	11	
^R	12	
^S	13	
^T	14	
^U	15	
^V	16	
^W	17	
^X	18	
^Y	19	
^Z	1A	Home & Clear To Cur. Attr.
^[	1B	Escape Functions Lead In
^	1C	
^]	1D	
^^	1E	Home
^_	1F	Erase Cursor TO EOS To Crt. Attr.

ADM-3A Escape Sequences

Code	Hex	Function
ESC =	1B 3D	Cursor Addressing

VT-52 Control Codes

Code	Hex	Function
^@	00	
^A	01	
^B	02	
^C	03	
^D	04	
^E	05	
^F	06	
^G	07	Bell
^H	08	Backspace(Cursor Left)
^I	09	Tab
^J	0A	LineFeed
^K	0B	
^L	0C	
^M	0D	Carriage Return
^N	0E	
^O	0F	
^P	10	
^Q	11	
^R	12	
^S	13	
^T	14	
^U	15	
^V	16	
^W	17	
^X	18	
^Y	19	
^Z	1A	
^[	1B	Escape Functions Lead In
^\	1C	
^]	1D	
^^	1E	
^_	1F	

VT-52 Escape Sequences

Code	Hex	Function
ESC =	1B 3D	Enter Alternate Keypad Mode
ESC >	1B 3E	Exit Alternate Keypad Mode
ESC A	1B 41	Cursor Up
ESC B	1B 42	Cursor Down
ESC C	1B 43	Cursor Right
ESC D	1B 44	Cursor Left
ESC F	1B 46	Enter Graphics Mode
ESC G	1B 47	Exit Graphics Mode
ESC H	1B 48	Home
ESC I	1B 49	Reverse Line Feed
ESC J	1B 4A	EES to Current Attributes
ESC K	1B 4B	EEL to Current Attributes
ESC W	1B 57	Enter Non Monitored Printer Mode
ESC X	1B 58	Exit Non Monitored Printer Mode
ESC Y	1B 59	Cursor Addressing
ESC Z	1B 5A	Identify Terminal
ESC [	1B 5B	Enter Hold Screen Mode
ESC	1B 5C	Exit Hold Screen Mode
ESC ^	1B 5E	Enter Auto-Print Mode
ESC _	1B 5F	Exit Auto-Print Mode

Televideo 925 Control Codes

Code	Hex	Function
^@	00	
^A	01	
^B	02	
^C	03	
^D	04	
^E	05	
^F	06	
^G	07	Bell
^H	08	Backspace (Cursor Left)
^I	09	Tab
^J	0A	LineFeed
^K	0B	Cursor Up
^L	0C	Cursor Right
^M	0D	Carriage Return
^N	0E	Disable XON/XOFF
^O	0F	Enable XON/XOFF
^P	10	
^Q	11	
^R	12	Enable Bidirection Printer
^S	13	
^T	14	Disable Bidirectional Printer
^U	15	
^V	16	Cursor Down
^W	17	
^X	18	
^Y	19	
^Z	1A	Home & Clear Unprotected Spaces
^[	1B	Escape Functions Lead in
^\	1C	
^]	1D	
^^	1E	Home
^_	1F	Newline

Televideo 925 Escape Sequences

Code	Hex	Function
ESC (Space)	1B 20	Load/Read Time
ESC "	1B 22	Unlock Keyboard
ESC #	1B 23	Lock Keyboard
ESC &	1B 26	Enter Protect Mode
ESC '	1B 27	Exit Protect Mode
ESC (	1B 28	Disable Write Protect
ESC)	1B 29	Enable Write Protect
ESC *	1B 2A	Clear All Nulls
ESC +	1B 2B	Clear Unprotected Spaces
ESC ,	1B 2C	Clear All to Half Intensity
ESC -	1B 2D	Cursor Addressing PRC
ESC .	1B 2E	Set Cursor Attributes
ESC /	1B 2F	Report Cursor Position PRC
ESC 1	1B 31	Set Column Tab
ESC 2	1B 32	Clear Column Tab
ESC 3	1B 33	Clear All Tabs
ESC 4	1B 34	Send Line Unprotected
ESC 5	1B 35	Send Page Unprotected
ESC 6	1B 36	Send Line All
ESC 7	1B 37	Send Page All
ESC :	1B 3A	Clear Unprotected to nulls
ESC ;	1B 3B	Clear Unprotected to spaces
ESC <	1B 3C	Keyclick Off
ESC =	1B 3D	Cursor Addressing RC
ESC >	1B 3E	Keyclick On
ESC ?	1B 3F	Report Cursor Position RC
ESC @	1B 40	Enter MPTP Mode
ESC A	1B 41	Exit MPTP Mode
ESC B	1B 42	Enter Block Mode
ESC C	1B 43	Enter Conversational Mode
ESC E	1B 45	Insert Line
ESC G	1B 47	Set Video Attributes
ESC I	1B 49	Back Tab
ESC J	1B 4A	Back Page
ESC K	1B 4B	Advance Page
ESC N	1B 4E	Normal (unblanked) Screen
ESC O	1B 4F	Blank Screen
ESC P	1B 50	Print Page
ESC Q	1B 51	Insert Character
ESC R	1B 52	Delete Line
ESC S	1B 53	Send Message Unprotected
ESC T	1B 54	Erase EOL spaces
ESC U	1B 55	Enter Transparency Mode
ESC W	1B 57	Delete Character
ESC X	1B 58	Exit Transparency Mode
ESC Y	1B 59	Erase EOP spaces
ESC `	1B 60	Enter Printer Controller Mode
ESC a	1B 61	Exit Printer Controller Mode
ESC b	1B 62	Screen Background: Reverse
ESC d	1B 64	Screen Background: Normal

ESC f	1B 66	Load User Line
ESC g	1B 67	Display User Line
ESC h	1B 68	Disable 25th Line
ESC i	1B 69	Field Tab
ESC j	1B 6A	Reverse Linefeed
ESC k	1B 6B	Set Local Edit Mode
ESC l	1B 6C	Set Duplex Edit Mode
ESC p	1B 70	Set Print Termination Character
ESC s	1B 73	Send Message All
ESC t	1B 74	Erase EOL nulls
ESC u	1B 75	Exit Transparency Mode
ESC v	1B 76	Enable Auto Page
ESC w	1B 77	Exit Auto Page
ESC x	1B 78	Set Send Termination Character
ESC y	1B 79	Erase EOP nulls