# Freedom® ONE Series
# User's Guide

Freedom ONE  Freedom ONE Plus  Freedom ONE Turbo

# Introduction

## Introduction

This Guide provides you with all the information required to install the Freedom ONE, the Freedom ONE Plus, and the Freedom ONE Turbo. Should you require more detailed information regarding the terminal's features or programming, please consult the Freedom ONE Series Programmer's Manual.

For ordering information, write to Liberty Electronics U.S.A., 332 Harbor Way, South San Francisco, CA 94080.

## FCC NOTICE

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. However, there is no guarantee that interference will not occur in a particular installation. When operating this equipment with other equipment, shielded cables and ferrite core must be used on all interface cables.

# Table Of Contents

# Installing The Terminal

# 1

## 1.1 Unpacking

You should receive, with each terminal purchased, a terminal, a keyboard with keyboard cord, a power cord, and this User's Guide. Please inspect to make sure everything has been received and is undamaged. Any missing items should immediately be reported to the company from which you purchased the terminal.

Shipping damage must be reported immediately to the carrier who transported the terminal, and a claim filed with that carrier.

## 1.2 Connections

1. Make sure your location has a grounded three hole power outlet, and that the available voltage matches the voltage which appears on the back of your terminal.
2. Making sure the power switch is in the off position, plug the corresponding ends of the power cord into the back of the terminal and into the wall outlet.
3. Plug the small connector end of the coiled keyboard cord into the left side of the terminal housing.

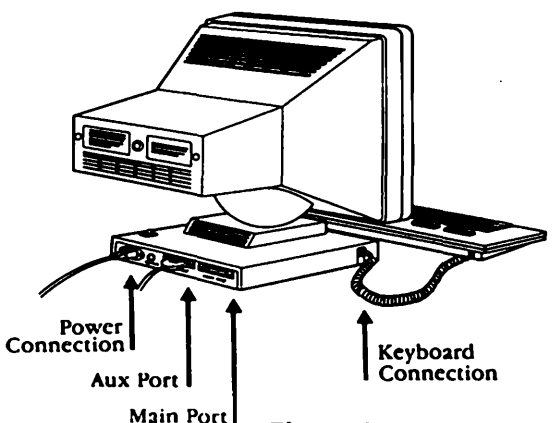



**Figure 1**

4. To connect the terminal to a host computer, a standard RS-232-C cable is needed. Plug this cable into the RS-232-C port labeled "MAIN." Please consult Appendix B for the RS-232-C pin functions if the computer requires a different set up.
5. To connect the terminal to a serial printer, connect the printer's RS-232-C cable to the port labeled "AUX."
6. To ensure proper connections, tighten the screws on both sides of each RS-232-C connector.

## 1.3 Turning The Terminal On

After properly connecting the terminal, turn it on by pressing down on the front half of the power switch located at the right rear on top of the terminal base.

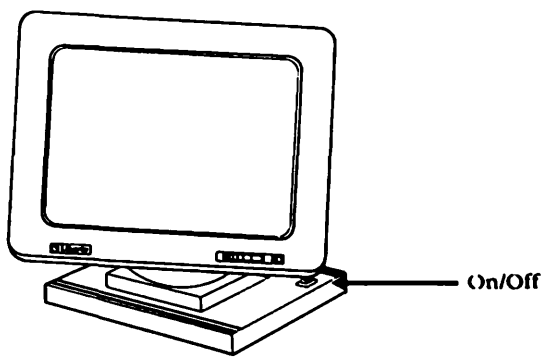



**Figure 2**

When turned on, a "beep" should be heard from the keyboard, the CRT screen should light up slowly with the cursor in the top left corner and the status line showing at the bottom.

As it powers up, the terminal goes through a self test routine. If an error code shows at the top of the screen consult the troubleshooting chart in section 4.

## 1.4 Adjusting The Terminal

**Brightness**— Adjust the screen brightness to your liking by sliding the brightness switch in the lower right corner to the right or left.

**Tilt and swivel**— The terminal can be adjusted so the screen is at a comfortable viewing angle independent of your height or position.

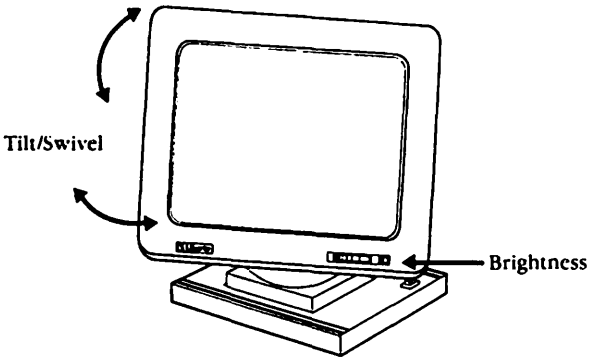



**Figure 3**

To tilt or swivel the screen, grasp opposite sides of the console's cabinet and firmly push the screen to the desired angle.

**Keyboard tilt**— Pull out the two adjustable feet on the bottom of keyboard if you desire more of an angle to the keyboard.

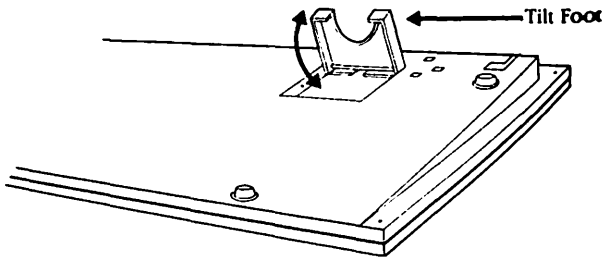



**Figure 4**

# Configuring The Terminal

# 2

## 2.1 General

Next, you must adapt the terminal to your computer to ensure proper communications. Two types of Set-Up modes are available for this purpose: Full Screen and Status Line.

Once in the Set-Up mode, the parameter to be changed is highlighted in reverse video. Use the cursor keys (← ↑ ↓ →) to move to the desired parameter. To change the parameter, press the SPACE bar. After the parameters are changed, you may wish to save them in non-volatile memory. If you don't, the changes will only be effective until you turn off the terminal. This ensures that when you turn your unit off and back on again, Set-Up parameter values will still be present. The parameter values can also be restored to their factory setting. The table *"How to Use Set-Up"* in your keyboard manual summarizes the keystrokes necessary to initiate the Set-Up functions.

### Freedom ONE Plus (ASCII)

MAIN PORT
- MODE
- SPEED
- PARITY
- DATA BITS
- STOP BITS
- SIGNAL AT
- DTR
- XON/XOFF
- XOFF =
- XON =
- ACK =

AUXILIARY PORT
- MODE
- SPEED
- PARITY
- DATA BITS
- STOP BITS
- DTR
- XON/XOFF
- BUFFER SIZE

BLOCK SEND
- FIELD MARK =
- LINE MARK =
- START PROTECT =
- END PROTECT =
- END OF MESSAGE =
- HANDSHAKE

DISPLAY
- LINES/PAGE
- COLUMNS
- AUTO PANNING
- STATUS LINE
- BACKGROUND
- SCROLL TYPE
- CURSOR TYPE
- LINE TRUNCATE
- AUTO NEW LINE
- AUTO SCROLL
- AUTO PAGE
- PROTECT
- INSERT CHAR =

KEYBOARD
- LAYOUT
- CLICK
- BELL TONE
- MARGIN BELL
- AUTO REPEAT
- DELAY
- LOCK TYPE
- LOCK SET
- WORDSTAR MODE
- EDIT DUPLEX
- EDIT MODE

MISCELLANEOUS
- SCREEN SAVER

EMULATION

Depress the "Funct" key for function key programming.

**Figure 5** Full Screen Menu Set-Up—Freedom ONE and Freedom ONE Plus (ASCII)

## 2.2 The Freedom ONE and the Freedom ONE Plus (ASCII Option)

Both Full Screen and Status Line Set-Ups are available for the Freedom ONE. The Full Screen Set-Up is shown in Figure 5. An explanation of each parameter may be found in Appendix H. The format of the different lines used in the Status Line Set-Up may be found in Appendix J.

## 2.3 The Freedom ONE Plus (ANSI Option)

Both full Screen and Status Line Set-Ups are available for the Freedom ONE. Full Screen Set-Up is shown in Figure 6.

An explanation of each parameter may be found in Appendix I. The formats of the different lines used in the Status Line Set-Up may be found in Appendix K.

**Freedom ONE Plus (ANSI)**

MAIN PORT
- MODE
- LOCAL ECHO
- RECEIVE SPEED
- TRANSMIT SPEED
- PARITY
- DATA BITS
- STOP BITS
- SIGNAL AT
- RECEIVE PROTOCOL
- TRANSMIT PROTOCOL
- XOFF =
- XON =

AUXILIARY PORT
- MODE
- SPEED
- PARITY
- DATA BITS
- STOP BITS
- PROTOCOL
- TERMINATOR

PRINT
- PRINT DATA
- BUFFER SIZE

DISPLAY
- LINES/PAGE
- COLUMNS
- AUTO PANNING
- STATUS LINE
- BACKGROUND
- CTRL CODES
- SCROLL TYPE
- CURSOR DISPLAY
- CURSOR TYPE
- LINE TRUNCATE
- AUTO NEW LINE
- AUTO SCROLL
- INSERT CHAR =

ANSWERBACK
- CONCEALED
- SELECT

KEYBOARD
- LAYOUT
- TYPE
- CLICK
- BELL TONE
- MARGIN BELL
- AUTO REPEAT
- DELAY
- LOCK TYPE
- LOCK SET
- USER FEATURES
- USER KEYS
- KEYPAD KEYS
- CURSOR KEYS
- COMPOSE KEY

MISCELLANEOUS
- SCREEN SAVER

EMULATION
- TYPE
- ENHANCE

Depress the "Compose" key for function key programming.

**Figure 6** Freedom ONE Plus Full Screen Set-Up—ANSI Emulations

## 2.4 The Freedom ONE Turbo

Both Full Screen and Status Line Set-Ups are available for The Freedom ONE. The Full Screen Set-Up has two pages. The first page is shown in Figure 7.

### Enhance

1. If you choose ADDS Viewpoint A2 emulation, you have the option of ENHANCE ON or OFF. ENHANCE ON adds WY-50 features to the standard Viewpoint A2 emulation.
2. If you choose any DEC emulation, ENHANCE also appears. Choosing ENHANCE ON allows additional keys to be programmed on the VT220 style keyboard. ENHANCE OFF allows the standard number of keys to be programmed.

### Resolution

Selection of any ANSI emulation mode will cause the RESOLUTION parameter to appear. RESOLUTION 10 × 10 selects the standard DEC character cell size. RESOLUTION 10 × 12 selects a higher resolution character cell size.

### Mode

Selection of any DASHER emulation will cause the MODE parameter to appear. MODE DG selects the native mode of the DASHER terminal selected. MODE ANSI selects the ANSI X3.64 mode in the DASHER terminal selected.

Once the correct emulation has been selected, press the F1 key to move to the second menu screen.

One of two second pages will appear, depending upon which emulation type was selected. If an ASCII emulation (any of column 1 of Figure 7) was selected, the second page will be displayed as in Figure 8. An explanation of each parameter in this screen may be found in Appendix H. If an ANSI emulation (any of column 2 or 3 of Figure 7) was selected, then the screen will appear as in Figure 9. An explanation of each of the parameters in this screen may be found in Appendix I. The format of the different lines used in the ASCII and ANSI Line Set-Ups may be found in Appendices J and K respectively.

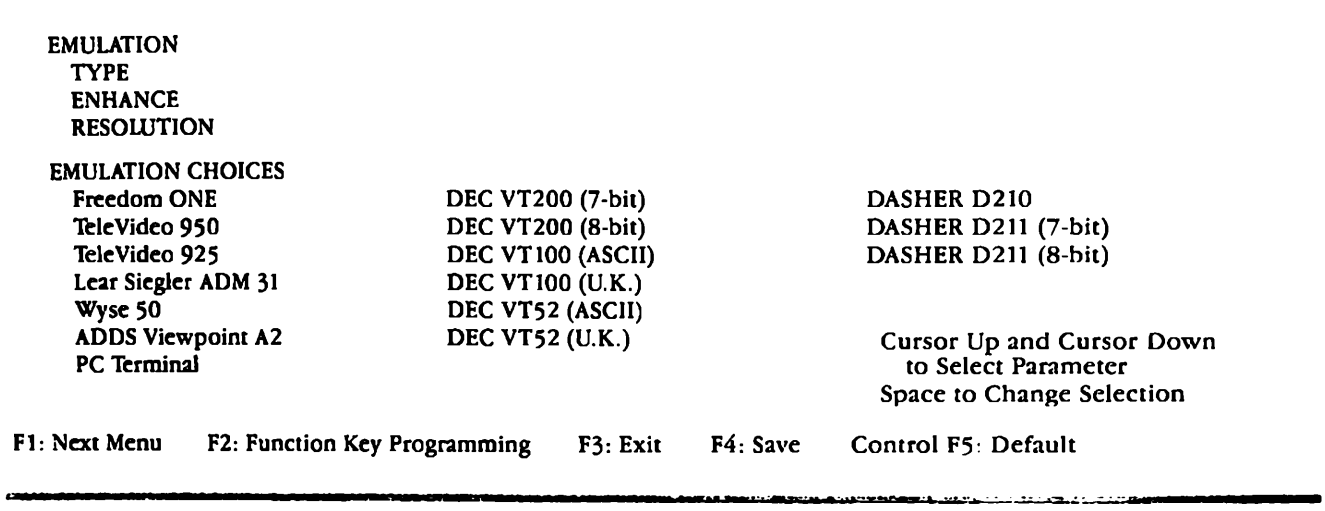



**Figure 7** Freedom ONE Turbo Full Screen Menu Set-Up—Emulation Choices

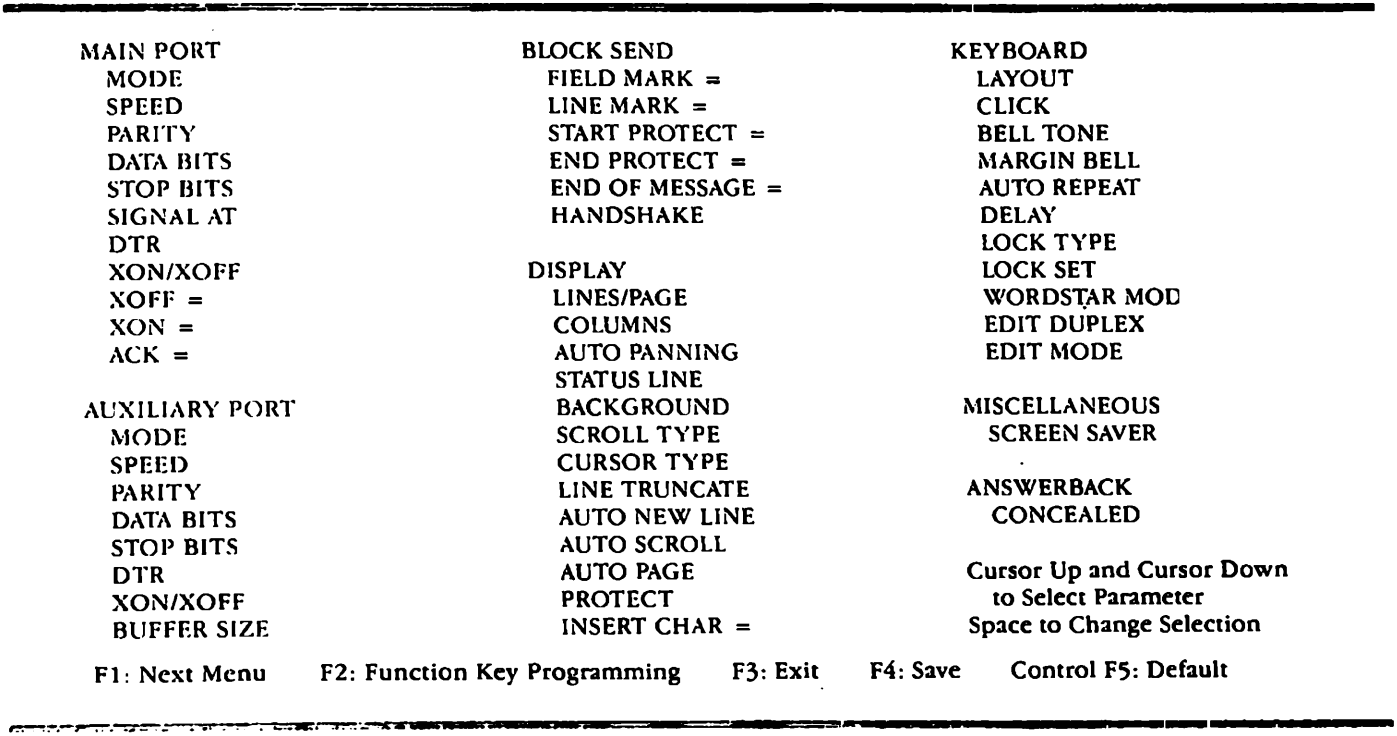



**Figure 8** Freedom ONE Turbo Full Screen Menu Set-Up—ASCII Emulations

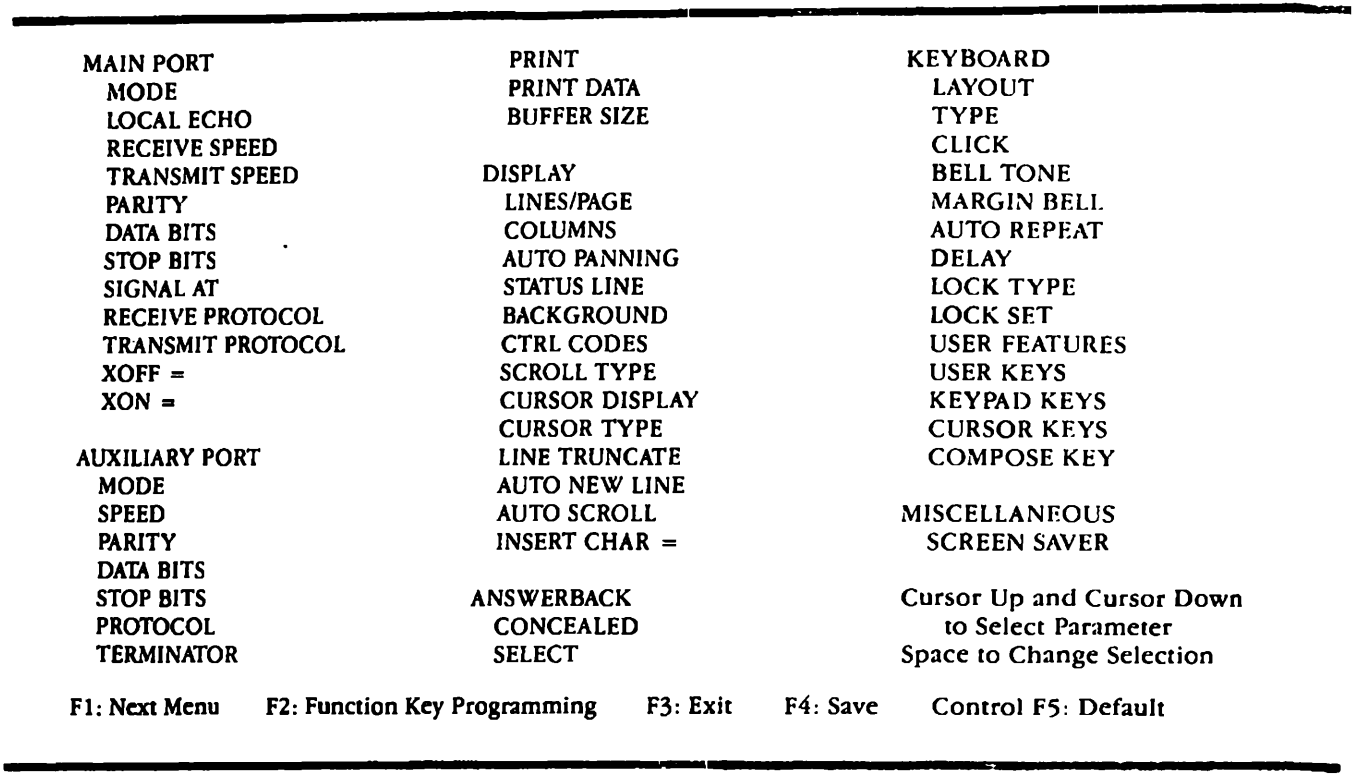



**Figure 9** Freedom ONE Turbo Full Screen Set-Up—ANSI Emulations

# Using The Terminal

# 3

## 3.1 Communicating With The Computer

The terminal supports four different modes of communication with the host computer through the main port. These four modes — Local, Half Duplex, Full Duplex, and Block — allow you to not only configure the terminal to match the host computer's communication protocol, but also help you to build and use forms for data entry systems. These communication modes are selected via Set-Up.

The Full and Half Duplex modes are used in conversation with the host computer with data transferring freely between the two. Both Block and Local modes restrict the communication between the host computer and the terminal. Because of this, the Full and Half Duplex modes are called the "conversational" modes of the terminal, and the Local and Block modes are called the "non-conversational" modes.

**Please Note:**
This discussion pertains to the terminal's native mode. Communications modes discussed may not all apply to all emulation modes.

The following is a more detailed explanation of the terminal's modes of communication. In all communications modes, the terminal examines all data and reevaluates any appropriate functions (i.e., the reprogrammable function keys) before sending data to the host computer of the screen.

### Full Duplex Mode

In this Mode, the terminal transmits every character typed in at the keyboard to the host computer via the Main RS-232-C Port on the back of the console. The host must then decide what to do in response to the character it has received. In the majority of cases, it simply echoes the character back to the terminal, and the terminal displays it on the screen (or takes some action, if it is a control character such as a carriage return). The host program may respond with a different character or characters, such as instructions for random cursor positioning.

In essence, the terminal sends character strings to the host, and then displays or executes whatever the host sends back.

### Half Duplex Mode

In this mode, the terminal sends character strings to the host computer, and displays or executes them without waiting for the host to echo them back. It also responds to strings of characters sent from the host, displaying or executing them, as appropriate.

### Local Mode

In local mode, the terminal does not communicate with the host computer. The terminal neither sends nor receives characters over the Main RS-232-C Port. It does, however, send and receive signals via the Auxiliary Port, so that you can compose text on the screen, and then send it to a Printer by pressing the Print key.

### Block Mode

In Block Mode, the terminal does not communicate with the host computer until you press the Enter or Send key. It does, however, respond to commands and characters received from the host.

## 3.2 Resetting The Terminal

The terminal may be reset in two ways:

1. Powering down and back up again using the power switch.
2. Pressing the Break key while holding down the Shift key.

The terminal resets to the Set-Up parameter values currently in non-volatile memory.

## 3.3 Calculator Mode

The terminal has a built-in 4 function calculator mode which performs 8 digit integer arithmetic. To enter Calculator mode press Set Up to enter status line Set-Up mode. Then press Ctrl, Shift and F6 simultaneously. You are now in Calculator mode. Values can be entered from the numeric keys at the top of the typewriter keypad only. Use the + key to add, the - key to subtract, the * key to multiply and the / to divide. The = key gives the result. To clear the last entry use the Del key. To exit Calculator mode press the Break key.

# Troubleshooting

4

lease consult the following chart for possible solutions
› terminal malfunctions. **WARNING:** Do not open the
erminal's case, except under the supervision of a quali-
ied repair person. There are dangerously high voltages
nside the case. Since there are no controls or adjustments
nside the case which a user would need to change,
lways leave this to qualified service and repair people.

## Troubleshooting Chart

| Symptom | Might Be | Try |
|---|---|---|
| **1. Escape or control sequence does not work** | Incorrect sequence used | ■ Turn off Caps Lock<br>■ Use local escape sequence (<Shift-Esc>)<br>■ Hold down Ctrl key while entering sequence |
| **2. Double characters appear on screen** | Wrong duplex mode | ■ Change to full duplex transmission |
| | Auto key repeat to fast | ■ Reduce auto-repeat rate |
| **3. Terminal receives but does not send** | Block mode of operation | ■ Remove Block mode with <ESC><C> or in Set-Up Mode |
| **4. User Line does not display** | 25th line not enabled | ■ Enable 25th line with <ESC><CTRL-O> |
| **5. Character loss at high Baud rates** | System may need handshaking protocol | ■ Enable hardware or software handshaking for your system<br>■ Reduce baud rate<br>■ Use jump scroll instead of smooth scroll |
| **6. Characters are not always correct** | Parity incorrect | ■ Change parity |

## Troubleshooting Chart *(Continued)*

| Symptom | Might Be | Try |
|---|---|---|
| **7. Terminal does not receive characters correctly** | Stop bits, data bits, or Baud rate may be incorrect | ■ Check your system requirement<br>■ Hint—switch protocol to 1 stop bit, no parity and 8 data bits (this is the most common configuration) |
| **8. Terminal dead (no cursor,no beep)** | No power | ■ Check Power cord, unplug at both ends, and replace<br>■ Make sure power setting is correct |
| **9. Cursor does not appear** | Cursor attribute set to off | ■ Reset cursor attribute in Set-Up mode<br>■ Check Brightness slide switch |
| **10. Terminal does not go on line** | System not ready | ■ Check system status |
| | Disconnected cables | ■ Make sure cables are secure<br>■ Check continuity of cable<br>■ Make sure half duplex or full duplex is enabled |
| | Incorrect cable connections | ■ Check system cable requirements |
| **11. No keyboard response** | Duplex set incorrectly | ☑ Change to full duplex |
| | Keyboard disconnected | ■ Reconnect keyboard cable<br>■ Check for cable damage<br>■ Check for connector damage<br>■ Make sure keyboard is enabled enter <ESC> < " > |

## Troubleshooting Chart *(Continued)*

| Symptom | Might Be | Try |
|---|---|---|
| **12. Terminal locked up** | Keyboard disabled | ☐ Enable keyboard with <ESC><"> |
| | Print or send mode engaged | ☐ Reset terminal with <Shift-Break> |
| **13. Printer does not print correctly from Aux Port** | Incorrect data structure | ☐ Review printer data structure requirements |
| | Cable loose or damaged | ☐ Check cable for damage and loose connections |
| | Printer Buffer too small | ☐ Increase terminals printer buffer |
| | Handshaking protocol not correct | ☐ Review printer's handshaking signals and reconfigure in Set-Up mode |
| **14. Default Parameters are not saved** | Parameters not saved after set-up | ☐ Make sure <Ctrl-Set Up> is entered after set up parameters are selected |
| | | ☐ Make service call to obtain new battery for memory system |
| **15. Error code appears on top line of screen** | Various electrical malfunctions | ☐ Contact authorized service personnel |

## Command Codes — Alphabetic by Function

| Function | Freedom ONE Command | ADM 31 Command |
|---|---|---|
| Auto Page Disable | ESC w | ESC w |
| Auto Page Enable | ESC v | ESC v |
| Auto Scroll Enable/Disable | ESC H | |
| Back Tab | ESC I | ESC I |
| Bell Tone Disable | ESC _ | |
| Bell Tone Enable | ESC ^ | |
| Bidirectional Port Disable | CTRL T | |
| Bidirectional Port Enable | CTRL R | |
| Carriage Return | CTRL M | CTRL M |
| Clear All to Null | ESC * | ESC * or ESC : |
| Clear All Typewriter Tabs | ESC 3 | ESC 0 |
| Clear Typewriter Tab | ESC 2 | ESC 2 |
| Clear Unprotected to Insert Character | ESC + | ESC + |
| | ESC ; | ESC ; |
| | CTRL Z | |
| Clear Unprotected to Null | ESC : | |
| Clear Unprotected to Write Protected Insert Character | ESC , | ESC , |
| Configure Auxiliary Port | ESC } p1 p2 p3 p4 | |
| Configure Main Port | ESC { p1 p2 p3 p4 | |
| Conversational Mode Enable | ESC C | ESC C |
| Copy Print Disable | ESC A | ESC A 0 |
| Copy Print Enable | ESC @ | ESC A 1 |
| Cursor Down | CTRL V | |
| Cursor Home | CTRL ^ | CTRL ^ |
| Cursor Left | CTRL H | CTRL H |
| Cursor Right | CTRL L | CTRL L |
| Cursor Up | CTRL K | CTRL K |
| Delete Character | ESC W | ESC W |
| Delete Line | ESC R | ESC R |
| Display Control Character | ESC F (char) | |
| Display Graphics Character | ESC CTRL G (char) | |
| Display Next Page | ESC K | ESC K |
| Display Previous Page | ESC J | ESC J |
| Display Status Line | ESC h | |

# Appendix A

| TVI 925 Command | TVI 950 Command | VIEWPOINT A2 Command | WY 50 Command | PC Terminal Command |
|---|---|---|---|---|
| | ESC w | | | ESC w |
| | ESC v | | | ESC v |
| | | ENH | | |
| ESC I | ESC I | ENH | ESC I | ESC I |
| | CTRL T | | | CTRL T |
| | CTRL R | | | CTRL R |
| CTRL M | CTRL M | CTRL M | CTRL M | CTRL M |
| ESC * | ESC * | CTRL L | ESC * | ESC * |
| ESC 3 | ESC 3 | | ESC 0 or ESC 3 | ESC 3 |
| ESC 2 | ESC 2 | ENH | ESC 2 | ESC 2 |
| ESC + | ESC + | ENH | ESC + | ESC + |
| ESC ; | ESC ; | ENH | ESC ; | ESC ; |
| CTRL Z | CTRL Z | | CTRL Z | CTRL Z |
| ESC : | ESC : | ENH | ESC : | ESC : |
| ESC , | ESC , | ENH | ESC , | ESC , |
| | ESC } pl p2 p3 p4 | | | |
| | ESC { pl p2 p3 p4 | | | |
| ESC C | ESC C | ENH | ESC C | |
| ESC A | ESC A | CTRL T | CTRL T | ESC A |
| ESC @ | ESC @ | CTRL R | CTRL R | ESC @ |
| CTRL V | CTRL V | CTRL J | CTRL J | CTRL V |
| ESC { or CTRL [ | CTRL ^ | CTRL A | ESC { or CTRL ^ | CTRL ^ |
| CTRL H | CTRL H | CTRL H or CTRL U | CTRL H | CTRL H |
| CTRL L | CTRL L | CTRL F | CTRL L | CTRL L |
| CTRL K | CTRL K | CTRL Z | CTRL K | CTRL K |
| ESC W | ESC W | ENH | ESC W | ESC W |
| ESC R | ESC R | ENH | ESC R | ESC R |
| ESC H (char) | | ENH | ESC H (char) | |
| ESC H (char) | | ENH | ESC H (char) | |
| ESC K | ESC K | | ESC K | |
| ESC J | ESC J | | ESC J | |
| | ESC h | | | |

## Command Codes — Alphabetic by Function

| Function | Freedom ONE Command | ADM 31 Command |
|---|---|---|
| **Display Tab Status** | ESC CTRL T | |
| **Display User Line** | ESC g | |
| **DTR Handshake Disable** | ESC DEL | |
| **DTR Handshake Enable** | ESC ~ | |
| **Escape: Lead-In for Escape Sequences** | CTRL [ | CTRL [ |
| **Erase to End of Line** | ESC T | ESC T |
| **Erase to End of Line with Null** | ESC t | ESC t |
| **Erase to End of Page** | ESC Y | ESC Y |
| **Erase to End of Page with Null** | ESC y | ESC y |
| **Field Tab** | ESC i | ESC i |
| **Formatted Print** | ESC P | ESC P |
| **Graphics Mode Disable** | ESC % | ESC G 0 |
| **Graphics Mode Enable** | ESC S | ESC G 8 |
| **Insert Character** | ESC Q | ESC Q |
| **Insert Line** | ESC E | ESC E |
| **Insert Mode Disable** | ESC r | ESC r |
| **Insert Mode Enable** | ESC q | ESC q |
| **Key Click Disable** | ESC < | |
| **Key Click Enable** | ESC > | |
| **Keyboard Disable** | ESC # | ESC # |
| **Keyboard Enable** | ESC " | ESC " |
| **Line Feed** | CTRL J | CTRL J |
| **Line Lock/Unlock** | ESC ! n | |
| **Load Answerback Message** | ESC CTRL E (dlmt)(msg)(dlmt) | |
| **Load Insert Character** | ESC e (char) | ESC . 8 |
| **Load Print Acknowledge Character** | ESC CTRL F (char) | |
| **Load Set-Up Parameters** | ESC CTRL B (msg) | |
| **Load User Line** | ESC f (msg) | |
| **Load X-Off Character** | ESC CTRL S (char) | |
| **Load X-On Character** | ESC CTRL Q (char) | |
| **Local Edit Mode Disable** | ESC l | |
| **Local Edit Mode Enable** | ESC k | |
| **Monitor Mode Disable** | ESC X<br>ESC u | ESC X<br>ESC u |

# Appendix A

| TVI 925 Command | TVI 950 Command | VIEWPOINT A2 Command | WY 50 Command | PC Terminal Command |
|---|---|---|---|---|
| | ESC g | | | |
| CTRL O | CTRL O | | | |
| CTRL N | CTRL N | | | |
| CTRL [ | CTRL [ | CTRL [ | CTRL [ | CTRL [ |
| ESC T | ESC T | ESC K | ESC T | ESC T |
| ESC t | ESC t | ENH | ESC t | ESC t |
| ESC Y | ESC Y | ESC k | ESC Y | ESC Y |
| ESC y | ESC y | ENH | ESC y | ESC y |
| ESC i | ESC i | ENH | ESC i | ESC i |
| ESC P | ESC P | ESC X | ESC P | ESC P |
| ESC H CTRL C | ESC % | ENH | ESC H CTRL C | ESC % |
| ESC H CTRL B | ESC $ | ENH | ESC H CTRL B | ESC $ |
| ESC Q | ESC Q | ENH | ESC Q | ESC Q |
| ESC E | ESC E | ENH | ESC E | ESC E |
| ESC r | ESC r | ENH | ESC r | ESC r |
| ESC q | ESC q | ENH | ESC q | ESC Z |
| | ESC < | | | ESC < |
| | ESC > | | | ESC > |
| ESC # | ESC # | ESC 5 | ESC # | ESC # |
| ESC " | ESC " | ESC 6 | ESC " | ESC " |
| CTRL J | CTRL J | CTRL J | CTRL J | CTRL J |
| | ESC ! n | | | |
| | ESC e (char) | | | |
| ESC F (msg) | ESC f (msg) | ESC c (msg) | ESC F (msg) | |
| ESC l | ESC l | ENH | ESC l | |
| ESC k | ESC k | ENH | ESC k | |
| ESC X | ESC X | ENH | ESC X | ESC X |
| ESC u | ESC u | ENH | ESC u | ESC u |

# ASCII Command Codes *(Continued)*

## Command Codes — Alphabetic by Function

| Function | Freedom ONE Command | ADM 31 Command |
|---|---|---|
| **Monitor Mode Enable** | ESC U | ESC U |
| **New Line** | CTRL ___ | CTRL ___ |
| **Program Function Key** | ESC \| p1 p2 (msg) CTRL Y | |
| **Program Print Boundaries** | ESC CTRL P p1 | |
| **Program Send Key** | ESC 0 p1 p2 | |
| **Protect Mode Disable** | ESC ' | ESC ' |
| **Protect Mode Enable** | ESC & | ESC & |
| **Read Cursor Address** | ESC / | ESC / |
| **Read Cursor Character** | ESC CTRL C | |
| **Read Cursor Position** | ESC ? | ESC ? |
| | ESC CTRL ___ | ESC CTRL ___ |
| **Reverse Line Feed** | ESC j | |
| **Ring Bell** | CTRL G | CTRL G |
| **Save/Restore Cursor Address** | ESC CTRL U n | |
| **Screen Display Off** | ESC o | |
| **Screen Display On** | ESC n | |
| **Select 80/132 Display Columns** | ESC CTRL V n | |
| **Select Block Mode** | ESC B | ESC B |
| **Select Character Attribute** | ESC G n | ESC G n |
| **Select Cursor Attribute** | ESC . n | |
| **Select Data Entry Attribute** | ESC CTRL D n | |
| **Select Duplex Mode** | ESC D (mode) | ESC D (mode) |
| **Select Line Attribute** | ESC CTRL L n | |
| **Select Line Edit** | ESC O | |
| **Select Lines Per Page** | ESC \ n | |
| **Select Local Mode** | ESC c | |
| **Select Normal Video** | ESC d | |
| **Select Page Edit** | ESC N | |
| **Select Print Buffer Size** | ESC CTRL J n | |
| **Select Reverse Video** | ESC b | |
| **Select Scrolling Region** | ESC m p1 p2 p3 | |
| **Select Write Protect Attribute** | ESC p n | |
| **Send Answerback Message** | CTRL E | |
| **Send Form All** | ESC CTRL R | |

# Appendix A

| TVI 925 Command | TVI 950 Command | VIEWPOINT A2 Command | WY 50 Command | PC Terminal Command |
|---|---|---|---|---|
| ESC U<br>CTRL __<br>ESC z n (msg)<br><DEL> | ESC U<br>CTRL __<br>ESC \| p1 p2 (msg)<br>CTRL Y | ENH<br><br>ENH | ESC U<br>CTRL __<br>ESC z n (msg)<br><DEL> | ESC U<br>CTRL __<br>ESC \| p1 p2 (msg)<br>CTRL Y |
| | ESC 0 p1 p2 | | | |
| ESC ´ | ESC ´ | ENH | ESC ´ | ESC ´ |
| ESC & | ESC & | ENH | ESC & | ESC & |
| ESC / | ESC / | ENH | ESC / | ESC / |
| ESC M | | | ESC M | |
| ESC ? | ESC ? | ENH | ESC ? | ESC ? |
| ESC b | ESC CTRL __ | ENH | ESC b | |
| ESC j | ESC j | ENH | ESC j | ESC j |
| CTRL G | CTRL G | CTRL G | CTRL G | CTRL G |
| ESC .8 | ESC o | ENH | ESC ` 8 | ESC O |
| ESC .9 | ESC n | ENH | ESC ` 9 | ESC N |
| ESC .n | | ENH | ESC ` n | |
| ESC B | ESC B | ENH | ESC B | |
| ESC G n | ESC G n | ENH | ESC G n | ESC G n |
| ESC . n | ESC . n | ENH | ESC ` n | ESC . n |
| ESC D (mode) | ESC D (mode) | ENH | ESC D (mode) | |
| | ESC O | | | |
| | ESC \ n | | | |
| | ESC c | | | |
| | ESC d | | | ESC d |
| | ESC N | | | |
| | ESC b | | | ESC b |
| ESC .n | | ESC 0 n | ESC ` n | |

# ASCII Command Codes *(Continued)*

## Command Codes — Alphabetic by Function

| Function | Freedom ONE Command | ADM 31 Command |
|---|---|---|
| **Send Line All** | ESC 6 | ESC 6 |
| **Send Line Unprotected** | ESC 4 | ESC 4 |
| **Send Message All** | ESC s | |
| **Send Message Unprotected** | ESC S | ESC S |
| **Send Page All** | ESC 7 | ESC 7 |
| **Send Page Unprotected** | ESC 5 | ESC 5 |
| **Send Set-Up Parameters** | ESC CTRL A | |
| **Send Terminal ID** | ESC M | ESC o |
| **Send 25th Line** | ESC Z n | |
| **Set Cursor Address** | ESC - prc | ESC - prc |
| **Set Cursor Column** | ESC ] c | |
| **Set Cursor Position** | ESC = rc | ESC = rc |
| | ESC CTRL ] | ESC CTRL ] |
| | rr R ccc C | rr R ccc C |
| **Set Cursor Row** | ESC [ r | |
| **Set Send Delimiters** | ESC x n p1 p2 | |
| **Set Tab** | ESC 1 | ESC 1 |
| **Smooth Scroll Disable** | ESC 9 | |
| **Smooth Scroll Enable** | ESC 8 | |
| **Tab** | CTRL I | CTRL I |
| **Tab by Word** | ESC CTRL W n | |
| **Transparent Print Disable** | ESC a | |
| **Transparent Print Enable** | ESC ` | |
| **Twenty-fifth Line Disable** | ESC CTRL N | |
| **Twenty-fifth Line Enable** | ESC CTRL O | |
| **Unformatted Print** | ESC L | ESC L |
| **Write Protect Attribute Disable** | ESC ( | ESC ( |
| **Write Protect Attribute Enable** | ESC ) | ESC ) |
| **X-On/X-Off Disable** | CTRL N | |
| **X-On/X-Off Enable** | CTRL O | |

# Appendix A

| TVI 925 Command | TVI 950 Command | VIEWPOINT A2 Command | WY 50 Command | PC Terminal Command |
|---|---|---|---|---|
| ESC 6 | ESC 6 | ENH | ESC 6 | ESC 6 |
| ESC 4 | ESC 4 | ENH | ESC 4 | ESC 4 |
| ESC s | ESC s | ENH | ESC s | ESC s |
| ESC S | ESC S | ENH | ESC S | ESC S |
| ESC 7 | ESC 7 | ENH | ESC 7 | ESC 7 |
| ESC 5 | ESC 5 | ENH | ESC 5 | ESC 5 |
| ESC <Space> | ESC M<br>ESC Z n | ENH | ESC <Space> | |
| ESC - prc | ESC - prc | ENH | ESC - prc | ESC - prc |
| | | CTRL P c | | |
| ESC = rc | ESC = rc | ESC Y rc | ESC = rc | |
| ESC d | ESC CTRL ] | ENH | ESC a | |
| rr R ccc C | rr R ccc C | | rr R ccc C | |
| | | CTRL K r | | |
| | ESC x n pl p2 | | | |
| ESC 1 | ESC 1 | ENH | ESC 1 | ESC 1 |
| ESC .@ | ESC 9 | ESC J | ESC `@ | |
| ESC .n | ESC 8 | ESC i | ESC ` n | |
| CTRL I | CTRL I | CTRL I | CTRL I | CTRL I |
| ESC a | ESC a | ESC 4 | CTRL T | ESC a |
| ESC ` | ESC ` | ESC 3 | CTRL X | ESC ` |
| | | ESC n | | |
| | | ESC N | | |
| ESC L or ESC p | ESC L | ENH | ESC L or ESC p | ESC L |
| ESC ( | ESC ( | CTRL O | ESC ( | ESC ( |
| ESC ) | ESC ) | CTRL N | ESC ) | ESC ) |
| CTRL N | CTRL N | | | CTRL N |
| CTRL O | CTRL O | | | CTRL O |

# ANSI (DEC) Command Codes

## List of DEC VT52 Command Codes—Alphabetical by CTRL/ESC Sequence

| Function | Command |
|---|---|
| Send Answerback Message | CTRL E |
| Ring Bell | CTRL G |
| Cursor Left | CTRL H |
| Tab | CTRL I |
| Line Feed | CTRL J |
| Vertical Tabulation (same as line feed) | CTRL K |
| Form Feed (same as line feed) | CTRL L |
| Carriage Return | CTRL M |
| Escape: Lead-in for Escape Sequences | CTRL [ |
| ANSI Mode Enable | ESC < |
| Alternate Numeric Keypad Mode Enable | ESC = |
| Alternate Numeric Keypad Mode Disable | ESC > |
| Cursor Up | ESC A |
| Cursor Down | ESC B |
| Cursor Right | ESC C |
| Cursor Left | ESC D |
| Graphics Mode Enable | ESC F |
| Graphics Mode Disable | ESC G |
| Cursor Home | ESC H |
| Reverse Line Feed | ESC I |
| Erase to End of Page | ESC J |
| Erase to End of Line | ESC K |
| Print Cursor Line | ESC V |
| Printer Controller Mode Enable | ESC W |
| Printer Controller Mode Disable | ESC X |
| Set Cursor Position | ESC Y rc |
| Send Terminal ID | ESC Z |
| Print Screen | ESC ] |
| Auto Print Mode Enable | ESC ^ |
| Auto Print Mode Disable | ESC _ |

# Appendix B

## Command Codes—Alphabetic by Function

## DEC Command Codes

### Character Set Selection

| Function | Command |
|---|---|
| Designate G0 as ASCII. | ESC ( B |
| Designate G1 as ASCII. | ESC ) B |
| Designate G2 as ASCII. (VT200 mode only) | ESC * B |
| Designate G3 as ASCII. (VT200 mode only) | ESC + B |
| Designate G0 as DEC Supplemental. (VT200 mode only) | ESC ( < |
| Designate G1 as DEC Supplemental. (VT200 mode only) | ESC ) < |
| Designate G2 as DEC Supplemental. (VT200 mode only) | ESC * < |
| Designate G3 as DEC Supplemental. (VT200 mode only) | ESC + < |
| Designate G0 as U.K. National. (VT100 mode only) | ESC ( A |
| Designate G1 as U.K. National. (VT100 mode only) | ESC ) A |
| Designate G0 as Special Graphics. | ESC ( 0 |
| Designate G1 as Special Graphics. | ESC ) 0 |

## Command Codes—Alphabetic by Function
## DEC Command Codes

**Character Set Selection** *(Continued)*

| Function | Command |
|---|---|
| **Designate G2 as Special Graphics. (VT200 mode only)** | ESC * 0 |
| **Designate G3 as Special Graphics. (VT200 mode only)** | ESC + 0 |
| **Invokes G1 character set into GL.** | SO (CTRL N) |
| **Invokes G0 character set into GL.** | SI (CTRL O) |
| **Temporarily invokes G2 character set into GL for the next graphic character.** | SS2 (ESC N) |
| **Temporarily invokes G3 character set into GL for the next graphic character.** | SS3 (ESC O) |
| **Invokes G1 character set into GR. (VT200 mode only)** | ESC ~ |
| **Invokes G2 character set into GL. (VT200 mode only)** | ESC n |
| **Invokes G2 character set into GR. (default) (VT200 mode only)** | ESC } |
| **Invokes G3 character set into GL. (VT200 mode only)** | ESC o |
| **Invokes G3 character set into GR. (VT200 mode only)** | ESC \| |

# Appendix B

## Cursor Positioning

| Function | Command |
|---|---|
| Moves the cursor up Pn lines. | CSI Pn A |
| Moves the cursor down Pn lines. | CSI Pn B |
| Moves the cursor right Pn columns. | CSI Pn C |
| Moves the cursor left Pn columns. | CSI Pn D |
| Moves the cursor to line Pl column Pc. | CSI Pl ; Pc H |
| Same as above. | CSI Pl; Pc f |
| Moves the cursor down one line. | IND or ESC D |
| Moves the cursor up one line. | RI or ESC M |
| Moves the cursor to the first position on the next line. | NEL or ESC E |
| Saves in terminal memory the<br>—cursor position<br>—graphic rendition<br>—character set shift state<br>—state of wrap flag<br>—state of origin mode<br>—state of selective erase | ESC 7 |
| Restores the states described above. | ESC 8 |

## Command Codes—Alphabetic by Function

## DEC Command Codes

### Downline Loadable Character Set

| Function | Command |
|---|---|
| Designates G0 as soft character set. | ESC ( Dscs |
| Designates G1 as soft character set. | ESC ) Dscs |
| Designates G2 as soft character set. | ESC * Dscs |
| Designates G3 as soft character set. | ESC + Dscs |

### Editing

| | |
|---|---|
| Inserts Pn lines at the cursor. | CSI Pn L |
| Deletes Pn lines starting at the line with the cursor. | CSI Pn M |
| Inserts Pn blank characters at the cursor position. | CSI Pn @ |
| Deletes Pn characters starting at the cursor position. | CSI Pn P |

### Emulation Mode Selection (VT200, VT100, and VT52)

| | |
|---|---|
| Set terminal to VT100 mode. | CSI 6 1 " p |
| Set terminal to VT200 8-bit controls mode. | CSI 6 2 " p |
| Set terminal to VT200 8-bit controls mode. | CSI 6 2 ; 0 " p |
| Set terminal to VT200 7-bit controls mode. | CSI 6 2 ; 1 " p |
| Set terminal to VT200 8-bit controls mode. | CSI 6 2 ; 2 " p |
| Set terminal to VT52 compatible mode. | CSI ? 2 l |

# Appendix B

## Erasing Control

| Function | Command |
|---|---|
| All erase attributes off. | CSI 0 " q |
| Designates following characters to be non-erasable. | CSI 1 " q |
| Designates following characters to be erasable. | CSI 2 " q |
| Erases characters at the cursor position and the next n–1 characters. | CSI Pn X |
| Erases from the cursor to the end of the line including the cursor position. | CSI K |
| Same as above. | CSI 0 K |
| Erases from the beginning of the line to the cursor including the cursor position. | CSI 1 K |
| Erases the complete line. | CSI 2 K |
| Erases from the cursor to the end of the screen. | CSI J |
| Same as above. | CSI 0 J |
| Erases from the beginning of the screen to the cursor. | CSI 1 J |
| Erases the complete display. | CSI 2 J |
| Erases all erasable characters from the cursor to the end of line. | CSI ? K |
| Same as above. | CSI ? 0 K |
| Erases all erasable characters from the beginning of the line to and including the cursor position. | CSI ? 1 K |
| Erases all erasable characters on the line. | CSI ? 2 K |

## Command Codes—Alphabetic by Function

### DEC Command Codes

#### Erasing Control *(Continued)*

| Function | Command |
|---|---|
| Erases all erasable characters from and including the cursor to the end of the screen. | CSI ? J |
| Same as above. | CSI ? 0 J |
| Erases all erasable characters from the beginning of the screen to and including the cursor position. | CSI ? 1 J |
| Erases all erasable characters on the screen. | CSI ? 2 J |

#### Line Attributes

| | |
|---|---|
| Makes line with cursor the top half of a double-high, double-wide line. | ESC # 3 |
| Makes line with cursor the bottom half of a double-high, double-wide line. | ESC # 4 |
| Makes line cursor single-high, single-wide. | ESC # 5 |
| Makes line cursor single-high, double-wide. | ESC # 6 |

#### Print Control

| | |
|---|---|
| Turns on auto print mode. | CSI ? 5 i |
| Turns off auto print mode. | CSI ? 4 i |
| Turns on printer controller mode. | CSI 5 i |
| Turns off printer controller mode. | CSI 4 i |

# Appendix B

## Print Control *(Continued)*

| Function | Command |
|---|---|
| Prints the display line containing the cursor. | CSI ? 1 i |
| Prints the full screen or scroll region. | CSI i |
| Same as above. | CSI 0 i |
| Selects full screen to print during a print screen. | CSI ? 1 9 h |
| Selects scrolling region to print during a print screen operation. | CSI ? 1 9 l |
| Selects form feed as print termination character. | CSI ? 1 8 h |
| Selects no print termination character. | CSI ? 1 8 l |

## Reports

### Device Attributes

| | |
|---|---|
| Request for terminal service class code and attributes. | CSI c |
| Same as above. | CSI 0 c |
| Same as above. | ESC Z |
| | The terminal responds with |
| This says that the terminal is a class 2 (VT200 family) terminal (62) with 132 columns (1), printer port (2), selective erase (6), DRCS (7), and UDK (8). | CSI ? 62; 1; 2; 6; 7; 8 c |

## Command Codes—Alphabetic by Function
## DEC Command Codes

### Device Attribute *(Continued)*

| Function | Command |
|---|---|
| **Request for terminal firmware version and hardware options.** | CSI > c |
| **Same as above.** | CSI > 0 c |
| | The terminal responds with |
| **Pv = firmware version**<br>**Po = options installed** | CSI > 1; Pv; Po c |

### Device Status Report

| | |
|---|---|
| **Request to report operating status using a DSR control sequence.** | CSI 5 n<br>Terminal responds with |
| **No malfunction.** | CSI 0 n |
| **Malfunction.** | CSI 3 n |
| **Request to report cursor position using a CPR control sequence.** | CSI 6 n<br>Terminal responds with |
| **Pv = vertical position**<br>**Ph = horizontal position** | CSI Pv; Ph R |
| **Request for printer status.** | CSI ? 15 n |
| | Terminal responds with |
| **DTR has not been asserted on the printer port since power-up or reset.** | CSI ? 13 n |
| **DTR is asserted on the printer port.** | CSI ? 10 n |
| **DTR is not currently asserted on the printer port.** | CSI ? 11 n |

# Appendix B

## Device Status Report *(Continued)*

| Function | Command |
|---|---|
| Request for state of user defined keys. | CSI ? 25 n |
| | Terminal responds with |
| User defined keys are unlocked. | CSI ? 20 n |
| User defined keys are locked. | CSI ? 21 n |

## Reset

| | |
|---|---|
| Soft reset. | CSI ! p |
| Hard reset. | ESC c |

## Scrolling Margins

| | |
|---|---|
| Select home position with line numbers starting at top margin of the user scrolling region. | CSI ? 6 h |
| Select home position in upper-left corner or screen. | CSI ? 6 l |
| Selects top and bottom margins defining the scroll region. | CSI Pt ; Pb r |

## Select Character Attribute

| | |
|---|---|
| Allows characters to be erasable or non-erasable. | CSI Ps " q |

## Command Codes—Alphabetic by Function

### DEC Command Codes

#### Select Graphic Rendition

| Function | Command |
|---|---|
| Selects characters renditions. | CSI Ps ; ... Ps m |

#### Tab Control

| | |
|---|---|
| Sets a tab stop at the current column. | HTS or ESC H |
| Clears a horizontal tab stop at cursor position. | CSI g |
| Same as above. | CSI 0 g |
| Clears all horizontal tab stops. | CSI 3 g |

#### Terminal Modes

| | |
|---|---|
| Selects insert mode. | CSI 4 h |
| Selects replace mode. | CSI 4 l |
| Causes the cursor to be visible. | CSI ? 2 5 h |
| Causes the cursor to be invisible. | CSI ? 2 5 l |
| Selects 132 columns per line. | CSI ? 3 h |
| Selects 80 columns per line. | CSI ? 3 l |
| Selects smooth scroll. | CSI ? 4 h |
| Selects jump scroll. | CSI ? 4 l |
| Selects reverse video. | CSI ? 5 h |
| Selects normal screen. | CSI ? 5 l |

# Appendix B

**Terminal Modes** *(Continued)*

| Function | Command |
|---|---|
| Selects auto wrap. Characters received when the cursor is at the right margin appear on the next line. | CSI ? 7 h |
| Turns off auto wrap. | CSI ? 7 l |
| Selects auto repeat mode. | CSI ? 8 h |
| Turns off auto repeat. | CSI ? 8 l |
| Selects application keypad mode. | ESC = |
| Selects numeric keypad mode. | ESC > |
| Causes all C1 codes returned to the application to be converted to their equivalent 7-bit code extensions. | ESC sp F |
| Causes terminal to return C1 codes to the application without converting them to their equivalent 7-bit code extensions. | ESC sp G |
| Turns off local echo. | CSI 1 2 h |
| Turns on local echo. | CSI 1 2 l |
| Locks the keyboard. | CSI 2 h |
| Unlocks the keyboard. | CSI 2 l |
| Return transmits both a CR and a LF. | CSI 2 0 h |
| Return transmits only a CR. | CSI 2 0 l |
| Causes the cursor keys to generate application control functions. | CSI ? 1 h |
| Causes the cursor keys to generate ANSI cursor control sequences. | CSI ? 1 l |

## Command Codes—Alphabetic By Function

## DEC Command Codes

### User Defined Keys

| Function | Command |
|---|---|
| **Format for down-line loading UDK functions.** | DCS Pc ; Pl \| ky1 / st1 ; ... kyn / stn ST |

### Down-Line Loading Characters

| | |
|---|---|
| **Format for down-line loading DRCS character set.** | DCS Pfn;Pcn;Pe;Pcms;Pw;Pt{ Dscs Sxbp1; ... Sxbpn ST |

# DG Command Codes

# Appendix C

## Command Codes—Alphabetic By Function

## Data General Command Codes

| Function | ASCII Mode Command | ANSI Mode Command |
|---|---|---|
| Bell | CTRL G | CTRL G |
| Blink disable | CTRL D | |
| Blink enable | CTRL C | |
| Blink off | CTRL O | |
| Blink on | CTRL N | |
| Carriage return | CTRL M | CTRL M |
| Cursor down | CTRL Z | CSI ... B |
| Cursor home | CTRL H | |
| Cursor left | CTRL Y | CSI ... D or CTRL H |
| Cursor position | | CSI ... ; ... H |
| Cursor right | CTRL X | CSI ... C |
| Cursor up | CTRL W | CSI ... A |
| Device status report | | CSI 6n |
| Dim off | CTRL ] | |
| Dim on | CTRL \ | |
| Erase end-of-line | CTRL K | CSI ... K |
| Erase end-of-screen | <036>FF | CSI ... J |
| Erase screen | CTRL L | |
| Form feed | | CTRL L |
| Media copy * | | CSI ... i |
| New line | CTRL J | CTRL J |
| Primary character set enable * | <036>O | |
| Print screen * | CTRL Q | |
| Print screen form * | CTRL A | |
| Read model ID | <036>C | |
| Read cursor address | CTRL E | |
| Read terminal configuration | | CSI x |
| Reset mode | | CSI ... ; ... l |
| Reverse video off | <036>E or CTRL B | |
| Reverse video on | <036>D or CTRL V | |

## Command Codes—Alphabetic By Function

### Data General Command Codes *(Continued)*

| Function | ASCII Mode Command | ANSI Mode Command |
|---|---|---|
| **Roll disable** | CTRL S | |
| **Roll enable** | CTRL R | |
| **Secondary character set enable** * | <036>N | |
| **Select ANSI mode** | <036>F@ | |
| **Select character set** * | <036>FS ... | ESC ... or ESC ) ... or ESC * ... or ESC + ... |
| **Select 7/8-bit operation** * | <036>FU ... | |
| **Select graphics rendition** | | CSI ... ; ... m |
| **Set keyboard language** * | <036>Ff ... | |
| **Set mode** | | CSI ... ; ... h |
| **Set parameters** * | | CSI ... ; ... v |
| **Shift in** * | | CTRL O |
| **Shift out** * | | CTRL N |
| **Single shift two** * | | ESC N |
| **Single shift three** * | | ESC O |
| **Underscore off** | CTRL U | |
| **Underscore on** | CTRL T | |
| **Write cursor address** | CTRL P ... | |
| **XOFF** | | CTRL S |
| **XON** | | CTRL Q |

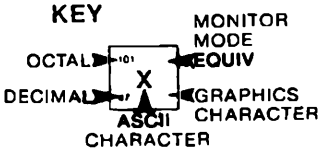
*NOTE: D211 Command only, D210 does not respond.
<036> is the octal value for the ASCII code which precedes two character command sequences.

# ASCII Character Set

# Appendix D

| HIGH NIBBLE | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| LOW NIBBLE | CONTROL | | NUMBERS SYMBOLS | | UPPER CASE | | LOWER CASE | |
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p |
| 1 | SOH | DC1 | ! | 1 | A | Q | a | q |
| 2 | STX | DC2 | " | 2 | B | R | b | r |
| 3 | ETX | DC3 | # | 3 | C | S | c | s |
| 4 | EOT | DC4 | $ | 4 | D | T | d | t |
| 5 | ENQ | NAK | % | 5 | E | U | e | u |
| 6 | ACK | SYN | & | 6 | F | V | f | v |
| 7 | BEL | ETB | ' | 7 | G | W | g | w |
| 8 | BS | CAN | ( | 8 | H | X | h | x |
| 9 | HT | EM | ) | 9 | I | Y | i | y |
| A | LF | SUB | * | : | J | Z | j | z |
| B | VT | ESC | + | ; | K | [ | k | { |
| C | FF | FS | , | < | L | \ | l | \| |
| D | CR | GS | - | = | M | ] | m | } |
| E | SO | RS | . | > | N | ^ | n | ~ |
| F | SI | US | / | ? | O | _ | o | RUBOUT (DEL) |

KEY




Note: The graphic symbols shown with x (i.e. $x^0$) are used to indicate a subscript or superscript. The letter x does not actually appear on the screen when these characters are used

# ANSI Character Set

7-BIT CODES

These are the codes which can be accessed in 7-bit mode or in 8-bit mode when bit 7 is clear.

| HIGH NIBBLE | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| LOW NIBBLE | CONTROL C0 | | | | | | | |
| 0 | 0 NUL 0 | 20 $D_L$ DLE 16 | 40 SP 32 | | | | | |
| 1 | 1 $S_H$ SOH 1 | 21 $D_1$ DC1 17 | | | | | | |
| 2 | 2 $S_X$ STX 2 | 22 $D_2$ DC2 18 | | | | | | |
| 3 | 3 $E_X$ ETX 3 | 23 $D_3$ DC3 19 | | | | | | |
| 4 | 4 $E_T$ EOT 4 | 24 $D_4$ DC4 20 | | | | | | |
| 5 | 5 $E_Q$ ENQ 5 | 25 $N_K$ NAK 21 | | | | | | |
| 6 | 6 $A_K$ ACK 6 | 26 $S_Y$ SYN 22 | | | | | | |
| 7 | 7 $B_L$ BEL 7 | 27 $E_B$ ETB 23 | | | | | | |
| 8 | 10 $B_S$ BS 8 | 30 $C_N$ CAN 24 | | | | | | |
| 9 | 11 $H_T$ HT 9 | 31 $E_M$ EM 25 | | | | | | |
| A | 12 $L_F$ LF 10 | 32 $S_B$ SUB 26 | | | | | | |
| B | 13 $V_T$ VT 11 | 33 $E_C$ ESC 27 | | | | | | |
| C | 14 $F_F$ FF 12 | 34 $F_S$ FS 28 | | | | | | |
| D | 15 $C_R$ CR 13 | 35 $G_S$ GS 29 | | | | | | |
| E | 16 $S_O$ SO 14 | 36 $R_S$ RS 30 | | | | | | |
| F | 17 $S_I$ SI 15 | 37 $U_S$ US 31 | | | | | | 177 RUBOUT (DEL) 127 $N_U$ |

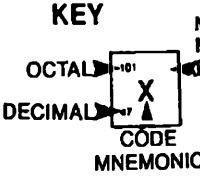
GL

The different character sets shown in the following pages of this Appendix E can be mapped into this section.

If characters are mapped into this left side table, they may be accessed via their character addresses alone.

When power is first applied or the terminal is reset, the ASCII character set is mapped into this side.

KEY



## 8-BIT CODES

These are the codes which can be accessed in 8-bit mode when bit 7 is set

Note: The Monitor mode representation of the C1 control codes will be their 7-bit equivalents.

| HIGH NIBBLE | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| LOW NIBBLE | CONTROL C1 | | | | | | | |
| 0 | 200 128 | 220 DCS 144 | 240 160 | | | | | |
| 1 | 201 129 | 221 PU1 145 | | | | | | |
| 2 | 202 130 | 222 PU2 146 | | | | | | |
| 3 | 203 131 | 223 STS 147 | | | | | | |
| 4 | 204 IND 132 | 224 CCH 148 | | | | | | |
| 5 | 205 NEL 133 | 225 MW 149 | | | | | | |
| 6 | 206 SSA 134 | 226 SPA 150 | | | | | | |
| 7 | 207 ESA 135 | 227 EPA 151 | | | | | | |
| 8 | 210 HTS 136 | 230 152 | | | | | | |
| 9 | 211 HTJ 137 | 231 153 | | | | | | |
| A | 212 VTS 138 | 232 154 | | | | | | |
| B | 213 PLD 139 | 233 CSI 155 | | | | | | |
| C | 214 PLU 140 | 234 ST 156 | | | | | | |
| D | 215 RI 141 | 235 OSC 157 | | | | | | |
| E | 216 SS2 142 | 236 PM 158 | | | | | | |
| F | 217 SS3 143 | 237 APC 159 | | | | | | 377 255 |

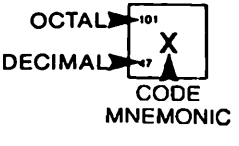
**GR**

The different character sets shown in the following pages of this Appendix E can be mapped into this section.

If characters are mapped into this right side table, they may be accessed via their character addresses plus an address offset of 128 decimal.

When power is first applied or the terminal is reset, the multinational character set is mapped into this side.

KEY



# ANSI Character Set *(Continued)*

## ASCII Character Set

Use the numbers shown in the table to access these characters when they are mapped into the left (GL) table. If this character set is mapped into the right table (GR), character addresses must be offset by adding 128 decimal, 200 octal, or 80 hexadecimal.

| HIGH NIBBLE | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| LOW NIBBLE | NUMBERS SYMBOLS | | UPPER CASE | | LOWER CASE | |
| 0 | | 0 | @ | P | ` | p |
| 1 | ! | 1 | A | Q | a | q |
| 2 | " | 2 | B | R | b | r |
| 3 | # | 3 | C | S | c | s |
| 4 | $ | 4 | D | T | d | t |
| 5 | % | 5 | E | U | e | u |
| 6 | & | 6 | F | V | f | v |
| 7 | ' | 7 | G | W | g | w |
| 8 | ( | 8 | H | X | h | x |
| 9 | ) | 9 | I | Y | i | y |
| A | * | : | J | Z | j | z |
| B | + | ; | K | [ | k | { |
| C | , | < | L | \ | l | \| |
| D | - | = | M | ] | m | } |
| E | . | > | N | ^ | n | ~ |
| F | / | ? | O | _ | o | |

**KEY**

# Appendix E

## U.K. Character Set

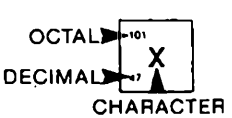
**(Only Available in VT100 and VT52 Emulation Modes)**

Use the numbers shown in the table to access these characters when they are mapped into the left (GL) table. If this character set is mapped into the right table (GR), character addresses must be offset by adding 128 decimal, 200 octal, or 80 hexadecimal.

The only difference between the U.K. and ASCII character sets is the character representing hexadecimal address 32. In ASCII this is shown as a hash mark (#); in the U.K. set this is shown as a pound sterling symbol (£).

| HIGH NIBBLE | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| LOW NIBBLE | NUMBERS SYMBOLS | | UPPER CASE | | LOWER CASE | |
| 0 | | 0 | @ | P | ` | p |
| 1 | ! | 1 | A | Q | a | q |
| 2 | " | 2 | B | R | b | r |
| 3 | £ | 3 | C | S | c | s |
| 4 | $ | 4 | D | T | d | t |
| 5 | % | 5 | E | U | e | u |
| 6 | & | 6 | F | V | f | v |
| 7 | ' | 7 | G | W | g | w |
| 8 | ( | 8 | H | X | h | x |
| 9 | ) | 9 | I | Y | i | y |
| A | * | : | J | Z | j | z |
| B | + | ; | K | [ | k | { |
| C | , | < | L | \ | l | \| |
| D | - | = | M | ] | m | } |
| E | . | > | N | ^ | n | ~ |
| F | / | ? | O | _ | o | |

**KEY**



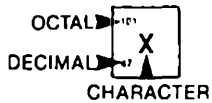
## Multinational Character Set

Use the numbers shown in the table to access these characters when they are mapped into the left (GL) table. If this character set is mapped into the right table (GR), character addresses must be offset by adding 128 decimal, 200 octal, or 80 hexadecimal.

**Note:** The graphic symbols shown with x (i.e., $x^n$) are used to indicate a subscript or superscript. The letter x does not actually appear on the screen when these characters are used.

If positions indicated by blank spaces are accessed, the transmission error character (Ş) will be shown.

**KEY**




| HIGH NIBBLE | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| LOW NIBBLE | SPECIAL SYMBOLS | | UPPER CASE | | LOWER CASE | |
| 0 | | 60 o 48 | 100 À 64 | 120 80 | 140 à 96 | 160 112 |
| 1 | 41 ¡ 33 | 61 ± 49 | 101 Á 65 | 121 Ñ 81 | 141 á 97 | 161 ñ 113 |
| 2 | 42 ¢ 34 | 62 $x^2$ 50 | 102 Â 66 | 122 Ò 82 | 142 â 98 | 162 ò 114 |
| 3 | 43 £ 35 | 63 $x^3$ 51 | 103 Ã 67 | 123 Ó 83 | 143 ã 99 | 163 ó 115 |
| 4 | 44 36 | 64 52 | 104 Ä 68 | 124 Ô 84 | 144 ä 100 | 164 ô 116 |
| 5 | 45 ¥ 37 | 65 µ 53 | 105 Å 69 | 125 Õ 85 | 145 à 101 | 165 õ 117 |
| 6 | 46 38 | 66 ¶ 54 | 106 Æ 70 | 126 Ö 86 | 146 æ 102 | 166 ö 118 |
| 7 | 47 § 39 | 67 • 55 | 107 Ç 71 | 127 Œ 87 | 147 ç 103 | 167 œ 119 |
| 8 | 50 ¤ 40 | 70 56 | 110 È 72 | 130 Ø 88 | 150 è 104 | 170 ø 120 |
| 9 | 51 © 41 | 71 $x^1$ 57 | 111 É 73 | 131 Ù 89 | 151 é 105 | 171 ù 121 |
| A | 52 a 42 | 72 º 58 | 112 Ê 74 | 132 Ú 90 | 152 ê 106 | 172 ú 122 |
| B | 53 « 43 | 73 » 59 | 113 Ë 75 | 133 Û 91 | 153 ë 107 | 173 û 123 |
| C | 54 44 | 74 ¼ 60 | 114 Ì 76 | 134 Ü 92 | 154 ì 108 | 174 ü 124 |
| D | 55 45 | 75 ½ 61 | 115 Í 77 | 135 Ý 93 | 155 í 109 | 175 ý 125 |
| E | 56 46 | 76 62 | 116 Î 78 | 136 94 | 156 î 110 | 176 126 |
| F | 57 47 | 77 ¿ 63 | 117 Ï 79 | 137 ß 95 | 157 ï 111 | |

# Appendix E

## Special Graphics Character Set

Use the numbers shown in the table to access these characters when they are mapped into the left (GL) table. If this character set is mapped into the right table (GR), character addresses must be offset by adding 128 decimal, 200 octal, or 80 hexadecimal.

| HIGH NIBBLE | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| LOW NIBBLE | NUMBERS SYMBOLS | | UPPER CASE | | GRAPHICS SYMBOLS | |
| 0 | | 0 | @ | P | ♦ | |
| 1 | ! | 1 | A | Q | # | |
| 2 | " | 2 | B | R | HT | |
| 3 | # | 3 | C | S | FF | |
| 4 | $ | 4 | D | T | CR | ├ |
| 5 | % | 5 | E | U | LF | ┤ |
| 6 | & | 6 | F | V | ° | ┴ |
| 7 | ' | 7 | G | W | ± | ┬ |
| 8 | ( | 8 | H | X | NL | │ |
| 9 | ) | 9 | I | Y | VT | ≤ |
| A | * | : | J | Z | ┘ | ≥ |
| B | + | ; | K | [ | ┐ | π |
| C | , | < | L | \ | ┌ | ≠ |
| D | - | = | M | ] | └ | £ |
| E | . | > | N | ^ | ┼ | · |
| F | / | ? | O | _ | | |

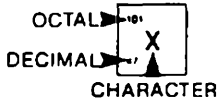
KEY

OCTAL → 101
DECIMAL → 65
X
CHARACTER

# PC Character Set

| DECIMAL VALUE ➡ | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 |
|---|---|---|---|---|---|---|---|---|
| ⬇ HEXA DECIMAL VALUE | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 0 0 | 20 ► 16 | 40 32 | 60 0 48 | 100 @ 64 | 120 P 80 | 140 · 96 | 160 p 112 |
| 1 | 1 | 1 ☺ 1 | 21 ◄ 17 | 41 ! 33 | 61 1 49 | 101 A 65 | 121 Q 81 | 141 a 97 | 161 q 113 |
| 2 | 2 | 2 ☻ 2 | 22 ↕ 18 | 42 " 34 | 62 2 50 | 102 B 66 | 122 R 82 | 142 b 98 | 162 r 114 |
| 3 | 3 | 3 ♥ 3 | 23 !! 19 | 43 # 35 | 63 3 51 | 103 C 67 | 123 S 83 | 143 c 99 | 163 s 115 |
| 4 | 4 | 4 ♦ 4 | 24 ¶ 20 | 44 $ 36 | 64 4 52 | 104 D 68 | 124 T 84 | 144 d 100 | 164 t 116 |
| 5 | 5 | 5 ♣ 5 | 25 § 21 | 45 % 37 | 65 5 53 | 105 E 69 | 125 U 85 | 145 e 101 | 165 u 117 |
| 6 | 6 | 6 ♠ 6 | 26 ▬ 22 | 46 & 38 | 66 6 54 | 106 F 70 | 126 V 86 | 146 f 102 | 166 v 118 |
| 7 | 7 | 7 • 7 | 27 ↨ 23 | 47 ' 39 | 67 7 55 | 107 G 71 | 127 W 87 | 147 g 103 | 167 w 119 |
| 8 | 8 | 10 ◘ 8 | 30 ↑ 24 | 50 ( 40 | 70 8 56 | 110 H 72 | 130 X 88 | 150 h 104 | 170 x 120 |
| 9 | 9 | 11 ○ 9 | 31 ↓ 25 | 51 ) 41 | 71 9 57 | 111 I 73 | 131 Y 89 | 151 i 105 | 171 y 121 |
| 10 | A | 12 ◙ 10 | 32 → 26 | 52 * 42 | 72 : 58 | 112 J 74 | 132 Z 90 | 152 j 106 | 172 z 122 |
| 11 | B | 13 ♂ 11 | 33 ← 27 | 53 + 43 | 73 ; 59 | 113 K 75 | 133 [ 91 | 153 k 107 | 173 { 123 |
| 12 | C | 14 ♀ 12 | 34 └ 28 | 54 , 44 | 74 < 60 | 114 L 76 | 134 \ 92 | 154 l 108 | 174 \| 124 |
| 13 | D | 15 ♪ 13 | 35 ↔ 29 | 55 - 45 | 75 = 61 | 115 M 77 | 135 ] 93 | 155 m 109 | 175 } 125 |
| 14 | E | 16 ♫ 14 | 36 ▲ 30 | 56 . 46 | 76 > 62 | 116 N 78 | 136 ^ 94 | 156 n 110 | 176 ~ 126 |
| 15 | F | 17 ☼ 15 | 37 ▼ 31 | 57 / 47 | 77 ? 63 | 117 O 79 | 137 _ 95 | 157 o 111 | 177 ⌂ 127 |

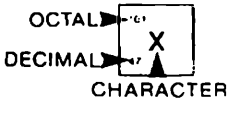
KEY



# Appendix F

| DECIMAL VALUE ➡ | | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 |
|---|---|---|---|---|---|---|---|---|---|
| ⬇ | HEXA DECIMAL VALUE | 8 | 9 | A | B | C | D | E | F |
| 0 | 0 | 200 Ç 128 | 220 É 144 | 240 á 160 | 260 ▒ 176 | 300 ┐ 192 | 320 ╨ 208 | 340 α 224 | 360 ■ 240 |
| 1 | 1 | 201 ü 129 | 221 æ 145 | 241 í 161 | 261 ▓ 177 | 301 └ 193 | 321 ╤ 209 | 341 β 225 | 361 ± 241 |
| 2 | 2 | 202 é 130 | 222 Æ 146 | 242 ó 162 | 262 │ 178 | 302 ┴ 194 | 322 ╥ 210 | 342 Γ 226 | 362 ≥ 242 |
| 3 | 3 | 203 â 131 | 223 ô 147 | 243 ú 163 | 263 ┤ 179 | 303 ├ 195 | 323 ╙ 211 | 343 π 227 | 363 ≤ 243 |
| 4 | 4 | 204 ä 132 | 224 ö 148 | 244 ñ 164 | 264 ╡ 180 | 304 ─ 196 | 324 ╘ 212 | 344 Σ 228 | 364 ⌠ 244 |
| 5 | 5 | 205 à 133 | 225 ò 149 | 245 Ñ 165 | 265 ╢ 181 | 305 ┼ 197 | 325 ╒ 213 | 345 σ 229 | 365 ⌡ 245 |
| 6 | 6 | 206 å 134 | 226 û 150 | 246 ª 166 | 266 ╖ 182 | 306 ╞ 198 | 326 ╓ 214 | 346 µ 230 | 366 ÷ 246 |
| 7 | 7 | 207 ç 135 | 227 ù 151 | 247 º 167 | 267 ╕ 183 | 307 ╟ 199 | 327 ╫ 215 | 347 τ 231 | 367 ≈ 247 |
| 8 | 8 | 210 ê 136 | 230 ÿ 152 | 250 ¿ 168 | 270 ╣ 184 | 310 ╚ 200 | 330 ╪ 216 | 350 Φ 232 | 370 ° 248 |
| 9 | 9 | 211 ë 137 | 231 Ö 153 | 251 ⌐ 169 | 271 ╗ 185 | 311 ╔ 201 | 331 ┘ 217 | 351 θ 233 | 371 ∙ 249 |
| 10 | A | 212 è 138 | 232 Ü 154 | 252 ¬ 170 | 272 ╝ 186 | 312 ╩ 202 | 332 ┌ 218 | 352 Ω 234 | 372 · 250 |
| 11 | B | 213 ï 139 | 233 ¢ 155 | 253 ½ 171 | 273 ╜ 187 | 313 ╦ 203 | 333 ▌ 219 | 353 δ 235 | 373 √ 251 |
| 12 | C | 214 î 140 | 234 £ 156 | 254 ¼ 172 | 274 ╛ 188 | 314 ╠ 204 | 334 ▄ 220 | 354 ∞ 236 | 374 n 252 |
| 13 | D | 215 ì 141 | 235 ¥ 157 | 255 ¡ 173 | 275 ╞ 189 | 315 ═ 205 | 335 ▐ 221 | 355 φ 237 | 375 2 253 |
| 14 | E | 216 Ä 142 | 236 ₧ 158 | 256 « 174 | 276 ╟ 190 | 316 ╬ 206 | 336 ▀ 222 | 356 ∈ 238 | 376 ■ 254 |
| 15 | F | 217 Å 143 | 237 ƒ 159 | 257 » 175 | 277 ╚ 191 | 317 ╧ 207 | 337 ▀ 223 | 357 ∩ 239 | 377 BLANK 'FF' 255 |

KEY



# Connector Pin Assignments

# Appendix G

**Configuration — Data Terminal Equipment (Main Port)**
**Connector Type — DB25 Female**

| Pin No. | I/O | Function | Pin No. | I/O | Function |
|---|---|---|---|---|---|
| 1 | X | Chassis Ground | 14 | X | N.C. |
| 2 | O | Data From Terminal to Computer (TxD) | 15 | X | N.C. |
| 3 | I | Data From Computer (RxD) | 16 | X | N.C. |
| 4 | O | Request to Send (RTS) | 17 | X | N.C. |
| 5 | I | Clear to Send (CTS) | 18 | X | N.C. |
| 6 | I | Data Set Ready (DSR) | 19 | X | N.C. |
| 7 | X | Signal Ground | 20 | O | Data Terminal Ready (DTR) |
| 8 | I | Data Carrier Detect (DCD) | 21 | X | N.C. |
| 9 | X | N.C. | 22 | X | N.C. |
| 10 | X | N.C. | 23 | X | N.C. |
| 11 | X | N.C. | 24 | X | N.C. |
| 12 | X | N.C. | 25 | X | N.C. |
| 13 | X | N.C. | | | |

**Note:** The auxiliary port is a Data Communication Equipment (DCE) interface. The same connector and pin assignments are used. Only the directions of the signals are reversed.

# ASCII Set-Up Parameters

# Appendix H

## Main Port Set-Up

| Parameter | Setting Options | Description |
|---|---|---|
| **Mode** | Full Duplex (default) | Data is sent to host and echoed back before being displayed |
| | Half Duplex | Data is displayed at same time as sent to host |
| | Local Duplex | Terminal does not send or receive from host |
| | Block Send | Data is sent only when send function issued |
| **Speed** | 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600 (default), 19200, 38400 | Communications speed, bits per second |
| **Parity** | None (Default) | The terminal does not check parity |
| | Odd | The terminal sends/receives characters with odd parity |
| | Even | The terminal sends/receives characters with even parity |
| | Mark | The terminal sends/receives characters with mark parity |
| | Space | The terminal sends/receives characters with space parity |
| **Data Bits** | 7 | The main port sends and receives 7-bit characters |
| | 8 (default) | The main port sends and receives 8-bit characters |
| **Stop Bits** | 1 (default) | One stop bit is sent after every character |
| | 2 | Two stop bits are sent after every character |
| **Signal At** | 64 (default) | Terminal sends XOFF or DTR handshake signal when buffer is 64 characters from full |
| | 128 | Terminal sends XOFF or DTR handshake signal when buffer is 128 characters from full |

# ASCII Set-Up Parameters

## Main Port Set-Up *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **DTR** | On | Hardware handshaking (DTR) is on |
| | Off (default) | Hardware handshaking (DTR) is off |
| **XON/XOFF** | On (default) | Software handshaking (XON/XOFF) is on |
| | Off | Software handshaking (XON/XOFF) is off |
| **XOFF =** | $D_3$ (default)<br>(User Defined) | Lets user define XOFF character |
| **XON =** | $D_1$ (default)<br>(User Defined) | Lets user define XON character |
| **ACK =** | $A_K$ (default)<br>(User Defined) | Lets user define printer acknowledge character |

# Appendix H

## Auxiliary Port Settings

| Parameter | Setting Options | Description |
|---|---|---|
| **Mode** | Off (default) | Disables AUX port |
| | Copy | Prints all data on screen to AUX device |
| | Transparent | Prints directly from host to AUX device |
| | Bidirection | MAIN and AUX ports communicates directly |
| **Speed** | 50, 75, 110, 134.5, 150, 300, 600, 1200 (default), 1800, 2400, 3600, 4800, 7200, 9600, 19200 | Communications speed, bits per second |
| **Parity** | None (default) | The terminal does not check for parity. |
| | Odd | The terminal sends characters with odd parity |
| | Even | The terminal sends characters with even parity |
| **Data Bits** | 7 | The AUX port sends and receives 7-bit characters |
| | 8 (default) | The AUX port sends and receives 8-bit characters |
| **Stop Bits** | 1 (default) | One stop bit is sent after every character |
| | 2 | Two stop bits are sent after every character |
| **DTR** | On (default) | Hardware handshaking (DTR) is on |
| | Off | Hardware handshaking (DTR) is off |
| **XON/XOFF** | On (default) | Software handshaking (XON/XOFF) is on |
| | Off | Software handshaking (XON/XOFF) is off |
| **Buffer Size** | 256 (default) | The main and auxiliary port buffers are 256 characters |
| | 3K | The main and auxiliary port buffers are 3072 characters |

# ASCII Set-Up Parameters *(Continued)*

## Block Send Settings

| Parameter | Setting Options | Description |
|---|---|---|
| **Field Mark =** | <ESC><NUL> | Write protect field indicator |
| **Line Mark =** | <ESC><NUL> | End of line indicator |
| **Start Protect =** | <ESC><)> | End of protected field indicator |
| **End Protect =** | <ESC><(> | End of protected field indicator |
| **End of Message =** | <CR><NUL> | End of transmission indicator |
| **Handshake** | None (default) | No handshaking |
| | Xon/Xoff | Enables Xon/Xoff handshaking |
| | Limited | Limits transmission to 1200 baud |
| | Both | Enables Xon/Xoff and limited transmission |

The above setting options are factory default settings. All parameters except HANDSHAKE are fully user selectable.

# Appendix H

## Display Settings

| Parameter | Setting Options | Description |
|---|---|---|
| Lines/Page | 24 (default) | Sets page boundary at 24th line |
| | 48 | Sets page boundary at 48th line |
| | 96 | Sets page boundary at 96th line |
| Columns | 80 (default) | Selects 80-column display format |
| | 132 | Selects 132-column display format |
| Auto Panning* | On (default) | 132-column memory, 80-column display—display follows cursor |
| | Off | 132-column memory, 80-column display—display doesn't follow cursor |
| Status Line | On (default) | Displays user/status line |
| | Off | Does not display user/status line |
| Background | Dark (default) | Light characters on dark background |
| Scroll Type | Jump (default) | Display scrolls a row of characters at a time |
| | Smooth 1 | Smooth scroll at 5 lines per second |
| | Smooth 2 | Smooth scroll at 10 lines per second |
| | Smooth 3 | Smooth scroll at 15 lines per second |
| | Smooth 4 | Smooth scroll at 20 lines per second |

*Note This parameter is only operational when 132-column display format has been selected and you have "zoomed" into an 80-column display format. To zoom into 80-column display press Ctrl, Shift, and Home simultaneously. To return to 132-column display press Ctrl, Shift, and Home again.

# ASCII Set-Up Parameters *(Continued)*

## Display Settings *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **Cursor Type** | Block (Default) | Cursor appears as a solid block |
| | BlnkLin | Cursor appears as a blinking line |
| | Line | Cursor appears as a line |
| | Blank | Cursor is not displayed |
| | BlnkBlk | Cursor appears as a blinking block |
| **Line Truncate** | Off (default) | At end of line cursor moves to next line |
| | On | At end of line cursor sits at end of line |
| **Auto New Line** | Off (default) | Upon receiving a carriage return, a line feed is not generated |
| | On | Upon receiving a carriage return, a line feed is automatically generated |
| **Auto Scroll** | On (default) | Reverse line feed at top inserts new line and scrolls screen down—bottom line lost. Line feed at bottom inserts new line and scrolls screen up—top line lost. |
| | Off | Reverse line feed at top positions cursor at bottom. Line feed at bottom positions cursor at top. |
| **Auto Page** | Off (default) | Reverse line feed and line feed controlled by auto scroll |
| | On | Reverse line feed at top puts cursor to previous page. Line feed at bottom puts cursor to next page. |
| **Protect** | Dim (default) | Defines protect attribute as dim intensity |
| | Normal | Defines protect attribute as normal intensity |
| | Reverse | Defines protect attribute as reverse video |
| **Insert Char =** | (User Defined) | Allows user to define insert character for use in insert mode and screen clears. |

# Appendix H

## Keyboard Settings

| Parameter | Setting Options | Description |
|---|---|---|
| Layout | North American (default), United Kingdom, Swiss, Swedish, Spanish, Norwegian, German, French, Danish, Canadian French | Selects keyboard layout for various languages supported |
| Click | Off (default) | Key depressions are silent |
| | On | Key depressions give audible feed back |
| Bell Tone | On (default) | Allows bell tone on <CTRL G> |
| | Off | Disables bell tone |
| Margin Bell | Off (default) | Bell silent on margin tab |
| | On (1...132) | Bell rings on selected margin tab |
| Auto Repeat | 8, 12, 16, 20 24 (default), 28, 32, 50 | Number of times per second keys repeat when held down |
| Delay | .25, .5 (default), .6, .8, 1.0, 1.2, 1.4, 1.6, infinite | Time between when key depressed and when it begins repeating (seconds) |
| Lock Type | CAPS (default) | When Lock key depressed makes all alphabetic characters upper-case |
| | SHIFT | When Lock key depressed selects shifted key value on all keys |
| Lock Set | Off (default) | Lock is not selected on power up |
| | On | Lock is selected on power up |

# ASCII Set-Up Parameters *(Continued)*

## Keyboard Setting *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **Wordstar Mode** | Off (default) | Disables WordStar command codes |
| | On | Loads WordStar command codes into functional and cursor control keys |
| **Edit Duplex** | Remote (default) | Edit keys transmit to host |
| | Local | Edit keys processed locally by terminal |
| **Edit Mode** | Edit Line (default) | Character replacement as entered, insert/delete character only affects to end of line |
| | Edit Page | Character replacement as entered, insert/delete character affects to end of page |
| | Insert Line | Character inserted as entered, insert/delete character to end of line |
| | Insert Page | Character inserted as entered, inserted/delete character to end of page |

# Appendix H

## Screen Saver And Emulation Settings

| Parameter | Setting Options | Description |
|---|---|---|
| Screen Saver | Off | Display always on |
| | 5 | Display turns off after 5 minutes of inactivity |
| | 10 | Display turns off after 10 minutes of inactivity |
| | 15 (default) | Display turns off after 15 minutes of inactivity |
| Emulation | Freedom ONE (default) | Selects Freedom ONE native mode |
| | TeleVideo 950 | Selects TeleVideo 950 emulation mode |
| | TeleVideo 925 | Selects TeleVideo 925 emulation mode |
| | LSI ADM 31 | Selects LSI ADM 31 emulation mode |
| | WYSE 50 | Selects WYSE 50 emulation mode |
| | Viewpoint A2 Enhance Off | Selects Viewpoint A2 emulation mode |
| | Viewpoint A2 Enhance On | Selects Viewpoint A2 with enhanced WY-50 commands |
| | PC Terminal | Selects PC Terminal emulation mode (Freedom ONE Plus only) |

# ANSI Set-Up Parameters

## Main Port Set-Up

| Parameter | Setting Options | Description |
|---|---|---|
| **Mode** | Remote (Default) | Allows transmission to computer |
| | Local | Limits communication within terminal |
| **Local Echo** | Off (Default) | Screen does not echo keys pressed on keyboard |
| | On | Screen echos keys pressed on keyboard |
| **Receive Speed** | 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600 (default), 19200, 38400 | Communications speed, bits per second |
| **Transmit Speed** | 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600, 19200, 38400, Receiver (Default) | Allows for separate receive and transmit speeds on the MAIN port, bits per second |
| **Parity** | None (Default) | The terminal does not check parity |
| | Odd | The terminal sends/receives characters with odd parity |
| | Even | The terminal sends/receives characters with even parity |
| | Mark | The terminal sends/receives characters with mark parity |
| | Space | The terminal sends/receives characters with space parity |
| | Odd-No Check | The terminal sends/receives characters with odd parity—no checking |
| | Even-No Check | The terminal sends/receives characters with even parity—no checking |

## Main Port Set-Up *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **Data Bits** | 7 | The main port sends and receives 7-bit characters |
| | 8 (default) | The main port sends and receives 8-bit characters |
| **Stop Bits** | 1 (default) | One stop bit is sent after every character |
| | 2 | Two stop bits are sent after every character |
| **Signal At** | 64 (default) | Terminal sends XOFF or DTR handshake signal when buffer is 64 characters from full |
| | 128 | Terminal sends XOFF or DTR handshake signal when buffer is 128 characters from full |
| **Receive Protocol** | None | No handshaking |
| | Xon/Xoff (Default) | Selects Xon/Xoff handshaking |
| | DTR | Selects DTR handshaking |
| | Both | Selects both Xon/Xoff and DTR handshaking |
| **Transmit Protocol** | None (Default) | No handshaking |
| | Xon/Xoff | Enables Xon/Xoff handshaking |
| | Limited | Limits transmission to 1200 baud |
| | Both | Enables Xon/Xoff and limited transmission |
| XOFF = | $D_1$ (default)<br>(User Defined) | Lets user define XON character |
| XON = | $D_1$ (default)<br>(User Defined) | Lets user define ACK printer acknowledge character |

# ANSI Set-Up Parameters *(Continued)*

## Auxiliary Port Settings

| Parameter | Setting Options | Description |
|---|---|---|
| **Mode** | Off (Default) | Enables print functions to be controlled from keyboard. |
| | Auto | Each line printed when line feed, form feed or vertical tab is received from the computer. |
| | Controller | All data from computer bypasses screen and is sent directly to AUX port |
| | Bidirection | Connects MAIN and AUX ports directly |
| **Speed** | 50, 75, 110, 134.5, 150, 300, 600, 1200 (default), 1800, 2400, 3600, 4800, 7200, 9600, 19200 | Communications speed, bits per second |
| **Parity** | None (Default) | The terminal does not check parity |
| | Odd | The terminal sends/receives characters with odd parity |
| | Even | The terminal sends/receives characters with even parity |
| | Mark - 7-bit only | The terminal sends/receives characters with mark parity |
| | Space - 7-bit only | The terminal sends/receives characters with space parity |
| | Odd - No Check | The terminal sends/receives characters with odd parity, no checking |
| | Even - No Check | The terminal sends/receives characters with even parity, no checking |

## Auxiliary Port Settings *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **Data Bits** | 7 | The AUX port sends and receives 7-bit characters |
| | 8 (default) | The AUX port sends and receives 8-bit characters |
| **Stop Bits** | 1 (default) | One stop bit is sent after every character |
| | 2 | Two stop bits are sent after every character |
| **Protocol** | None | No handshaking |
| | Xon/Xoff | Selects both Xon/Xoff handshaking. |
| | DTR | Selects DTR handshaking. |
| | Both (Default) | Selects both Xon/Xoff and DTR handshaking. |
| **Terminator** | None (Default) | No print terminator. |
| | <ff> | Selects form feed as print terminator. |
| **Print** | Full Screen (Default) | Entire screen is printed when Print key is pressed |
| | Scroll Region | Only scrolling region is printed when Print key is pressed |
| **Print Data** | All | For printers supporting multinational characters |
| | ASCII/U.K. (Default) | For printers supporting only ASCII/U.K. characters |
| | Line Draw | For printers supporting additional line drawing characters |
| **Buffer Size** | 256 (default) | The main and auxiliary port buffers are 256 characters |
| | 3K | The main and auxiliary port buffers are 3072 characters |

# ANSI Set-Up Parameters *(Continued)*

## Display Settings

| Parameter | Setting Options | Description |
|---|---|---|
| **Lines/Page** | 24 | Sets page boundary at 24th line |
| **Columns** | 80 (default) | Selects 80-column display format |
| | 132 | Selects 132-column display format |
| **Auto Panning*** | On (default) | 132-column memory, 80-column display—display follows cursor |
| | Off | 132-column memory, 80-column display—display doesn't follow cursor |
| **Status Line** | On (default) | Displays user/status line |
| | Off | Does not display user/status line |
| **Background** | Dark (default) | Light characters on dark background |
| | Light | Dark characters on light background |
| **Ctrl Codes** | Interpret (Default) | Terminal interprets and acts on Ctrl codes. |
| | Display | Terminal displays Ctrl codes. |
| **Scroll Type** | Jump (default) | Display scrolls a row of characters at a time |
| | Smooth 1 | Smooth scroll at 5 lines per second |
| | Smooth 2 | Smooth scroll at 10 lines per second |
| | Smooth 3 | Smooth scroll at 15 lines per second |
| | Smooth 4 | Smooth scroll at 20 lines per second |

***Note** This parameter is only operational when 132-column display format has been selected and you have "zoomed" into an 80-column display format. To zoom into 80-column display press Ctrl, Shift, and Home simultaneously. To return to 132-column display press Ctrl, Shift, and Home again.

## Display Settings *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| Cursor Display | Off | Cursor not displayed. |
| | On (Default) | Cursor displayed. |
| Cursor Type | Block (Default) | Cursor appears as a solid block |
| | BlnkLin | Cursor appears as a blinking line |
| | Line | Cursor appears as a line |
| | Blank | Cursor appears as a blank space |
| | BlnkBlk | Cursor appears as a blinking block |
| Line Truncate | Off (default) | At end of line cursor moves to next line |
| | On | At end of line cursor sits at end of line |
| Auto New Line | Off (default) | Upon receiving a carriage return, a line feed is not generated |
| | On | Upon receiving a carriage return, a line feed is automatically generated |
| Auto Scroll | On (default) | Reverse line feed at top inserts new line and scrolls screen down—bottom line lost. Line feed at bottom inserts new line and scrolls screen up—top line lost. |
| | Off | Reverse line feed at top positions cursor at bottom. Line feed at bottom positions cursor at top. |
| Insert Char = | (User Defined) | Allows user to define insert character for use in insert mode and screen clears. |

# ANSI Set-Up Parameters *(Continued)*

## Answerback Settings

| Parameter | Setting Options | Description |
|---|---|---|
| **Answerback** | | Allows programming of answerback message via the status line |
| **Concealed** | Off | Displays answerback message |
| | On (default) | Conceals answerback message |
| **Select** | Off | Answerback Disabled |
| | On (Default) | Answerback Enabled |

## Keyboard Settings

Please also refer to the DEC VT220 Style Keyboard User's Guide accompanying your keyboard

| Parameter | Setting Options | Description |
|---|---|---|
| **Layout** | North American (Default)<br>United Kingdom<br>Swiss (German)<br>Swiss (French)<br>Swedish<br>Spanish<br>Norwegian<br>Italian<br>German<br>French/Belgian<br>Flemish<br>Finnish<br>Dutch<br>Danish<br>Canadian French | Allows choice of 15 international keyboard layouts |

## Keyboard Settings *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **Type** | Typewriter (Default) | Selects standard typewriter layout |
| | Data Entry | Selects data entry keyboard layout |
| **Click** | Off (default) | Key depressions are silent |
| | On | Key depressions give audible feed back |
| **Bell Tone** | On (default) | Allows bell tone on <CTRL G> |
| | Off | Disables bell tone |
| **Margin Bell** | Off (default) | Bell silent on margin tab |
| | On (1...132) | Bell rings on selected margin tab |
| **Auto Repeat** | 8, 12, 16, 20 24 (default), 28, 32, 50 | Number of times per second keys repeat when held down |
| **Delay** | .25, .5 (default), .6, .8, 1.0, 1.2, 1.4, 1.6, infinite | Time between when key depressed and when it begins repeating (seconds) |
| **Lock Type** | CAPS (default) | When Lock key depressed makes all alphabetic characters upper-case |
| | SHIFT | When Lock key depressed selects shifted key value on all keys |
| **Lock Set** | Off (default) | Lock is not selected on power up |
| | On | Lock is selected on power up |

*(Continued)*

# ANSI Set-Up Parameters *(Continued)*

## Keyboard Settings *(Continued)*

| Parameter | Setting Options | Description |
|---|---|---|
| **User Features** | Unlocked (Default) | Terminal accepts user controllable features such as Keyboard Lock/Unlock, Smooth/Jump Scroll, Reverse/Normal Screen, Key Auto Repeat, Set/Clear Tabs |
| | Locked | Terminal ignores user selections on above features |
| **User Keys** | Unlocked (Default) | All programmable keys may be reprogrammed |
| | Locked | Programmable keys may not be reprogrammed |
| **Keypad Keys** | Normal (Default) | Selects labelled numeric key functions |
| | Application | Selects application key codes to be transmitted |
| **Cursor Keys** | Normal (Default) | Selects labelled cursor key function |
| | Application | Selects special application code to be transmitted |
| **Compose Key** | Off | Disables Compose key |
| | On (Default) | Allows Compose key to function |

## Miscellaneous

| Parameter | Setting Options | Description |
|---|---|---|
| **Screen Saver** | Off | Display always on |
| | 5 | Display turns off after 5 minutes of inactivity |
| | 10 | Display turns off after 10 minutes of inactivity |
| | 15 (default) | Display turns off after 15 minutes of inactivity |

# Appendix I

## Emulation Settings—Freedom ONE Plus (ANSI) Only

| Parameter | Setting Options | Description |
|---|---|---|
| Type | DEC VT200 (7-bit) | Selects VT200, 7-bit operation |
| | DEC VT200 (8-bit) | Selects VT200, 8-bit operation |
| | DEC VT100 (ASCII) | Selects VT100, ASCII operation |
| | DEC VT100 (U.K.) | Selects VT100, U.K. operation |
| | DEC VT52 (ASCII) | Selects VT52, ASCII operation |
| | DEC VT52 (U.K.) | Selects VT52, U.K. operation |
| | DASHER D210 | Selects D210 operation |
| | DASHER D211 (7-bit) | Selects D211, 7-bit operation |
| | DASHER D211 (8-bit) | Selects D211, 8-bit operation |
| Enhance | Off (Default) | Extra keys cannot be programmed |
| | On | Extra keys can be programmed |
| Mode | MODE DG | Selects native mode of the DASHER terminal selected |
| | MODE ANSI | Selects ANSI X3.64 mode of the DASHER terminal selected |

# ASCII Status Line Set-Up

## Appendix J

| | | | | | | |
|---|---|---|---|---|---|---|
| MAIN 1 | MODE | SPEED | PARITY | DATA BITS | STOP BITS | |
| MAIN 2 | SIGNAL AT | DTR | XON/XOFF | XOFF = | XON = | ACK = |
| AUXILIARY 1 | MODE | SPEED | PARITY | DATA BITS | STOP BITS | |
| AUXILIARY 2 | DTR | XON/XOFF | BUFFER SIZE | | | |
| BLOCK 1 | FIELD MARK = | LINE MARK = | START PROTECT = | END PROTECT = | | |
| BLOCK 2 | END OF MESSAGE = | HANDSHAKE | | | | |
| DISPLAY 1 | LINES/PAGE | COLUMNS | AUTO PANNING | STATUS LINE | | |
| DISPLAY 2 | BACKGROUND | SCROLL TYPE | CURSOR TYPE | | | |
| DISPLAY 3 | LINE TRUNCATE | AUTO NEW LINE | AUTO SCROLL | AUTO PAGE | | |
| DISPLAY 4 | PROTECT | INSERT CHAR = | | | | |
| KEYBOARD 1 | LAYOUT | CLICK | BELL TONE | MARGIN | | |
| KEYBOARD 2 | REPEAT RATE | DELAY | LOCK TYPE | LOCK SET | | |
| KEYBOARD 3 | WORDSTAR MODE | EDIT DUPLEX | EDIT MODE | | | |
| MISC | SCREEN SAVER | EMULATION | | | | |

To enter status line Set-Up mode, press the Set Up key. The status line then shows the Set-Up parameters. The parameter to be changed is shown in reverse video (assuming dark background). To move into the next area use the (←) and (→) keys. Parameter values can be changed by using the SPACE bar. Except for parameters which must be entered as a character, the possible values of the parameter are stepped through.

To move to the next status line use the (↑) or (↓) keys. To save parameters in non-volatile memory press Ctrl and Set Up simultaneously.

To restore parameters to the settings they contained when the terminal left the factory press Ctrl, Shift and Set Up simultaneously.

To exit status line Set-Up mode press Set Up.

# ANSI Status Line Set-Up

# Appendix K

| | | | | |
|---|---|---|---|---|
| MAIN 1 | MODE | LOCAL ECHO | RECEIVE SPEED | TRANSMIT SPEED |
| MAIN 2 | PARITY | DATA BITS | STOP BITS | SIGNAL AT |
| MAIN 3 | RECEIVE PROTOCOL | TRANSMIT PROTOCOL | XOFF = | XON = |
| AUXILIARY 1 | MODE | SPEED | PARITY | |
| AUXILIARY 2 | DATA BITS | STOP BITS | PROTOCOL | TERMINATOR |
| AUXILIARY 3 | PRINT | PRINT DATA | BUFFER SIZE | |
| DISPLAY 1 | LINES/PAGE | COLUMNS | AUTO PANNING | STATUS LINE |
| DISPLAY 2 | BACKGROUND | CTRL CODES | SCROLL TYPE | |
| DISPLAY 3 | CURSOR DISPLAY | CURSOR TYPE | LINE TRUNCATE | |
| DISPLAY 4 | AUTO NEW LINE | AUTO SCROLL | INSERT CHAR = | SCREEN SAVER |
| ANSWERBACK | MESSAGE | CONCEALED | SELECT | |
| KEYBOARD 1 | LAYOUT | TYPE | CLICK | BELL TONE |
| KEYBOARD 2 | MARGIN | REPEAT RATE | DELAY | LOCK TYPE | LOCK SET |
| KEYBOARD 3 | USER FEATURES | USER KEYS | | |
| KEYBOARD 4 | KEYPAD KEYS | CURSOR KEYS | COMPOSE KEY | |
| EMULATION | TYPE | MODE | | |

As in full screen Set-Up mode the parameters to choose from vary depending on which type of emulation, ASCII or ANSI, is selected. Appendices H and I describe the parameter setting options for the ASCII Set-Up and the ANSI Set-Up respectively.

# PRODUCT ENHANCEMENT 008701

## PASSWORD SECURITY SYSTEM FOR THE FREEDOM ONE ANSI

The capability of specifying a password has been added to the Freedom ONE series of terminals. If a password has been assigned, changes to the setup parameter values cannot be saved into the non-volatile memory while in the single line setup menu. A bell tone is generated each time a save "Ctrl SetUp" or a restore to default "Ctrl-Shift SetUp" is entered. Changes can only be saved while in the full screen setup menu. When a save or a restore to default is desired, the prompt:

**Password:**

Appears on the bottom right-hand corner of the screen. Up to 6 characters can be entered. A match with the stored password causes the desired action to be executed. A mismatch generates a bell tone and displays the message:

**Bad Password:**

Once the sixth character is entered, the terminal compares it to the stored password. If less than 6 characters are entered, a carriage return follows the last character. Other than a carriage return, any key combination can be used as the password.

The password is initially not set and can be reset if there is an error in the non-volatile memory. Setting or changing the password can only occur while in the full screen setup. To set or change the password, the setup information must first be saved — "Ctrl SetUp". Then, a "Ctrl P" immediately follows to generate the prompt:

**New Password:**

Up to 6 characters can be entered. If less than 6 characters are entered, a carriage return follows the last character. As indicated earlier, any key combination other than a carriage return can be used as the password. Once the sixth character or a carriage return is detected, the terminal then saves the password if one does not already exist. Attempting to save a stored password generates the prompt:

**Old Password:**

Again, the same rule follows for password entry. If the old password entered matches the one currently saved, the password then becomes the new password entered. A mismatch generates a bell tone and displays the message:

**Bad Password:**

To delete the password capability, a carriage return is entered in response to the prompt:

**New Password:**

If the password is forgotten, it can be erased by removing the battery and waiting for the information in the non-volatile memory to be lost.

The operation of the terminal is unaffected if the password system is not utilized.

# PRODUCT ENHANCEMENT 008701

## PASSWORD SECURITY SYSTEM FOR THE FREEDOM ONE, FREEDOM ONE PLUS AND THE FREEDOM ONE TURBO

The capability of specifying a password has been added to the Freedom ONE series of terminals. If a password has been assigned, changes to the setup parameter values cannot be saved into the non-volatile memory while in the single line setup menu. A bell tone is generated each time a save "Ctrl SetUp" or a restore to default "Ctrl-Shift SetUp" is entered. Changes can only be saved while in the full screen setup menu. When a save or a restore to default is desired, the prompt:

**Password:**

Appears on the bottom right-hand corner of the screen. Up to 6 characters can be entered. A match with the stored password causes the desired action to be executed. A mismatch generates a bell tone and displays the message:

**Bad Password:**

Once the sixth character is entered, the terminal compares it to the stored password. If less than 6 characters are entered, a carriage return follows the last character. Other than a carriage return, any key combination can be used as the password.

The password is initially not set and can be reset if there is an error in the non-volatile memory. Setting or changing the password can only occur while in the full screen setup. To set or change the password, the setup information must first be saved — "Ctrl SetUp". Then, a "Ctrl P" immediately follows to generate the prompt:

**New Password:**

Up to 6 characters can be entered. If less than 6 characters are entered, a carriage return follows the last character. As indicated earlier, any key combination other than a carriage return can be used as the password. Once the sixth character or a carriage return is detected, the terminal then saves the password if one does not already exist. Attempting to save a stored password generates the prompt:

**Old Password:**

Again, the same rule follows for password entry. If the old password entered matches the one currently saved, the password then becomes the new password entered. A mismatch generates a bell tone and displays the message:

**Bad Password:**

To delete the password capability, a carriage return is entered in response to the prompt:

**New Password:**

If the password is forgotten, it can be erased by removing the battery and waiting for the information in the non-volatile memory to be lost. It can also be destroyed by downloading the setup information — whether successful or not.

The operation of the terminal is unaffected if the password system is not utilized.