The Freedom™ 100
User's Manual

Liberty Electronics

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

Scope of this Manual

This Manual is a reference guide for users of the Freedom™ 100 CRT Terminal. It has been written to give you enough information to set up and use the Terminal with a minimum of effort. The manual does NOT include technical details about the electronics or the internal workings of the Freedom™ 100, but does include enough detail to allow you to program and operate it easily and efficiently.

General Information

Liberty Electronics

Liberty Electronics USA is a subsidiary of Liberty Electronics International, which has several other subsidiaries worldwide. In order to avoid confusion, we will refer to ourselves in this manual as just Liberty Electronics.

Safety Precautions

WARNING

Do not open the Freedom™ 100's case, except under the supervision of a qualified repair person—there are dangerously high voltages inside the case.

Since there are no controls or adjustments inside the case which a user would need to change, always leave this to qualified service and repair people.

FCC Required Warning

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.

Manuals

A Service Manual is also available for the Freedom™ 100. Copies of the User's and Service manuals can be obtained from Liberty Electronics, or our Authorized Distributor or Dealer, at the address on the back cover of this manual.

Product Description

The Freedom™ 100 is a full-function, intelligent Video Display Terminal which has the following standard features:

- A 12″ (30.5 cm) diagonal video monitor
- 5 screen tilt positions—5, 7.5, 10, 12.5, and 15 degrees
- An Etched green phosphor screen
- 50/60 Hz operation
- A 24 row by 80 character display area
- A 25th row, for displaying status or user information
- 7 by 9 character display within a 9 by 12 matrix
- 96 ASCII alphanumeric and punctuation symbols
- 32 control character symbols
- 15 special graphics symbols
- 7 other DIP-switch selectable character sets: British/Dutch, Japanese, Danish/Norwegian, Swedish/Finnish, Spanish, French, and German/Swiss
- A lightweight detachable keyboard
- 93 attractively styled keys
- 9 dedicated cursor control keys—left, right, up, down, home, tab, back tab, carriage return, and line feed
- 7 editing functions—Clear, Clear to End of Line, Clear to End Of Page, Line Insert, Line Delete, Character Insert, Character Delete
- 10 Function Keys—F1 through F10, which can be used alone or with Shift to generate 20 individual function codes
- 5 Functional Command Keys—Break, ESC, Block ON/OF, Control, and Print
- 5 styles of cursor display—reverse block, blinking reverse block, underline, blinking underline, and invisible
- Programmable screen attributes, including Normal Intensity, Half Intensity, Reverse Video, Underline, Blinking, Blanked, and combinations of these modes.

- Attributes displayed by character—The Freedom™ 100 does not use display memory to store information about attributes—leaving you with a full 1920 characters of displayed data
- Programmable protection of characters and fields within the display
- Programmable transmission of data only from unprotected fields of the display.
- Block Mode communications—sending a line or a page at a time
- Local Mode—for operation on a stand-alone basis
- Monitor Mode, displaying control characters on the screen instead of executing them
- Keyboard Lock/Unlock under program control
- Optional display wraparound
- Full or half-duplex communications
- Switch-selectable default baud rate from 110-19,200 baud; also programmable remotely, either from the Host computer or from the keyboard, for both Host and Printer interfaces
- Default Switch, Host computer, or Keyboard selectable parity options: Even/Odd/No Parity, Mark or Space default
- Selectable word length: 7 or 8 data bits, with either 1 or 2 stop bits
- An RS-232/20 ma. current loop interface for communication with a host computer
- An RS-232C bidirectional Auxiliary Port which allows the use of a Printer, Modem, or other peripheral with the terminal
- Both XON/XOFF and DTR communcations protocols
- Emulation of 5 popular CRT Terminals: ADM-3A, ADM-5, TeleVideo 910, Hazeltine 1420, ADDS Regent 25—set at power-up by DIP switch
- 115 V AC (+/−10%) at 60 Hz (+/−2%), 230 V AC (+/−10% at 50 Hz (+/−2%), 6.5 W primary power
- Monitor dimensions: H 13.3″×W 14.7″×D 14.4″ (33.55×36.8×36.0 cm)
- Monitor weight: 24 lbs. (10.9 kg)
- Keyboard dimensions: H 3.0″×W 17.6″×D 8.0″ (7.5×44.0×20.0 cm)
- Keyboard weight: 4 lbs. (1.8 kg)
- Operating temperature: 0° to 50°C. (32° to 122°F.)
- Storage temperature: −20° to 65°C (−4° to 149°F.)
- Humidity: 10-95% in the absence of condensation

Warranty

LIMITED WARRANTY

Liberty Electronics warrants that the Freedom™ 100 will be free from defects in material and workmanship for a period of 180 days (six months) from the date of shipment from the factory. Liberty Electronics will repair (or, at its option, replace) any Freedom™ 100 CRT terminal which proves to be defective during this Warranty Period, provided that the terminal is returned to Liberty Electronics as hereinafter provided.

In addition to the initial warranty, Liberty Electronics offers Extended Warranty Contracts (at additional cost), warranting the Freedom™ 100 against defects in material and workmanship for 1 or 2 years beyond the Standard 6-month warranty. These Extended Warranties must be purchased *BEFORE* the initial Warranty expires.

No defective terminal may be returned to Liberty Electronics without a Return Material Authorization (RMA) Number from Liberty Electronics. This number must be included on the shipping container and the packing list when any terminal is returned. To obtain an RMA number, contact Liberty Electronics or our Authorized Distributor or Dealer, at the address on the back of this manual.

Shipment to Liberty Electronics' Authorized Repair Facility shall be at the expense of the Owner of the shipped terminal, and in no case shall Liberty Electronics be liable for costs of shipping or for damages sustained during shipment. Liberty will pay return shipping costs for terminals which are under warranty.

Note: The Freedom™ 100 Warranties do **NOT** cover:

a. Routine maintenance and adjustment required to maintain the Freedom™ 100 for operations specified in the Operator's or Service Manuals.
b. Failure or malfunction which may result from improper maintenance, operation (including hostile environments), or lack of proper care.
c. Damage during shipment.
d. Failure of any component specifically described as being excluded form Warranty in either the Operator's or Maintenance Manuals.
e. Malfunctions arising from connection or interfacing to any other equipment whatever.

LIMITATIONS OF WARRANTY

The foregoing warranties are in lieu of all other warranties, express or implied, including (but not limited to) the implied warranties of merchantability and fitness for a particular purpose. In no event will Liberty Electronics be liable for consequential damages.

NOTE

Outside of the USA, the above warranty may not apply. Check with the Authorized Distributor or Dealer from whom you bought the Freedom™ 100.

Repair Services

You can get repairs for your Freedom™ 100 from:

- Authorized Distributors and Dealers
- Liberty Electronics' Factory Repair Facility
- Your own repair people, with replacement boards from Liberty Electronics

If you have any hardware problem with the Freedom™ 100, first contact the Authorized Distributor or Dealer from whom you bought the terminal.

If you cannot contact your dealer contact our Independent Service Organization or Liberty Electronics directly. You will have to pay the costs of shipping the Freedom™ 100 from your place of business to the Service Center, and also return shipping costs. You will also have to pay standard hourly rates for out-of-warranty repairs. The current rates and charges will be explained when you contact us.

Note: When sending us a terminal for repair, you must have a Return Material Authorization Number, as described in the Warranty included with this manual. Also, please include a detailed written description of what's wrong with the terminal, and the name and telephone number of a responsible technical person whom we can contact, in case of questions.

GETTING STARTED

Receiving Inspection

Before you accept the Freedom™ 100 from the carrier, first check the carton to make sure that it has not been opened; next, check the carton for damage (holes, dents, scrapes, etc.) which might show that the package had been mishandled, dropped or damaged in transit. If you find that it has been opened, or that there is visible damage, DO NOT OPEN THE CARTON. Note the damage on the waybill, and insist that the delivery agent sign the waybill. Notify the carrier, your Distributor or Dealer, and Liberty Electronics immediately.

Unpacking

The Freedom™ 100 is shipped in a sturdy cardboard box, with styrofoam packing and plastic sheeting, to protect it from damage during shipment.

To unpack the Freedom™ 100, carefully slit the sealing tape that secures the top flaps to the box—do not cut the box itself, since you may need it and the styrofoam packing to re-ship the terminal.

Carefully lift out the Keyboard and Monitor Assemblies, and the styrofoam packing piece by piece. If there is any evidence of broken glass in the package as you open it, be extremely careful—the inside coating of all cathode ray tubes (TV tubes) is poisonous. If there is any doubt, use heavy gloves when taking the Monitor Assembly out of the package.

In Case of Damage

If you do find hidden damage when you unpack the Freedom™ 100, immediately notify the carrier, your Distributor or Dealer, and Liberty Electronics. Pictures of the damaged carton or terminal will help when it comes time to file a claim for damages.

The terms of sale for the Freedom™ 100 are F.O.B. San Francisco CA for shipment within the USA, and F.O.B. Taiwan, R.O.C. for shipments outside the U.S.. Liberty Electronics will not be responsible for any damage which happens while the terminal is being shipped, nor will Liberty Electronics repair such damage under warranty.

To recover for shipping damage, you must file a claim with the carrier who transported the terminal. Liberty Electronics will arrange to repair damage incurred during shipment, but will bill you for the cost of the repairs. You must then recover these costs from the carrier, or their insurance company.

Mechanical Check-out

Check the Monitor Assembly and the power cord carefully for damage. Make sure that the power switch on the back of the Monitor Assembly moves freely, and clean the face of the CRT tube with a soft cloth, if necessary.

Next, take the coiled cord which comes out of the Keyboard, make sure that there are no kinks or knots in it, and plug the modular jack at its end into the socket on the right side of the Monitor Assembly.

Figure 1

Power Cords

The Freedom™ 100 is shipped from the factory with a U.S. NEMA Standard 3-pronged plug. If you need a different type of plug, first, make sure that the power cord is NOT plugged into the wall socket (mains), then cut off the plug that is on the cord, and connect whatever plug you need for your local power system.

The wires in the Freedom™ 100's power cord are color-coded as follows:

Green = Earth ground
Black = Primary power (hot)
White = Primary power return (neutral).

Cables and Connections

The Host and Printer Interface connectors on the back of the monitor assembly are Female DB-258 (25-pin RS-232) connectors. Set up the male connectors of the RS-232 cables to the Host Computer and the Printer according to Tables 1 and 2.

Pin #	Signal Name
1	Frame (Protective) Ground (Earth)
2	TxD (Data Output from Terminal)
3	RxD (Data Input to Terminal)
4	RTS (Request To Send—Output)
5	CTS (Clear To Send—Input)
6	DSR (Data Set Ready—optional Input)
7	Signal Ground
8	Carrier Detect—Input to Terminal
20	DTR (Data Terminal Ready—Output
9	20 mA source (+ 12V, no load)
14	20 mA source (+ 12V, no load)
10	Detected Current Loop Data
25	+ Transmit Loop Current
13	− Transmit Loop Current
12	+ Receive Loop Current
24	− Receive Loop Current

Table 1
Host Interface Connector

20ma Current Loop

If you will be using 20ma current loop to communicate with your Freedom™ 100, set up the connectors as shown in Figure 2:

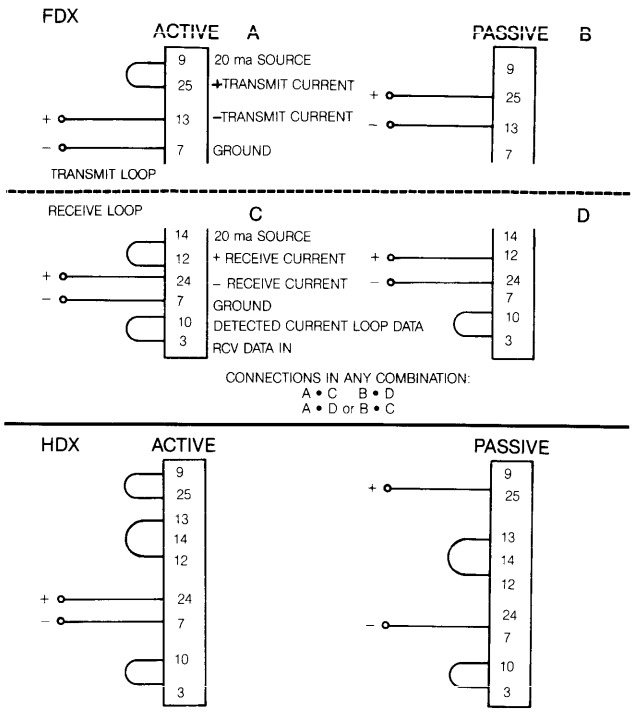

Figure 2

Pin #	Signal Name
1	Frame (Protective) Ground
2	RxD (Transmitted Data—to Aux. Device)
3	TxD (Received Data—from Aux. Device)
4	RTS (Request to Send—from Aux. Device)
5	CTS (Clear to Send—to Aux. Device)
6	DSR (Data Set Ready—to Aux. Device)
7	Signal Ground
8	DCD (Data Carrier Detect—to Aux. Device)
19	Aux. Device Busy Line
20	DTR (Data Terminal Ready—from Aux. Device)

Table 2
Auxiliary Port Interface Connector

Voltage Selection

On the back of the Monitor assembly, there is a switch for choosing either 115V AC or 230V AC. (See Figure 3) Set this switch to whatever voltage your local power lines (mains) carry.

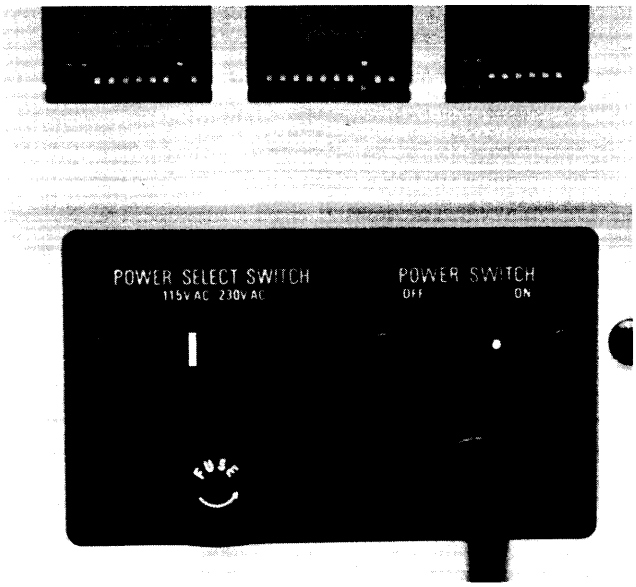

Figure 3

Power On/Off

After you have the power set up, and have chosen the right voltage, plug in the Freedom™ 100 and turn on the power by pressing on the end of the power switch with the white dot (see Figure 3.)

You should hear a "beep" from the keyboard, and the CRT screen should light up slowly, with the cursor blinking in the top left corner.

If the Freedom™ 100 does not start up. turn off the power by pressing on the unmarked end of the power switch, unplug the power cord, and check the fuse on the back of the Monitor Assembly. If it is blown, replace it with a 115V, 1A/230V, 0.5A fuse, plug the Freedom™ 100 back in, and try again.

If the fuse is OK, check to see if there really is power at the outlet (mains)—get an electric lamp or some simple electric appliance, plug it in, and try it.

SETTING TERMINAL PARAMETERS

Contrast

At the front of the Freedom™ 100's monitor assembly, at the bottom right hand corner there is a wheel for adjusting the contrast (brightness or dimness) of the screen. To set the contrast, move the wheel back and forth until the screen looks good to you. We suggest that you do this while a display is on the screen, so that you get a good balance between Normal and Half-Intensity displays.

Setting Default Parameters

There are a number of DIP switches on the back of the Freedom™ 100's monitor assembly (see Figure 4.) which control the DEFAULT settings of various operating parameters for the terminal. When you turn the Freedom™ 100 ON, it checks these DIP switches, and sets the parameters accordingly.

After the power has been turned ON, the DIP switches have no effect, so to change the default parameters, you must set them with < ESC > sequences.

You can change some of these parameters, either from the keyboard or by remote programming from the Host computer, but setting the DEFAULTS saves operator and programming time.

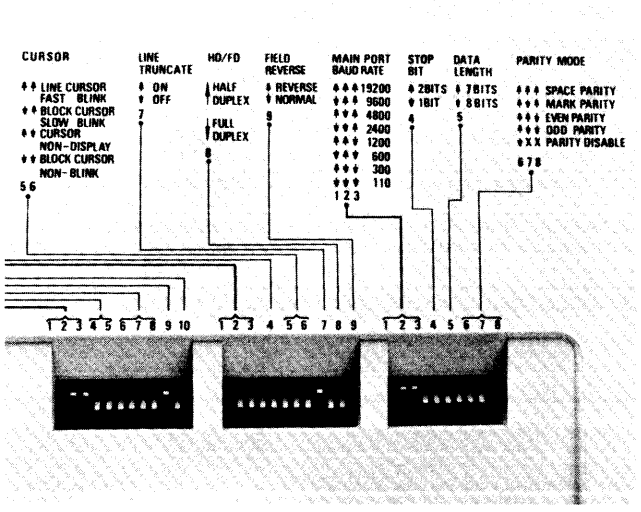

Figure 4.

As you can see from Figure 4, and by looking at the back of the Monitor Assembly, we have included a chart of the settings for the DIP switches on the case of the Freedom™ 100. Any time you need to change the settings, simply turn the Monitor Assembly around, check the chart for the settings you need, and set the DIP switches accordingly.

Using the chart, you can quickly set the:

PRINT PORT BAUD RATE—Switches 1-3 on the Left DIP Switch let you specify any baud rate from 110 to 19,200 baud.

END OF MESSAGE—Switches 4 & 5 let you specify which character will be sent as the End of Message delimiter when the Freedom™ 100 is operating in Block Mode.

INTERNATIONAL CHARACTER SET—Switches 6-8 let you specify which of the 8 character sets you want to display on the screen. Appropriate keycaps may be purchased separately.

SCREEN FREQ—Switch 9 lets you specify the refresh rate for the display screen.

BUSY LABEL—Switch 10 on the Left DIP Switch lets you specify whether a High or Low logic signal on Line 19 of the Printer Port will be recognized as a printer Busy signal.

EMULATION—Switches 1-3 on the Center DIP Switch let you specify which terminal you want the terminal to emulate.

AUTO LF—Switch 4 lets you specify whether the terminal will emit a Line Feed character after every Carriage Return, or not.

CURSOR—Switches 5 & 6 let you specify what the Cursor will look like when it is displayed on the screen.

LINE TRUNCATE—Switch 7 lets you specify whether the terminal will move characters in Column 80 to the next Row down, or discard them, when you insert characters in the middle of a line in Insert Mode.

HD/FD—Switch 8 lets you specify whether the terminal will communicate with the Host Computer in Full or Half Duplix Mode.

FIELD REVERSE—Switch 9 on the Center DIP Switch lets you specify how text will be displayed on the screen. NORMAL is bright characters on a dark background; REVERSE is dark characters on a light background.

MAIN PORT BAUD RATE—Switches 1-3 on the Right DIP Switch lets you specify any baud rate from 100 to 19,200.

STOP BIT—Switch 4 lets you specify how many stop bits the terminal will send after every character it transmits to the Host computer.

DATA LENGTH—Switch 5 lets you specify how many bits of data a character will include.

PARITY MODE—Switches 6-8 on the Right DIP Switch let you specify what kind of parity the terminal will use and expect when communicating with the Host computer.

Monitor Tilt

The Freedom™ 100's Monitor Assembly can be adjusted so that the screen is at a comfortable viewing angle. There are 5 possible positions, from 5 to 15 degrees,which you can select by lifting up on the front edge of the Monitor Assembly and moving the Monitor Support, as shown in Figure 5:

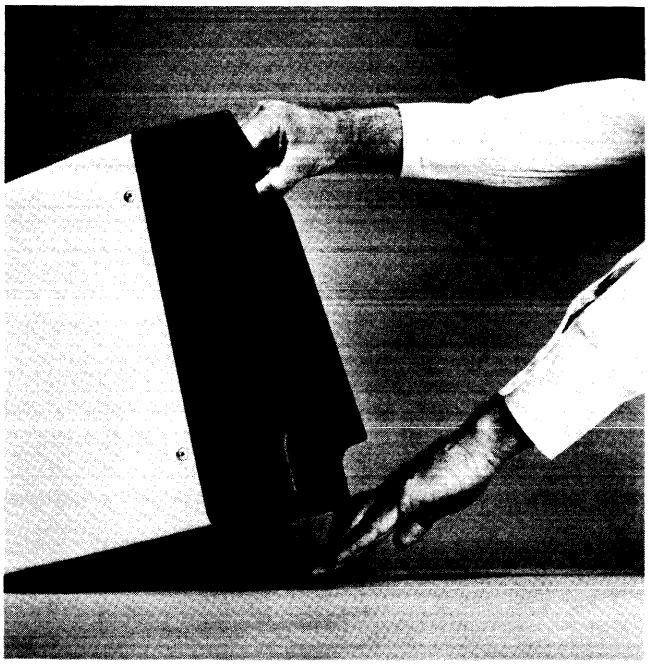

Figure 5.

THE KEYBOARD

The Freedom™ 100's keyboard has 93 keys, which can be divided into 6 groups:

Alphanumeric Keys

The Letter and Number keys are arranged like a normal typewriter keyboard, so that typists will be familiar with it.

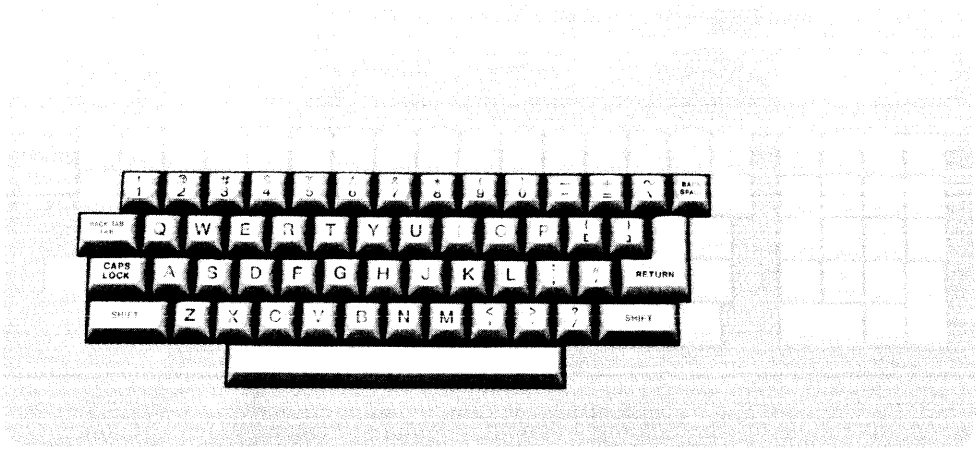

Figure 6.

Numeric Keypad

Just to the right of the typewriter style keyboard, there is a numeric keypad, with the keys arranged like a normal 10-key calculator. This keypad allows you to enter numeric data quickly and accurately.

The <ENTER> key operates like the <RETURN> key, except in Block Mode, where it is used to send a whole screen of information to the Host computer. (See the discussion of Operating Modes on Page 28, for a fuller explanation of Block Mode.)

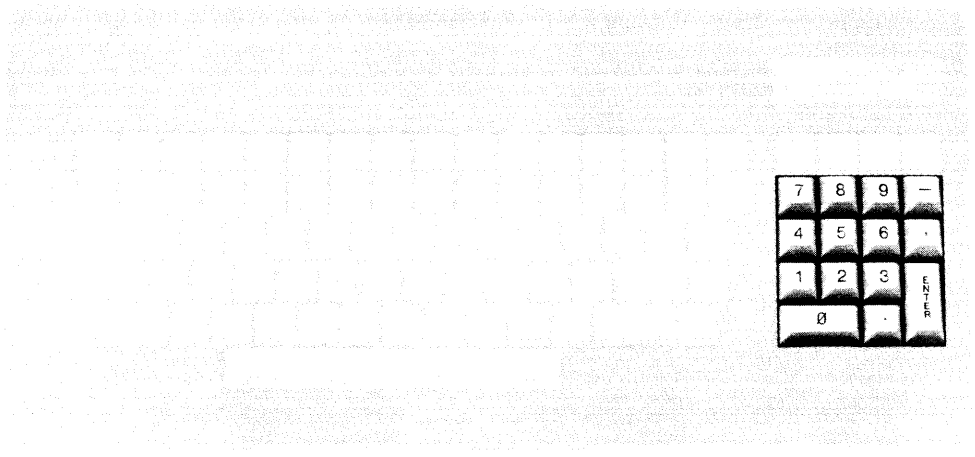

Figure 7.

Cursor Control Keys

The Freedom™ 100 has a group of keys which control the movement of the cursor on the screen:

The < Arrow > keys (Up, Down, Right, and Left) move the cursor in the directions that they point.

The < RETURN > key moves the cursor back to the left side of the screen, and the Line Feed key moves it down one line.

The <HOME > key moves the cursor to the top left corner of the screen.

The < TAB > key causes the cursor to move right several spaces, depending on the tab settings in your program. Pressing the Shift and Tab keys at the same time causes the cursor to Back Tab—move to the left, depending on your program.

In addition, the terminal lets you set Tab Stops at any Column position on the screen by placing the cursor in the column where you want a Tab Stop, and pressing <ESC > and the < 1 >. Thereafter, when you press < TAB > or < BACKTAB >, the cursor will move left or right to the nearest Tab Stop. To delete a particular Tab Stop, send a < ESC>< 2 >, and to delete ALL Tab Stops, send an <ESC >< 3 >.

If Write Mode is ON, pressing < TAB> or <BACK-TAB > will move the cursor right or left to the next unprotected field on the screen—regular Tab Stops, however, will be inoperative.

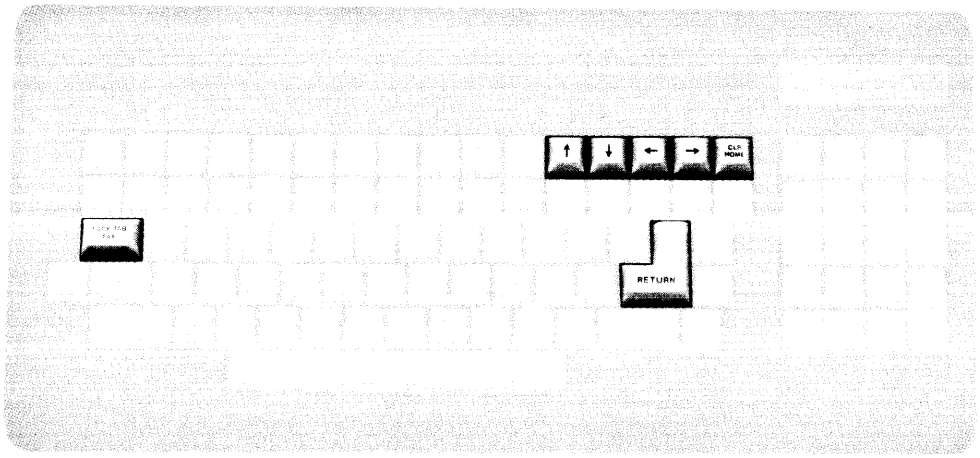

Figure 8.

Editing Keys

NOTE: The abbreviations "EOL" and "EOP" stand for End Of Line and End Of Page.

There are 8 keys for quick editing:

Pressing <SHIFT> and the <CLEAR/HOME> key will clear all unprotected characters from the screen, and put the cursor at the first unprotected character position, ready for new data.

The<EOP/CLEAR/EOL>key clears unprotected characters which are to the right of and below the cursor. Pressing this key alone will clear characters from wherever the cursor is, to the end of the line that it is on. Pressing the<SHIFT>key at the same time will clear all characters from the cursor position to the bottom of the screen.

The<INS/LINE/DEL>key inserts and deletes entire lines. Pressing this key alone will delete an entire line, and cause all of the lines below it to move up. Pressing the<SHIFT>key at the same time will cause the line on which the cursor is sitting to move down one row, leaving the cursor on a blank line. (See the discussion of Block Mode on Page 28 for more information about how this key works.)

The<INS/CHAR/DEL>key inserts and deletes single characters. Pressing this key alone will delete the character at the cursor position, causing all the other characters on the line to move left one space. Pressing the<SHIFT>key at the same time will cause all the characters to the right of the cursor to move right one space, leaving a new blank space under the cursor. (See the discussion of Block Mode on Page 28 for more information about how this key works.)

The<RUB OUT>key (sometimes called<DEL>or<DELETE)>sends a character to the computer which tells it to delete the last character sent. Depending on the program you are working with, this may cause the character to disappear, or it may print a block of dots on the screen.

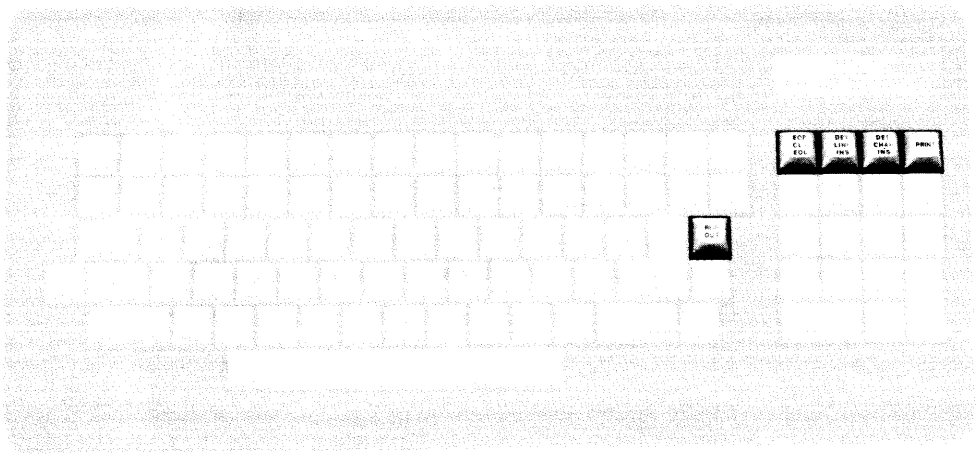

Figure 9.

Function Keys

There are 10 Function keys on the top row of the Freedom™ 100's keyboard, marked F1 - F10:

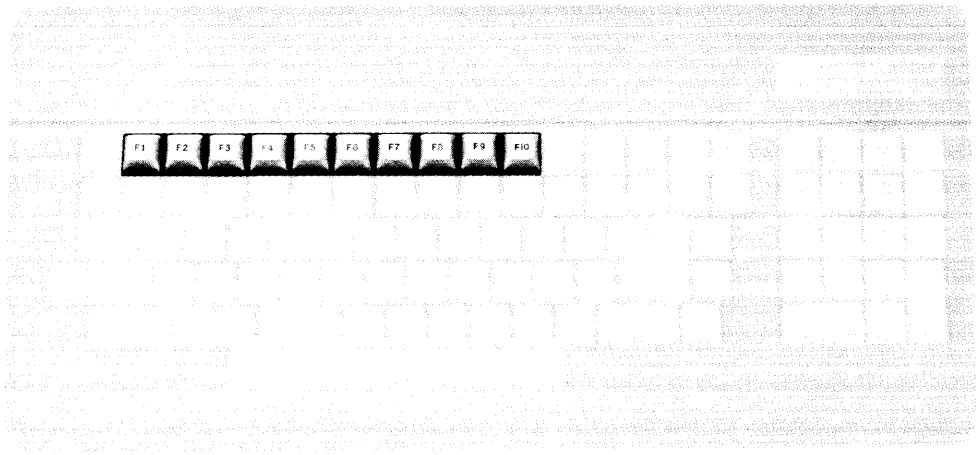

Figure 10.

These keys produce the following codes when pressed.

Key	Unshifted Hex	Unshifted Characters	Shifted Hex	Shifted Characters
F1	01 40 0D	CTL-A @ CR	01 60 0D	CTL-A ` CR
F2	01 41 0D	CTL-A A CR	01 61 0D	CTL-A a CR
F3	01 42 0D	CTL-A B CR	01 62 0D	CTL-A b CR
F4	01 43 0D	CTL-A C CR	01 63 0D	CTL-A c CR
F5	01 44 0D	CTL-A D CR	01 64 0D	CTL-A d CR
F6	01 45 0D	CTL-A E CR	01 65 0D	CTL-A e CR
F7	01 46 0D	CTL-A F CR	01 66 0D	CTL-A f CR
F8	01 47 0D	CTL-A G CR	01 67 0D	CTL-A g CR
F9	01 48 0D	CTL-A H CR	01 68 0D	CTL-A h CR
F10	01 49 0D	CTL-A I CR	01 69 0D	CTL-A i CR

Table 3.—Function Key Codes

Your application program must recognize these keys, and decide what action to perform when it sees them.

Functional Command Keys

The < CTRL > key works with the "@", "A"...."Z", "[", " ", "]", " ^", "_" keys to generate the ASCII Control characters from 00 to 1F (hexadecimal—0 to 31 decimal) which are used by some computer systems for passing control information.

The<ESC>key generates the ASCII Escape character, which indicates that the next character or characters has some special meaning to the computer system.

The<BLOCK>key switches the Block Mode ON if it is off, or OFF if it is on, so that the Freedom™ 100 can send data to the computer either one character at a time, or a whole page at a time, depending on what the Host computer needs.

The<PRINT>key causes the Freedom™ 100 to send all of the characters on the screen to the printer via the Printer Interface connector on the back of the Monitor Assembly.

The<BREAK>key sends a special signal to the Host computer via the RS-232 interface, indicating that something unusual is happening—some Host computer systems need to see the BREAK signal to recognize that a terminal is now active, and needs attention, others use BREAK as a signal to quit whatever they are doing, and get new instructions from the terminal.

Figure 11.

THE SCREEN

The Freedom™ 100 can display a total of 25 lines on its CRT screen:

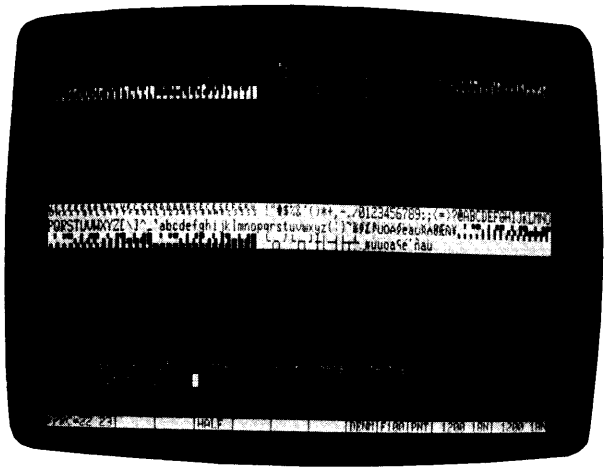

Figure 12.

Text Lines 1-24

The top 24 lines of the Freedom™ 100's screen are for entering text and data. Data typed in at the keyboard, or data from the Host computer normally appears here.

Line 25—Status or User Display

The 25th line of the screen is usually a Status line, telling you where the cursor is on the screen, and what operating parameters have been selected:

Row & Column

At the left end of the Status line, the letters <RC=> show what Row and Column the Cursor is at. The first three digits show what row (line) the Cursor is on. These digits will vary from <001> to <024>.

The next pair of digits show what column (character position on the line) the Cursor is on. These digits will vary from <01> to <80>.

Editing Mode

Just to the right of the center of the screen, there is a block with 4 letters in it. This block shows what edit mode the Freedom™ 100 is in.

The Editing Modes are:

EDTL—EdiT a Line at a time
EDTP—EDiT a Page at a time
INSL—INSert a Line at a time
INSP—INSert a Page at a time

Edit Mode (either Line or Page at a time) is the mode which you will use most often. This mode replaces characters on the screen with whatever you type in, or with whatever characters the Host computer sends to the terminal.

Insert Mode lets you add data on the screen without erasing any of the characters which are already there. The Freedom™ 100 will move any text or data on the screen to the right or down a line, to make room for whatever you type in.

Page Editing Mode enables the wraparound feature for Insert Mode, and when using the Character Insert and Character Delete keys. When a Character is inserted on a line all of the characters move right one column, and the character in Column 80 moves to Column 1 of the next line.

The character in Column 80 of Row 24 (bottom right corner of the screen) is forced off and lost. Similarly, when deleting a character, all characters move left 1 column, and characters in Column 1 move to Column 80 of the line above.

Line Editing Mode disables the wraparound feature, and inserting or deleting affects only the line where the cursor is—characters in Column 80 are lost when inserting new characters, and the Freedom™ 100 inserts blanks (or other Insert Character) in Column 80 when deleting.

Local Edit Mode means that character sequences sent by the CHARacter INSert or LINE DELete keys affect the screen, but are not sent to the Host computer.

In Conversational Edit Mode, the sequences sent by the editing keys are sent to the Host computer.

You can change the Edit Mode from the keyboard, or by sending character sequences from the Host computer.

Pressing the <ESC> key signals the Freedom™ 100 that you want to change modes. The next key you press will tell it which mode to go to:

<k> puts it in Local Edit Mode
<l> puts it in Conversational Edit Mode
<q> puts it in Insert Mode
<r> puts it in Edit Mode
<N> puts it in Line Mode

You can also have the Host computer send <ESC><k>, <ESC><l>, etc., to change from one editing mode to another, under program control.

Keyboard Lock

The Freedom™ 100 lets you lock the keyboard, so that no data or text can be typed in, until it is unlocked again. This feature is very handy for applications where data integrity and security are important.

The Status Line block just to the right of the Edit Mode block shows whether the Keyboard Lock is on or off. Normally, it will appear as 4 reversed blanks (light green background). When the Keyboard is locked, the letters

< KLOK > will appear in dark letters in this block.

Pressing the < ESC > key, then pressing < # > will lock the keyboard, while <ESC> <" >will unlock it. You can also lock and unlock the keyboard remotely by sending the < ESC > < # > and < ESC > < " > sequences to the Freedom™ 100 from the Host computer.

Write Protect Mode

The block on the Status Line which is just to the right of the Keyboard Lock block shows whether there are any Write Protected fields or characters on the screen. This block is normally 4 reverse blanks, but if Write Protect Mode is ON, the dark letters <PROT > will appear in the block.

Graphics Mode

The block on the Status Line just to the right of the Protection block shows whether the Freedom™ 100 is in Normal, Graphics, or Write Protect Mode. Normal is indicated by a light green background, Graphics by the dark letters <GRPH >, and Write Protect by the dark letters < W.P.> .

Communications & Operational Modes

The Status Line block to the right of the Graphics mode block shows which Transmission Mode the Freedom™ 100 is using.

If the Freedom™ 100 is in Local or Block Mode, the Status Line block just to the right of the Graphics Mode Block will display < LOC > or < BLK >. Otherwise, it will show the Transmission Mode— <FDX> or <HDX> .

Full Duplex is set by the sequence <ESC> <D> <F >, Half Duplex by <ESC> < D > <H> .

For more information on these modes, see <Transmission & Operating Modes>, on Page 28.

Character Sets

Normal Alphanumeric

The Freedom™ 100 can display the entire ASCII character set:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqustuvwxyz
0123456789
!"#$%&'()*+,-./:;<=>?@[\ ]^_` {|}

as well as <SPACE> (< >) and < DEL > (which appears as an irregular block of dots).

Graphics

The Freedom™ 100 lets you display the 16 Special Graphic symbols, from which you can build "forms" or draw simple pictures:

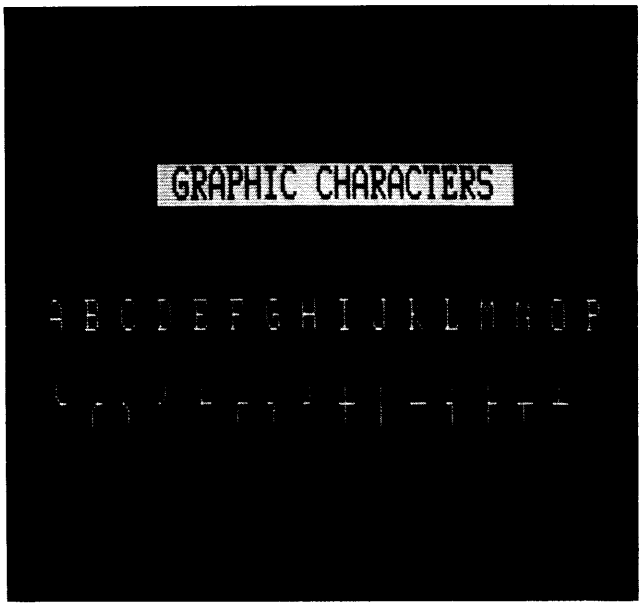

Figure 13.
Special Graphics Characters

When the Freedom™ 100 is in Special Graphics Mode, these characters are displayed on the screen instead of the letters < A > through < P >. (<P> prints a space.)

You can set Graphics Mode from the keyboard or the Host computer by sending the sequence < ESC > < $ >. Sending < ESC > < ' > will reset the Freedom™ 100 to Normal Mode.

Video Attributes

The Freedom™ 100 lets you display characters on the screen with any of several attributes:

Normal
Blink
Blank
Reverse
Underline
Half Intensity

or any combination of these. The Freedom™ 100 does not use display memory to store the attribute code—you get a full 1920 characters displayed on the screen.

You can set the display attributes by sending the sequence < ESC > < G >, followed by a one-character code.

For more information on the Display Attributes, and how to set them, see the discussion of < ESC > < G >, on Page 37.

Screen Clearing Functions

The Insert Character

The normal character used to clear the CRT screen is the ASCII Space character (32 Decimal, 20 Hex, 040 Octal). Some programs, however, require an ASCII Null character (00 in Decimal, Hex and Octal) as a "placeholder" in any position on the screen which does not have valid data in it. Other programs, which lay out the screen as a form to be filled in, require different characters to indicate areas where data can be entered (Zeros on an all-numeric "preprinted form", for instance).

The Freedom™ 100 normally uses the ASCII Space character to clear the screen, but allows you to specify whatever ASCII character you need as the Insert Character which clears text from the screen.

By sending the sequence:

<ESC><e> {Insert Character}

either from the keyboard or from the host computer, you can specify which character the Freedom™ 100 will use to clear the screen. The Line and Character Insert keys will use this Insert Character to fill in spaces when you press them.

thereafter, you can use <ESC><;>, <ESC><+> or <Ctrl Z> (the code put out by the Clear/Space key on the Freedom™ 100 keyboard) to clear all the unprotected areas on the screen to the character you specified.

Other Clearing Functions

If you send the character sequence <ESC><,> to the Terminal, the Freedom™ 100 will clear the screen to blanks which have the Write Protect Attribute. (See the explanation of <ESC><p> {code} on page 38.)

If you send the sequence <ESC><:> it will clear all unprotected fields to ASCII Nulls.

If you send the sequence <ESC><*> it will clear the whole screen to ASCII Nulls, turn OFF Write Protect mode, and reset the Display Attribute. (See the explanation of <ESC><G> {code}, on Page 37.) The Freedom™ 100 will then operate as a normal CRT terminal: Data can be entered anywhere on the screen, and will appear as bright letters on a dark background.

TRANSMISSION & OPERATING MODES

Transmission Modes

The Freedom™ 100 has two Transmission Modes:

Full Duplex Mode

In this Mode, the Freedom™ 100 transmits every character typed in at the keyboard to the Host computer via the Main RS-232 Port on the back of the Monitor Assembly. The Host must then decide what to do in response to the character it has received. In the majority of cases, it will simply echo the character back to the terminal, and the Freedom™ 100 will display it on the screen (or take some action, if it is a Control Character such as <CR>). The Host program may send a different character or characters, however, such as instructions for random Cursor positioning.

In essence, the Freedom 100 sends character strings to the Host, and then displays or executes whatever the Host sends back.

Half Duplex Mode

In this Mode, the Freedom™ 100 sends character strings to the Host computer, and displays or executes them without waiting for the Host to echo them back. It will also respond to strings of characters sent from the Host, displaying or executing them, as appropriate.

In both Half and Full Duplex Modes, the Freedom™ 100 depends on the Host computer for all editing and most screen control functions. It acts as a "dumb" terminal.

Operating Modes

Local Mode

In Local Mode, the Freedom™ 100 does not communicate with the Host Computer—it does not send characters over the Main RS-232 Port and does not receive signals from it, either. It does, however, send and receive signals via the Printer Port, so that you can compose text on the screen, and then send it to the Printer by pressing the <PRINT> key.

Block Mode

In Block Mode, the Freedom™ 100 does not communicate with the Host computer until you press the <ENTER> key. It will, however, respond to commands and characters received from the Host.

When you do press the <ENTER> key to send information to the Host computer, the Freedom™ 100 may include certain ASCII codes as delimiters which mark the beginning and end of fields, the ends of lines, and the end of text. These delimiters are;

<FS> = Beginning/End of a Field
<US> = End of a Line
<ESC><)> = Beginning of Write Protection
<ESC><(> = End of Write Protection
<CR> = End of Text

You can use <ESC><0> {code} to program the Send Function with any one of 6 options. The options are:

Send Line Unprotected—<ESC><4>—sends all unprotected characters on the current line, from column 1 to the column where the cursor is. It also sends a single <FS> instead of Write Protected character strings, and ends the transmission with a <CR>.

Send Page Unprotected—<ESC><5>—sends all unprotected characters on the page from Row 1, Column 1 to the current Cursor position, sends a single FS instead of Write Protected fields, ends lines with a <US>, and ends the transmission with a CR .

Send Line All—<ESC><6>—sends all characters on current line, from Column 1 to the Cursor position, adding <ESC><)> and <ESC><(> before and after Write Protected fields. If the character under the cursor is Write Protected, it is sent, and then an <ESC><(> is sent. <CR> is sent at the end of the transmission.

Send Page All—<ESC><7>—sends all characters on the page, from Row 1, Column 1, to the current Cursor position; otherwise similar to <Send Line All>.

Send Message Unprotected—<ESC> <S>—sends all characters on the which lie between <STX>and <ETX> (Start & End of TeXt) characters. Cursor is left at the <ETX>. If there is no <STX>, transmission starts from Row 1, Column 1. If there is no <ETX>, transmission ends with the character in Row 24, Column 80 (bottom right corner). Also sends <FS> instead of Write Protected fields. <US> at End of Line, and <CR> at end of transmission. The Cursor is positioned at Row 1, Column 1 after the transmission.

Send Message All—<ESC><s>—similar to Send Message Unprotected, except that it sends all characters, delimiting Write Protected fields with <ESC><)> and <ESC><(>.

Write Protect Mode

The Freedom™ 100 lets you protect any character or group of characters on the screen so that they cannot be overwritten. When it receives the sequence <ESC><)>, the terminal will set the Protect Attribute for all of the following characters it receives until it gets an <ESC><(>.

It will also Set the Display Attribute for all of these characters to the current Write Protect attribute, which is set by the sequence <ESC><p> {code} .

When Write Protect Mode is turned ON by the sequence <ESC><&>, these characters will be protected form overwriting until you send the sequence <ESC><'> to turn Write Protect Mode OFF.

See the discussions of <ESC><)>, etc., on Page below.

Write Protect Mode lets you create "preprinted forms" on the screen, so that you can enter and send to the Host computer only the information which can change, without the "line numbers" and other formatting information that the operator may need to understand the "form". This cuts down the Host's workload since the fewer characters it has to deal with, the more time it has to do the actual data processing.

To set up a "form", the first thing you need to do is to define how the Write Protected areas will look, by setting the W.P. attribute with <ESC><p> {code} (The codes are listed on Page 37, in the discussion of <ESC><G>). If you don't explicitly load a different attribute, the Freedom™ 100 will display Write Protected characters in Half Intensity Normal format.

If you wanted to display W.P. fields as Half Intensity Reverse, you would send the terminal <ESC> <p><D>, for instance.

Next,clear the screen to ASCII blanks with the W.P. attribute Set by sending: <ESC><,>.

Next, write the "form" on the screen by sending the text that you want to appear on the "form", Begin each Protected field with an <ESC><)>, write the descriptive text or graphics on the screen, then end it with an <ESC><(>.

Next, set the Display Attribute for the unprotected field, if you want to make it different from the normal default attribute, and write as many spaces as the input data will require.

Begin Protection again with an <ESC><)>, and so on, until you have written the whole screen.

So far, all you have done is to specify which fields on the screen are to be protected or unprotected, but have NOT actually turned the Write Protection Mode ON—you can still write over any character on the screen.

To turn ON Write Protection, send the terminal an <ESC><&>.

Data can now be entered only in unprotected fields, and the <TAB> and <BACKTAB> will move the cursor from one unprotected field to the other.

After you have finished entering data using the "form", and want to go back to the terminal's normal unprotected editing mode, send it an <ESC><'> (1B 27 Hex) to turn OFF Write Protection.

Monitor Mode

The Freedom™ 100 has a special Monitor Mode, which lets you see which ASCII codes have been sent by the terminal or the Host computer. Instead of performing the action (like a Line Feed) specified by the character, a small two-letter abbreviation is printed on the screen. This can be very helpful in finding software problems, such as extra characters inserted in strings, and in showing where the various delimiters are when operating in Block Mode.

The following table lists the two-letter abbreviations for the ASCII control codes:

Screen Code	Hex Code	Key Sequence	Description
NU	00	CTRL @	NUL—NULL
SH	01	CTRL A	SOH—Start Of Heading
SX	02	CTRL B	STX—Start of TeXt
EX	03	CTRL C	ETX—End of TeXt
ET	04	CTRL D	EOT—End of Transmission
EQ	05	CTRL E	ENQ—ENQuiry
AK	06	CTRL F	ACK—ACKnowledge
BL	07	CTRL G	BEL—BELL
BS	08	CTRL H	BS—Back Space
HT	09	CTRL I	HT—Horizontal Tabulation
LF	0A	CTRL J	LF—Line Feed
VT	0B	CTRL K	VT—Vertical Tabulation
FF	0C	CTRL L	FF—Form Feed
CR	0D	CTRL M	CR—Carriage Return
SO	0E	CTRL N	SO—Shift Out
SI	0F	CTRL O	SI—Shift In
DL	10	CTRL P	DLE—Data Link Escape
D1	11	CTRL Q	DC1—Device Control 1
D2	12	CTRL R	DC2—Device Control 2
D3	13	CTRL S	DC3—Device Control 3
D4	14	CTRL T	DC4—Device Control 4
NK	15	CTRL U	NAK—Negative AcKnowledge
SY	16	CTRL V	SYN—SYNchronize Idle
EB	17	CTRL W	ETB—End of Transmission Blk
CN	18	CTRL X	CAN—CANcel
EM	19	CTRL Y	EM—End of Medium
SB	1A	CTRL Z	SUB—SUBstitute
EC	1B	CTRL [	ESC—ESCape (ESC key)
FS	1C	CTRL\	FS—File Separator
GS	1D	CTRL]	GS—Group Separator
RS	1E	CTRL ^	RS—Record Separator
US	1F	CTRL _	US—Unit Separator

Table 4. Monitor Mode Screen Characters

Printing Modes

The Freedom™ 100 has 2 Printing Modes, for use when a printer is connected to the Auxiliary (Printer) Interface Port on the back of the Monitor Asembly:

Simultaneous Print Mode

This mode lets you send information from the Host computer both to the Freedom™ 100's screen and to a printer connected to the Printer Port on the back of the Monitor Assembly.

To turn ON Simultaneous printing, send the terminal an <ESC><@>. To turn it OFF, send an <ESC><A>.

Note: In both Print Modes, you can enable XON/XOFF handshaking with the Printer (Printer send XOFF when its buffer is almost full, and XON when it is almost empty) by sending the Freedom™ 100 a < CTRL N >. To turn it OFF, send a <CTRL O>.

Buffer Print Mode

When Buffer Print Mode is ON, characters from the Host computer are stored in a buffer in the terminal, and NOT displayed on the screen. The terminal will send the characters to the printer at whatever baud rate the Printer Port has been set to.

To turn Buffer Print ON, send the terminal an <ESC><' >(13 60 Hex), and to turn it OFF, send an <ESC><a>.

Note: In both Print Modes, you can enable XON/XOFF handshaking with the Printer (Printer sends XOFF when its buffer is almost full, and XON when it is almost empty) by sending the Freedom™ 100 a < CTRL N >. To turn in OFF, send a <CTRL O>.

CUSTOMIZATION

Standard Keycap Set—Languages Supported

The Freedom™ 100 is normally shipped from the factory with U.S.A. Standard Code for Information Interchange (ASCII) keycaps.

For a nominal fee, keycaps for standard UK/Netherlands, Japanese, Danish/Norwegian, Swedish/Finnish, Spanish, French, and German/Swiss character sets can be provided.

Non-Standard Customization

In addition to character sets and keycaps, Liberty Electronics is prepared to provide OEMs and other volume customers with a broad range of customization services.

For further information, price quotes, and delivery schedules, contact Liberty Electronics at the address on the back cover of this Manual.

TERMINAL PROGRAMMING COMMANDS

Overview

The Freedom™ 100 provides great flexibility in setting its operating parameters—they can be set as power-up defaults by the DIP switches on the rear of the Monitor Assembly, changed interactively from the keyboard, or controlled from the Host computer. The following sections describe the Control and Escape sequences which set and alter the operating parameters.

The notation "(Default=ON)" means that the command is in force when the Freedom™ 100 is turned ON, and remains in force until you change it.

General Terminal Commands

CTRL-G—Bell
<CTRL-G> causes the small loudspeaker in the Keyboard Assembly to emit a 300 ms. beep, to get the operator's attention.

ESC #—Lock Keyboard
<ESC><#> will lock the keyboard, so that nothing entered by the operator will have any effect on the screen display.

ESC "—Unlock Keyboard
<ESC><"> will unlock the keyboard, so that normal keyboard entry can continue. (Default=ON)

ESC > —Keyclick ON
<ESC> ">" will turn the keyclick function ON—whenever any key on the keyboard is pressed, the loudspeaker in the Keyboard Assembly will emit a 100 ms. beep to verify that a key entry has been made. (Default=ON)

ESC < —Keyclick OFF
<ESC> "<" will turn the Keyclick function OFF—experienced operators often find the keyclick unnecessary and irritating.

ESC @—Simutaneous Print ON
<ESC><@> will send all characters received from the keyboard or the Host computer to both the CRT screen and the Printer Port on rear of the Monitor Assembly. In effect, it will print on both the screen and the printer.

ESC A—Simultaneous Print OFF
<ESC><A> will quit sending received characters to the Printer Port, and only print to the CRT screen. (Default=ON)

ESC B—Block Mode ON
<ESC><B> will set Block Mode—data will be sent to the computer in blocks, but only when the <ENTER> key is pressed.

ESC C—Block Mode OFF (Conversational Mode ON)
<ESC><C> will send data input on the keyboard to the Host computer character-by-character, as it is entered. (Default=ON)

ESC —Buffer Print ON
<ESC><'> will send all characters received from the Host computer directly to the printer connected to the Printer Port, without displaying them on the CRT screen.

ESC a—Buffer Print OFF
<ESC><a> will quit sending received characters to the Printer Port, and will send them to the CRT screen. (Default=ON)

ESC ^ —Bell ON
<ESC><^> will turn the Bell ON, so that whenever it receives the ASCII character "07", it will make the small loudspeaker in the Keyboard Assembly emit a beep. (Default=ON)

ESC_—Bell OFF
<ESC><_> will turn OFF the Bell function, and not emit any beeps when it gets ASCII "07".

ESC e {Char} —Load Insert Character
<ESC><e> {any character} will cause the Freedom™ 100 to use the character as the default character for clearing the screen. The Freedom™ 100 to use the character as the default character for clearing the screen. The Freedom™ 100 normally uses <Space> (Hexadecimal 20) as the Insert Character for clearing the screen, and provides commands for setting unused character positions to <NUL> (Hexadecimal 00), as well as other characters.

ESC F {code} CR—Display Control Code
<ESC><F> {Control Character (ASCII 0 - 1F Hex)} will cause that Control Character to be displayed on the screen and not executed. The list of 2-letter Control Code abbreviations is on Page 30.

ESC f {Text} CR—Load User Line
The Freedom™ 100 normally displays the status of its operating parameters on the 25th line of the CRT screen. It is possible, however, to display up to 80 characters of User information on this line.
<ESC><f> {up to 80 characters of text} <CR> will store the text in the Freedom™ 100's User Line memory, ready for display.

ESC g—Display User Line
<ESC><g> will display the text stored in the User Line memory on the 25th line of the CRT screen.

ESC h—Display Status Line
< ESC > < h > will display the Status Line (operating parameters) on the 25th line of the CRT screen.

ESC L—Unformatted Print
< ESC > < L > will send all of the characters on the screen, from Row 1, Column 1 (top left) to the Cursor position, to the Printer via the Auxiliary Port on the back of the Monitor Assembly. It does not add a < CR > < LF > at the end of a line, or at the end of the transmission. The terminal will send an < ACK > to the Host computer when it finishes transmitting the data.

ESC P—Print (also the < PRINT > key)
< ESC > < P > will send to the Printer Port all characters between Row 1, Column 1 (the top left corner of the screen) and the cursor. Characters to the Right and Below the Cursor are not sent. It will send a < CR > < LF > at the end of every line, and at the end of the transmitted data, as well as an < ACK > to the Host computer when it finishes.

ESC U-Monitor Mode ON
< ESC >< U >will turn on the Monitor Mode—control characters (Hexidecimal 00 to 1F) will be printed on the screen as 2-letter abbreviation, instead of being executed. (See the discussion of Monitor Mode on Page 38, for a list of the abbreviations).

ESC u or ESC X—Monitor Mode OFF
< ESC > < u > or < ESC > < X > will turn off the Monitor Mode—after the sequence of characters is entered and written to the CRT screen, all control characters (Hexadecimal 00 to 1F) will be interpreted as commands, and not printed as 2-letter abbreviations. (Default = ON)

Cursor Control Commands

CTRL H—Backspace
< CTRL-H > (Hexadecimal 08) will move the cursor left 1 column on the screen, without altering any of the characters on the screen. If the cursor was on Column 1 of any Row and Wraparound in ON, it will move to Column 80 of the Row above. If Wraparound is OFF, the cursor will not move. (Both the < BACK SPACE > and < Left Arrow > keys cause the Freedom™ 100 to issue a < CTRL-H > .)

CTRL I—Tab
< CTRL-I > (Hexadecimal 09) will print several < Space > characters (Hexadecimal 20) on the screen until the cursor reaches the next defined Tab Stop. (See < ESC 1 >, below, for how to set Tab Stops) (The < TAB > key causes the Freedom™ 100 to issue a < CTRL-I > .)

CTRL J— Line Feed
< CTRL-J > (Hexadecimal 0A) will move the cursor down 1 row on the screen, leaving it on the same column, without altering any of the characters on the screen. If Scrolling in ON, a < LF > will cause the screen to scroll if the Cursor is on the 24th (bottom) Row. (The < LINE FEED > and < SHIFTed DOWN-ARROW > keys issue a < CTRL-J > .)

CTRL K—Cursor Up (Up Arrow)
< CTRL-K > (Hexadecimal 0B) will move the cursor up 1 row on the screen, leaving it on the same column, without altering any of the characters on the screen. If the cursor is on Row 1 (the top line), it will not move upwards, nor will it cause the screen to scroll down. (The < UP-ARROW KEY > issues a < CTRL-K > .)

CTRL L—Cursor Right (Right Arrow)
< CTRL-L > (Hexadecimal 0C) will move the cursor right 1 column, leaving it on the same row, without altering any of the characters on the screen. If wraparound in ON and the cursor is in Column 80, the cursor will move to Column 1 of the next Row. If Wraparound is OFF, and the cursor is in Column 80, it will not move. (The < RIGHT-ARROW > key issues a < CTRL-L > .)

CTRL M—Carriage Return (Return)
< CTRL-M > (Hexadecimal 0D) will move the cursor to Column 1 (the left end) of the Row that it is on. (The < RETURN > key issues a < CTRL-M > .) If AUTO LF is ON, the terminal will also issue a < LF > (< CTRL-J >, 0A Hex).

CTRL V—Cursor Down (Down Arrow)
< CTRL-V > (Hexadecimal 16) will move the cursor down 1 row on the screen, leaving it in the same column. If the cursor was on the 24th line, it will not move below the 24th line. (The < Down Arrow > key issues a < CTRL-V > .)

CTRL ^ —Home
< CTRL ^ > (Hexadecimal 1E) will move the cursor to Row 1, Column 1 (the top left-hand corner of the CRT screen, without altering any of the characters on the screen. (The < HOME > key issues a < CTRL ^ > .)

CTRL _—New line (< CR > & < LF >)
< CTRL _> (hexadecimal 1F) will move the cursor to Column 1 of the row below, effectively issuing a Carriage Return and a Line Feed, without altering any of the characters on the screen. (No single key on the keyboard will duplicate this command—it is provided as a convenience to the programmer.)

ESC [{code} —Set Cursor Row Position
< ESC > < [> {code} will move the Cursor to the position in the current row specified by the code. The codes are the same as those which are used to do random X-Y cursor positioning—add the desired cursor position

to 20 hex, and use the ASCII character specified by that hex value. (See Table 5, on Page 36, below)

ESC] {code} —Set Cursor Column Position

<ESC><]> {code} will move the Cursor up or down in the same Column, to the position specified by the code. The codes are the same as the ones used for random X-Y cursor addressing. (See Table 5, on Page 36, below)

ESC 1—Set Tab

<ESC><1> will set Tab Stop at the Column position where the Cursor is located. The Freedom™ 100 will remember the Tab Stop, and you may use the <TAB> key to go to this column position at any time.

ESC 2—Clear Tab

<ESC><2> will clear any Tab Stop which may exist at the cursor position.

ESC 3—Clear All Tabs

<ESC><3> will clear ALL Tab Stops which have been set.

ESC = {Row} {Column} —Random Cursor Addressing

<ESC><=>{Row Character} {Column Character} will move the cursor to the position specified by the Row and Column characters.

The Row and Column characters are generated by adding the Row or Column number desired to the value of the ASCII <Space> character (32 Decimal, 20 Hex), as illustrated in the following table:

Row/Col Number	ASCII Char	Hex Code	Decimal Code	Octal
1	<SP>	20	32	40
2	!	21	33	41
3	"	22	34	42
4	#	23	35	43
5	$	24	36	44
6	%	25	37	45
7	&	26	38	46
	. . . and so on, through:			
77	m	6D	109	155
78	n	6E	110	156
79	o	6F	111	157
80	p	70	112	160

Table 5.

Cursor Addressing Codes

ESC ?—Read Cursor Row/Column Position

<ESC><?> will send the Row and Column position of the cursor to the Host computer as the character string "<ESC><=> {Row} {Column} "—the format is identical with the format of Table 5, above.

ESC I-Back Tab

<ESC><I> will move the cursor left to the previous Tab Stop or unprotected field, if Write Protect Mode is ON. (<SHIFT><TAB> [Back Tab] issued the sequence <ESC><I>)

ESC i—Field Tab

<ESC><i> will move the cursor to the beginning of the next unprotected field on the screen.

The Freedom™ 100 lets you set protected fields (which can not be written into from the keyboard) as well as unprotected fields. This is especially useful in setting up screen 'forms" for data entry. <ESC><i> lets you move to the next unprotected field, without having to calculate its screen location.

ESC j—Reverse Line Feed

<ESC><j> will move the cursor up one row, without changing columns, or altering any character on the screen. If Scrolling in ON, <ESC><j> will cause the screen to scroll down 1 Row, if the Cursor is in Row 1 (top). (<SHIFT><ARROW> issues the sequence <ESC><j>)

Display Control Commands

CTRL Z—Clear Unprotected to Insert Character

<CTRL Z> will clear all unprotected screen locations to the current Insert Character—this is an ASCII Space by default, but can be set to anything you like by using <ESC><e> {Insert Character} .

ESC $—Graphics Mode On

<ESC><$> will set the Graphics Mode to ON, so that the A through P keys will produce the 16 Special Graphics characters, and not letters on the screen. (See the Section on Special Graphics on Page 25).

ESC %—Graphics Mode OFF

<ESC><%> will turn Special Graphics Mode OFF. (Default=ON)

ESC &—Write Protect Mode ON

<ESC><&> will turn the Write Protect Mode ON. When Protect Mode is on, characters with the Write Protect Attribute set can not be written over. (See the discussion of Write Protect Mode on Page 29.)

ESC'—Write Protect Mode OFF

<ESC><'> will turn the Write Protect Mode OFF, and normal data or text entry can continue. (Default=ON)

ESC • {code} —Load Cursor Attribute

<ESC><.> code will set the Cursor Attribute, so that the cursor will be displayed in various ways. The codes are:

<0>=Cursor Not Displayed

<1>=Cursor is a Blinking Block

< 2 > = Cursor is a Steady Block
< 3 > = Cursor is a Blinking Underline
< 4 > = Cursor is a Steady Underline

ESC)—Begin Write Protection
< ESC > <) > will Begin Write Protect Mode; thereafter, any character displayed on the screen up to the next < ESC > < (> will be Write Protected, if Write Protect Mode has been turned ON by an < ESC > < & >.

ESC (—End Write Protections
< ESC > < (> will End Write Protect Mode, and characters on the screen up to the next < ESC > <) > will be unprotected, and can be written over. (Default = ON)

ESC *—Clear All to NULLs
< ESC > < * > will clear all character positions on the screen to the ASCII < NULL > character (00). This is used in some programs instead of the < Space > character to fill unused screen positions.

ESC + —Clear All Unprotected to the Insert Character
< ESC > < + > will clear all unprotected character positions to the ASCII < Space > character (20 Hex).

ESC ,—Clear All to Write Protected Blank
< ESC > < , > will clear all character positions to the ASCII Blank character with the Write Protect Attribute set. (Page 29)

ESC :—Clear All Unprotected to < NULL >
< ESC > < : > will clear all unprotected character positions to the ASCII < NULL > character (00).

ESC ;—Clear All Unprotected to the Insert Character
(This command is the same as < ESC > < + >.)

ESC b—Set Reverse Field
< ESC > < b > will change the screen display to dark characters on a light background.

ESC d—Set Normal Field
< ESC > < d > will set the screen display to the normal dark background with bright characters.

ESC c—Set Fixed Attribute
< ESC > < c > will fix the attribute of all displayed characters to that set by < ESC > < G > {code} . All characters will change simultaneously when the attribute is changed. This feature allows emulation of "dumb" terminals which have only 1 or 2 attributes.

ESC m—Set Attribute by Character
< ESC > < m > will cause the terminal to allow you to set the attribute of each character separately by using < ESC > < G > code . (Default = ON)

ESC G {code} —Set Display Attribute
< ESC > < G > prepares the Freedom™ 100 to set the Screen Display Attribute for the part of the screen which is to the Right and Below the cursor. The next character is the code which tells it which attribute to set.
The codes are:

Table 6.

Attribute Codes

HALF INTENSITY	FULL INTENSITY	
< @ >	< 0 >	= Normal (Bright characters on dark background) (DEFAULT)
< A >	< 1 >	= Blank (Characters not displayed)
< B >	< 2 >	= Blink (Characters blink)
< C >	< 3 >	= Blink Blank (Characters not displayed)
< D >	< 4 >	= Reverse (Dark characters on light background)
< E >	< 5 >	= Reverse Blank (Not displayed)
< F >	< 6 >	= Reverse Blink (Dark characters blink)
< G >	< 7 >	= Reverse Blink Blank (Not displayed)
< H >	< 8 >	= Underline (Bright characters, bright underline)
< I >	< 9 >	= Underline Blank (Not displayed)
< J >	< : >	= Underline Blink (Characters blink, underline steady)
< K >	< ; >	= Underline Blink Blank (Not displayed)
< L >	"<"	= Underline Reverse (Dark characters, dark underline)
< M >	< = >	= Underline Reverse Blank (Not displayed)
< N >	">"	= Underline Reverse Blink (Characters blink, underline steady)
< O >	< ? >	= Underline Reverse Blink Blank (Not displayed)

ESC H—Toggle Auto-Scroll
<ESC> <H> will turn ON auto-scrolling, if it is off, or turns it OFF if it is on. (Default=ON)

ESC p ⟨code⟩ —Set Write Protection Attribute
<ESC> <p> ⟨code⟩ specifies the Display Attribute for all subsequent Write Protected characters. The default value, if you do not change it is <@> . Half Intensity. The codes used are the same as the ones used to set Display Attributes. (See < ESC> <G>, above)

ESC T—Erase to EOL with Insert Character
<ESC> <T> will replace all the characters from the cursor to the end of the current line with the Insert Character. The Insert Character is normally an ASCII <Space>, but can be set to any character with <ESC> <e>⟨any single character⟩ .

ESC t—Erase to EOL with Nulls
<ESC><t>will replace all the characters from the cursor to the end of the current line with the ASCII NULL character (00).

ESC Y—Erase to EOP with Insert Character
<ESC> <Y> will replace all the characters from the cursor to the bottom of the screen with the Insert Character. The Insert Character is normally an ASCII <Space>, but can be set to any character with <ESC> <e> ⟨any single character⟩ .

ESC y—Erase to EOP with Nulls
<ESC><y> will replace all the characters from the cursor to the bottom of the screen with the ASCII NULL character (00)

Editing Commands

ESC E—Line Insert
<ESC> <E> will move all of the lines below the cursor down one line, leaving the cursor on a line consisting of Insert Characters. The bottom line of the screen will scroll off and be lost. The <LINE INS> key issues an <ESC> <E> .

ESC N—Set Page Edit
<ESC> <N> will cause the terminal to Insert and Delete Characters by moving the whole page left or right, and inserting and deleting characters at Row 24, Column 80 (bottom right corner). (See the discussion of Editing Modes on Page 28.)

ESC O—Set Line Edit
<ESC> <O> will cause the terminal to insert and delete characters only on the line where the cursor is. (See the discussion on Page 28.)

ESC Q—Character Insert
<ESC> <Q> will move all of the characters to the right of the cursor right one space, leaving the cursor on an Insert Character. Any character in Column 80 will be scrolled off the right side of the screen and lost. The <CHAR INS> key issues an <ESC> <Q> .

ESC R—Line Delete
<ESC> <R> will delete all of the characters on the line where the cursor is, and move all of the lines below the cursor up one line. The bottom line on the screen will consist of Inset Characters. The <LINE DEL> key issues an <ESC> <R> .

ESC W—Character Delete
<ESC> <W> will delete the character at the cursor position, moving all characters on the line left one column to fill the deleted space. A <Space> will be entered in Column 80. The <CHAR DEL> key issues an <ESC> <W> .

ESC k—Set Local Edit
<ESC> <k> will set the terminal to respond to the Editing Keys, but not send their character sequences to the Host computer.

ESC l—Set Conversational Edit
<ESC> <l> will set the terminal to send the Edit key character sequences to the Host computer for processing. (Default=ON)

ESC q—Set Insert Mode
<ESC> <q> will put the Freedom™ 100 in Insert Mode. All characters typed in at the keyboard will be entered on the screen, and characters already there will move right and down to make room for them.

ESC r—Clear Insert Mode
<ESC> <r> will clear Insert Mode, and return to Edit Mode, where characters sent from the keyboard or the Host computer overwrite characters already on the screen. (Default=ON)

Communication Control Commands

CTRL N—End XON/XOFF Software Handshaking
<CTRL N> will quit doing software handshaking with the Host computer by sending XON/XOFF signals. (See <CTRL O>)

CTRL O—Begin XON/XOFF Software Handshaking
<CTRL O> will begin doing software handshaking with the Host computer by sending XON/XOFF signals. (Default=ON)

XON/XOFF software handshaking is done by sending an ASCII <DC3> character (Hex 13) for XOFF to the Host computer when the terminal's internal character storage buffer is almost full. The Host computer must recognize the XOFF and stop sending characters over the

RS-232 line. When the Freedom™ 100's character buffer is almost empty, it tells the Host to start sending again by sending it an ASCII <DC1> character (Hex 11) for XON.

CTRL R—Enable Bidirectional Printer Port

< CTRL R > will connect the Printer Port in parallel with the Host Port, allowing the Host and the Printer to communciate directly. Characters sent from the Host or the Printer (which might be a KSR machine, for instance) will be displayed on the Freedom™ 100's CRT SCREEN.

CTRL T—Disable Bidirectional Printer Port

< CTRL T > will disconnect the Printer Port from the Host Port. (Default = ON)

ESC 0 {code} —Program SEND Function

ESC <0> {code} will program the SEND function, so that when you press the <ENTER> key in Block Mode to send data to the computer, it will use one of the formats described below for the transmission. The codes are:

< 4 > = Set to <ESC > < 4 > format
< 5 > = Set to <ESC > < 5 > format
< 6 > = Set to <ESC > < 6 > format
< 7 > = Set to <ESC > < 7 > format
< S > = Set to <ESC > < S > format
< s > = Set to < ESC> < s > format

ESC 4—Send a Line of Unprotected Characters

<ESC> <4> will send the Host computer all of the unprotected characters which are on the current line. (See the discussion of Block Mode on Page 28)

ESC 5—Send a Page of Unprotected Characters

<ESC> <5> will send the Host all of the unprotected characters on the screen.

ESC 6—Send a Line of Characters

< ESC > <6> will send the Host computer all of the characters on the current line.

ESC 7—Send a Page of Characters

<ESC><7>will send the Host computer all of the characters on the screen.

ESC D { code} —Set Communication Mode

<ESC> <D> { code} will set the Communication Mode. Possible modes are:

Local, in which the Freedom™ 100 does not communicate with the Host Computer—all changes and editing are done on the screen locally. The code for Local is < L >.

Full Duplex, in which the Freedom™ 100 communicates with the Host computer in Full Duplex mode. The code for Full Duplex is < F >.

Half, Duplex, in which the Freedom™ 100 communicates with the Host computer in Half Duplex mode. The code for Half Duplex is <H>.

(See the discussion of Transmission Modes on Page 38)

ESC S—Send a Message of Unprotected Characters

< ESC > < S > will send the Host computer all of the unprotected characters on the screen which are between an ASCII <STX> character (Hex 02) and an <ETX> character (Hex 03). If there is no <STX>, it will start from Row 1, Column 1 (top left corner), and if there is no <ETX> it will send all of the remaining characters on the page.

This feature lets the Host computer ask for only part of the data entered on a "form" drawn on the screen with Protected characters.

ESC s—Send a Message with all Characters

<ESC><s >will send the Host computer all of the characters on the screen, protected or unprotected, which are between an <STX> and an <ETX>. It works just like the < ESC > < S > command otherwise.

ESC bspw—Configure Main Port

<ESC>< | > { code} will set the baud rate, stop bits, parity and word length for the Main Interface Port on the back of the Monitor Assembly. The parameters are:

b = Baud Rate

<0> = 110
<1> = 300
<2> = 600
<3> = 1200
<4> = 2400
<5> = 4800
<6> = 9600
<7> = 19200

s = Stop Bits

<0> = 1 Stop Bit
<1> = 2 Stop Bits

p = Parity

<0> = No Parity (Parity Ignored)
<1> = Odd Parity, both Transmit and Recieve
<3> = Even Parity, both Transmit and Receive
<5> = Mark Parity, Transmit Parity Check Disabled
<7> = Space Parity, Transmit Parity Check Disabled

w = Word Length

<0> = 8 Bits
<1> = 7 Bits

ESC | bspw—Configure Auxiliary Port

<ESC>< | > {bspw} will set baud rate, stop bits, parity and wordlength for the Auxiliary (Printer) Interface Port on the back of the Monitor Assembly.

The "bspw" codes are the same as those for <ESC>< | > {bspw }, above.

APPENDICES

List of Control Codes—Alphabetical by Function

Function	Default Setting	Code	Page Number
Back Tab	—	ESC I	36
Begin XON/XOFF Handshake	ON	CTRL O	38
Begin Write Protection	—	ESC)	37
Bell	—	CTRL G	34
Bell OFF	—	ESC _	34
Bell ON	ON	ESC ^	34
Block Mode OFF	ON	ESC C	34
Block Mode ON	—	ESC B	34
Buffer Print OFF	ON	ESC a	34
Buffer Print ON	—	ESC`	34
Carriage Return	—	CTRL M	35
Character Delete	—	ESC W	38
Character Insert	—	ESC Q	38
Clear All TABs	—	ESC 3	36
Clear All to W.P. Space	—	ESC ,	37
Clear All to Nulls	—	ESC *	37
Clear Insert Mode	ON	ESC r	38
Clear Monitor Mode	ON	ESC X	35
Clear Monitor Mode	ON	ESC u	35
Clear TAB here	—	ESC 2	36
Clear Unprot to Ins. Char	—	CTRL-Z	36
Clear Unprot to Nulls	—	ESC :	37
Clear Unprot to Space	—	ESC ;	37
Clear Unprot to Space	—	ESC +	37
Configure Main Port	DIP	ESC{	39
Configure Aux. Port	DIP	ESC}	39
Cnversation Mode ON	ON	ESC C	34
Cursor Down (Down Arrow)	—	CTRL V	35
Cursor Left (Back Space)	—	CTRL H	35
Cursor Right (Right Arw)	—	CTRL L	35
Cursor Up (Up Arrow)	—	CTRL K	35
Disable BiDir Print Port	ON	CTRL T	39
Display Control Code	—	ESC F	34
Display Status Line	ON	ESC h	35
Display User Line	—	ESC g	34
Enable BiDir Print Port	—	CTRL R	39
End Write Protection	—	ESC (	37
End XON/XOFF Handshake	—	CTRL N	38
Erase EOL with Nulls	—	ESC t	38
Erase EOL Insert Char	—	ESC T	38
Erase EOP with Nulls	—	ESC y	39
Erase EOP Insert Char	—	ESC Y	38
Field Tab	—	ESC i	36
Graphics Mode OFF	ON	ESC %	36
Graphics Mode ON	—	ESC $	36
Home	—	CTRL ^	36
Keyclick OFF	DIP	ESC <	35
Keyclick ON	DIP	ESC >	34

Function	Default Setting	Code	Page Number
Line Delete	—	ESC R	38
Line Feed	—	CTRL J	35
Line Insert	—	ESC E	38
Load Cursor Attribute	DIP	ESC . n	36
Load Insert Character	Blank	ESC e n	34
Load User Line	—	ESC F c	34
Lock Keyboard	—	ESC #	34
Monitor Mode OFF	ON	ESC u	35
Monitor Mode OFF	—	ESC X	35
Monitor Mode ON	—	ESC U	35
Newline (CR & LF)	—	CTRL _	35
Print	—	ESC P	35
Program SEND Function	ESC 7	ESC 0 c	39
Random Cursor Addressing	—	ESC = n,n	36
Read Cursor R/C Position	—	ESC &	36
Reverse Line Feed	—	ESC j	36
Send Line All	—	ESC 6	39
Send Line Unprotected	—	ESC 4	39
Send Message All	—	ESC s	39
Send Message Unprotected	—	ESC S	39
Send Page All	—	ESC 7	39
Send Page Unprotected	—	ESC 5	39
Set Attribute by Char	ON	ESC m	37
Set Conversational Edit	ON	ESC I	38
Set Cursor Column Pos	—	ESC] n	35
Set Cursor Row Position	—	ESC [n	35
Set Display Attribute	0	ESC G n	37
Set Fixed Attributes	—	ESC c	38
Set Full Duplex Mode	DIP	ESC D F	39
Set Half Duplex Mode	DIP	ESC D H	39
Set Insert Mode	—	ESC q	38
Set Line Edit Mode	ON	ESC O	38
Set Local Edit	—	ESC k	38
Set Local Mode	—	ESC D L	39
Set Normal Video	DIP	ESC d	37
Set Page Edit Mode	—	ESC N	38
Set Reverse Video	DIP	ESC b	37
Set TAB here	—	ESC 1	36
Set Write Prot Attrib	H.I.	ESC p n	38
Simultaneous Print OFF	ON	ESC A	34
Simultaneous Print ON	—	ESC @	34
TAB	—	CTRL I	35
Toggle Auto-Scroll	DIP	ESC H	38
Write Protection OFF	ON	ESC '	37
Write Protection ON	—	ESC &	36
Unformatted Print	—	ESC L	35
Unlock Keyboard	ON	ESC "	34

List of Control Codes—Alphabetical by CTRL/ESC sequence

Code	Function	Default Setting	Page Number
CTRL G	Bell	—	34
CTRL H	Cursor Left (Back Space)	—	35
CTRL I	TAB	—	35
CTRL J	Line Feed	—	35
CTRL K	Cursor Up (Up Arrow)	—	35
CTRL L	Cursor Right (Right Arw)	—	35
CTRL M	Carriage Return	—	35
CTRL N	End XON/XOFF Handshake	—	38
CTRL O	Begin XON/XOFF Handshake	ON	38
CTRL R	Enable BiDir Print Port	—	39
CTRL T	Disable BiDir Print Port	ON	39
CTRL V	Cursor Down (Down Arrow)	—	35
CTRL Z	Clear Unprot to Ins Char	—	36
CTRL^	Home	—	35
CTRL _	Newline (CR & LF)	—	35
ESC "	Unlock Keyboard	ON	34
ESC #	Lock Keyboard	—	34
ESC $	Graphics Mode ON	—	36
ESC %	Graphics Mode OFF	ON	36
ESC &	Write Protection ON	—	36
ESC '	Write Protection OFF	ON	37
ESC (	End Write Protection	—	37
ESC)	Begin Write Protection	—	37
ESC *	Clear All to Nulls	—	36
ESC +	Clear Unprot to Space	—	37
ESC ,	Clear All to W.P. Space	—	37
ESC • {n}.	Load Cursor Attribute	DIP	36
ESC 0 {c}	Program Send Function	ESC 7	39
ESC 1	Set TAB here	—	36
ESC 2	Clear TAB here	—	35
ESC 3	Clear All TABS	—	36
ESC 4	Send Line Unprotected	—	39
ESC 5	Send Page Unprotected	—	39
ESC 6	Send Line All	—	39
ESC 7	Send Page All	—	39
ESC :	Clear Unprot to Nulls	—	37
ESC ;	Clear Unprot to Space	—	37
ESC <	Keyclick OFF	—	34
ESC = {n,n}	Random Cursor Addressing	—	36
ESC >	Keyclick ON	ON	34
ESC ?	Read Cursor R/C Position	—	36
ESC @	Simultaneous Print ON	—	34
ESC A	Simultaneous Print OFF	ON	34
ESC B	Block Mode ON	—	34
ESC C	Block Mode OFF	ON	34
ESC C	Conversation Mode ON	ON	34
ESC D F	Set Full Duplex Mode	DIP	39
ESC D H	Set Half Duplex Mode	DIP	39
ESC D L	Set Local Mode	—	39
ESC E	Line Insert	—	38
ESC F {c}	Display Control Code	—	34
ESC G {n}	Set Display Attribute	0	37
ESC H	Toggle Auto-Scroll	DIP	38
ESC I	Back Tab	—	36
ESC L	Unformatted Print	—	35
ESC N	Set Page Edit Mode	—	38
ESC O	Set Line Edit Mode	ON	38
ESC P	Print	—	35
ESC Q	Character Insert	—	38
ESC R	Line Delete	—	38
ESC S	Send Message Unprotected	—	39
ESC T	Erase EOL Insert Char	—	38
ESC U	Monitor Mode ON	—	35
ESC W	Character Delete	—	38
ESC X	Clear Monitor Mode	ON	35
ESC X	Monitor Mode OFF	ON	35
ESC Y	Erase EOP Insert Char	—	38
ESC [{n}	Set Cursor Row Position	—	35
ESC] {n}	Set Cursor Column Pos	—	36
ESC	Bell ON	ON	34
ESC _	Bell OFF	—	34
ESC `	Buffer Print ON	—	34
ESC a	Buffer Print OFF	ON	34
ESC b	Set Reverse Video	DIP	37
ESC c	Set Fixed Attributes	—	38
ESC d	Set Normal Video	DIP	37
ESC e {c}	Load Insert Character	Blank	34
ESC f {t}	Load User Line	—	34
ESC g	Display User Line	—	34
ESC h	Display Status Line	ON	35
ESC i	Field Tab	—	36
ESC j	Reverse Line Feed	—	36
ESC k	Set Local Edit	—	38
ESC l	Set Conversational Edit	ON	38
ESC m	Set Attribute by Char	ON	37
ESC p {n}	Set Write Prot Attrib	H.I.	38
ESC q	Set Insert Mode	—	38
ESC r	Clear Insert Mode	ON	38
ESC s	Send Message All	—	39
ESC t	Erase EOL with NUL1s	—	38
ESC u	Clear Monitor Mode	ON	35
ESC u	Monitor Mode OFF	ON	35
ESC y	Erase EOP with Nul1s	—	38
ESC { bspw	Configure Main Port	DIP	39
ESC | bspw	Configure Auxiliary Port	DIP	39

Emulated Codes

Function	Freedom 100	TeleVideo 910	Hazeltine 1420	ADDS 25	ADM3/5
Back Tab	ESC I	ESC I	ESC I	ESC I	ESC I
Begin XON/XOFF	CTRL O				
Begin Write Protect	ESC)				
Bell	CTRL G	CTRL G	CTRL G	CTRL G	CTRL G
Bell OFF	ESC _				
Bell ON	ESC ^				
Block Mode OFF	ESC C				
Block Mode ON	ESC B				
Buffer Print OFF	ESC a	CTRL T	ESC /	ESC 4	ESC A
Buffer Print ON	ESC '	CTRL R	ESC *	ESC 3	ESC @
Carriage Return	CTRL M	CTRL M	CTRL M	CTRL M	CTRL M
Character Delete	ESC W				
Character Insert	ESC Q				
Clear All TABs	ESC 3	ESC 3	ESC 3		ESC 3
Clear to W.P. Space	ESC ,				
Clear All to Nulls	ESC *	ESC *		ESC *	ESC *
Clear Insert Mode	ESC r				
Clear Monitor Mode	ESC X	CTRL 2	CTRL 2	CTRL 2	CTRL 2
Clear Monitor Mode	ESC u	ESC u/X			ESC u/X
Clear TAB here	ESC 2	ESC 2	ESC 2	ESC 2	ESC 2
Clr Unpr to Ins Chr	CTRL-Z				
Clr Unpr to Nulls	ESC :				
Clr Unpr to Space	ESC ;				
Clr Unpr to Space	ESC +				
Configure Main Port	ESC { bspw				
Configure Aux. Port	ESC } bspw				
Convers. Mode ON	ESC C				
Cursor Down	CTRL V	CTRL J	CTRL J	CTRL J	CTRL J
Cursor Left	CTRL H	CTRL H	CTRL H	CTRL H/U	CTRL H
Cursor Right	CTRL L	CTRL L	CTRL P	CTRL F	CTRL L
Cursor Up	CTRL K	CTRL K	ESC CTL L	CTRL Z	CTRL K
Disable BiDir Port	CTRL T	ESC A	ESC ?	CTRL T	CTRL O
Display CTRL Code	ESC F {c}	ESC F {c}		ESC Z {c}	ESC f {c}
Display Status Line	ESC h				
Display User Line	ESC g				
Enable BiDir Port	CTRL R	ESC @	ESC /	CTRL R	CTRL N
End Write Protect	ESC (				
End XON/XOFF	CTRL N				
Erase EOL w/ Null	ESC t				
Erase EOL Ins Chr	ESC T	ESC T	ESC O	ESC K	ESC T
Erase EOP w/ Null	ESC y	ESC *		ESC *	ESC *
Erase EOP Ins Chr	ESC Y	ESC Y	ESC X	ESC k	ESC Y
Field Tab	ESC i				
Graphics Mode OFF	ESC %				
Graphics Mode ON	ESC $				
Home	CTRL^	CTRL^	ESC^ R	CTRL A	CTRL^
Keyclick OFF	ESC<				
Keyclick ON	ESC>				
Line Delete	ESC R				
Line Feed	CTRL J	CTRL J	CTRL J	CTRL J	CTRL J
Line Insert	ESC E				
Load Cursor Attrib	ESC . {n}	ESC .		ESC .	ESC.
Load Insert Char	ESC e {c}				
Load User Line	ESC f {t}				
Lock Keyboard	ESC #	ESC #	ESC U	ESC 5	ESC #
Monitor Mode OFF	ESC u	ESC u/X			ESC u/X
Monitor Mode OFF	ESC X	CTRL 2	CTRL 2	CTRL 2	CTRL 2
Monitor Mode ON	ESC U	ESC U			ESC U
Monitor Mode ON	CTRL 1	CTRL 1	CTRL 1	CTRL 1	CTRL 1
Newline (CR & LF)	CTRL _	CTRL _		CTRL _	CTRL _
Print	ESC P				
Program SEND Funct	ESC 0 {c}				
Random Cursor Addr	ESC = {n,n}	ESC=RC	ESC^ Q CR	ESC Y RC	ESC=RC
Read Cursor Pos	ESC ?	ESC ?	ESC^ E	ESC ?	ESC ?
Reverse Line Fee	ESC j				
Send Line All	ESC 6				
Send Line Unprotect	ESC 4				
Send Message All	ESC s				
Send Msg Unprotect	ESC S				
Send Page All	ESC 7				
Send Page Unprotect	ESC 5				
Set Attrib. by Char	ESC m				
Set Convers. Edit	ESC 1				
Set Cursor Col Posn	ESC] {n}	ESC] C		CTRL P C	ESC] C
Set Cursor Row Posn	ESC [{n}	ESC [R		CTRL K R	ESC [R
Set Display Attrib	ESC G {n}	ESC G {n}	ESC^ G n	ESC G	
Set Fixed Attribute	ESC c				
Set Full Duplex	ESC D F				
Set Half Duplex	ESC D H				
Set Insert Mode	ESC q				
Set Line Edit	ESC O				
Set Local Edit	ESC k				
Set Local Mode	ESC D L				
Set Normal Video	ESC d	ESC G0	ESC ^ G0	ESC G0	ESC G
Set Page Edit Mode	ESC N				
Set Reverse Video	ESC b	ESC G4	ESC^ G4	ESC G4	ESC G
Set TAB at cursor	ESC 1	ESC 1	ESC 1	ESC 1	ESC 1
Set W.P. Attribute	ESC p {n}				
Simul Print OFF	ESC A	ESC ?	CTRL T	CTRL O	
Simul Print ON	ESC @	ESC @	ESC /	CTRL R	CTRL N
TAB	CTRL I	CTRL I	CTRL I/N	CTRL I	CTRL I
Toggle Auto-Scroll	ESC H	ESC H		ESC H	ESC H
Unformatted Protect OFF	ESC '				
Write Prot ON	ESC &				
Unlock Keyboard	ESC "	ESC "	ESC^ F	ESC 6	ESC "

FREEDOM™ 100 USER MANUAL
ERRATA

1. Pg. 20, 1st column, last paragraph: "shift" and "nonshift" functions are backwards, <SHIFT><LINE> will delete line; <LINE> will insert line.
2. Pg. 20, 2nd column, 2nd paragraph: "shift" and "nonshift" functions are backwards, <SHIFT><CHAR> will delete character; <CHAR> will insert character.
3. Pg. 24, 2nd column, 9th paragraph: should read "<N> puts it in Page Mode". Add "<o> puts it in Line Mode".
4. Pg. 25, 1st column, 2nd paragraph: should read "Pressing the <ESC> key, then pressing <#> will lock the keyboard, while <SHIFT> <ESC>" will unlock it.
5. Pg. 25. 1st column, 3rd paragraph: should read "The block on the Status Line which is just to the right of the Keyboard Lock block shows whether Write Protect fields or characters on the screen can be changed or not".
6. Pg. 25, 1st column, 4th paragraph: should be added "The block on the Status Line just to the right of the Protect Mode block shows whether the Freedom™ 100 is in Normal or Graphics mode. Normal is indicated by a light green background, and Graphics by the dark letters <GRPH>.
7. Pg. 25, 2nd column, 2nd paragraph: should read "Sending <ESC><%> will reset the Freedom™ 100 to Normal Mode.
8. Pg. 28, 2nd column: references to "<CR>" as end of message character should be deleted. End of message character is switch selectable (left dip switch – switches 4-5). It can be <NULL>, <EOT>, <ETX>, or <CR>.
9. Pg. 30, table 4: screen code for "null" should be "none".
10. Pg. 30: notes should be deleted.
11. Pg. 34, 2nd column, 8th paragraph: delete "CR" in title block. Should read "ESC F {code} –Display Control Code".
12. Pg. 36, 1st column, table 5: should read

				. . . and so on through:
78	m	6D	109	155
79	n	6E	110	156
80	o	6F	111	157

13. Pg. 36 and 37, starting at 2nd column, last paragraph: should read
    <ϕ> = Cursor is a Steady Block
    <1> = Cursor not displayed
    <2> = Cursor is a Blinking Block
    <3> = Cursor is a Blinking Underline
    delete
    <4> = Cursor is a Steady Underline
14. Pg. 37, 2nd column, 5th paragraph: should read "ESC c – Assign Attribute to Screen Position
    <ESC><c> will fix display attributes to particular screen positions. Thereafter, any character displayed at a given screen position will have the display attribute which has been assigned to that position. If text is scrolled, characters moving into a screen position will take on the display attribute assigned to that particular screen location."
15. Pg. 37, 2nd column, 6th paragraph: should read "ESC m – Assign Attribute to Character
    <ESC><m> will cause the Freedom™ 100 to assign the current display attribute to a particular character. As characters are moved on the screen, the display attribute moves with the character.
16. Pg, 39, 1st column, 4th paragraph: should read "ESC ϕ {p1} {p2} – Program Send Function
    ESC ϕ {p1} {p2} will program the SEND function, so that when you press the <ENTER> or <SHIFT><ENTER> key in Block Mode to send data to the computer, it will use one of the formats described below for the transmission. The codes are:
    p1 = <ϕ> for shift send key
    = <1> for normal send key
    p2 = <4> Set to<ESC><4> format
    = <5> Set to<ESC><5> format
    = <6> Set to<ESC><6> format
    = <7> Set to<ESC><7> format
    = <s> Set to<ESC><s> format
    = <S> Set to<ESC><S> format
17. Pg. 14, 2nd column, 12th paragraph: delete entire "FIELD REVERSE" paragraph.
18. Pg. 35, 2nd column, last paragraph: should read "will move the cursor up or down in the same column, to the position specified by the code."
19. Pg. 36, 1st column, 2nd paragraph: should read "will move the cursor to the position in the current row specified by the code."