

# How to use the WANG 2436WP WORKSTATION as a terminal on a Wang 2200 minicomputer system

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## CHAPTER 1 INTRODUCTION

These instructions describe the capabilities provided when a Wang 2436WP Terminal Workstation is used as a terminal on the Wang 2200 minicomputer system. General information is provided in this section and Appendix A. Other sections include information on installing the software, connecting the hardware, descriptions of the various terminal features with programming information (examples are in Wang BASIC-2), and a list of additional software that can be purchased. Several Appendixes summarize the terminal's characteristics, show examples of the character sets, and hardware information needed to set up the 2236MXD or 2236MXE terminal controllers in the Wang 2200 system.

The 2436WP Terminal is a single-user, multi-tasking workstation that has its own Wang proprietary operating system. It provides local word processing, printing, forms, and merge print capability. When connected to a Wang 2200 minicomputer system, it becomes a remote terminal with the same basic functionality as a Wang 2236DE/DW terminal.

Hardware features include an 8Mhz 80186 microprocessor with 512Kb of RAM memory for multiple tasks, and a built-in 360Kb floppy diskette drive for data storage. There are two RS232 serial interfaces. One port (port 'A') is used for the communications link between the terminal and the Wang 2200 system. The other port (port 'B') is used with a local printer. The local printer can be used from either the local terminal or from the Wang 2200 system. Hardware options include a second 360Kb floppy diskette drive, a 10Mb winchester disk, and various printers.

# Chapter 2

## Installing the Software

~~To use the 2436WP Workstation as a terminal on a 2200 system, you must first install the 2436WP Terminal Software. This procedure adds a new menu selection onto the Applications menu to allow you to run the 2436WP Terminal Software. The following procedure only needs to be done once.~~

Make sure that both the SYSTEM disk and the 2436WP Terminal Software installation disk DO NOT have a write-protect tab covering the write-protect slot.

1. Insert the 2436WP SYSTEM disk into the base unit disk drive. Turn on the terminal and fill in the Date and Time screen as described in Chapter 2 of the Wang 2436WP terminal *User's Guide*.
2. Press the space bar until "APPLICATION" is selected from the main menu. Press EXEC.
3. Press the space bar until "MAINTENANCE" is selected from the main menu. Press EXEC.
4. The system will then prompt to insert the MAINTENANCE disk. Remove the SYSTEM disk from the base unit drive and insert the MAINTENANCE disk. Press EXEC.
5. Select "Install Software" from the MAINTENANCE menu. Press EXEC.
6. The system will prompt to insert the SYSTEM disk in the base unit. Remove the MAINTENANCE disk and insert the SYSTEM disk in the base unit drive. Press EXEC.
7. The system will prompt to insert the NEW software disk in the base unit. Insert the 2436WP Terminal Software installation disk in the base unit and press EXEC.
8. The system will prompt with "You are about to install 2436WP Terminal", and also, "Do you want to add the software to a menu?". Press the space bar until "Add to Applications Menu" is highlighted. Press EXEC.

9. The system will then prompt for the NEXT new software disk, press CANCEL.
  10. The system will prompt to insert the SYSTEM disk in the base unit. Do so and press EXEC.
  11. The system will return to the MAINTENANCE menu.
  12. You must now reboot your terminal. Remove the diskette from the disk drive, turn the terminal OFF, and wait at least 5 seconds. Insert the 2436WP SYSTEM disk in the base unit drive. Turn the terminal ON again and fill in the Date and Time screen. The new selection "2436WP Terminal" will be on the Applications Menu.
- 
-

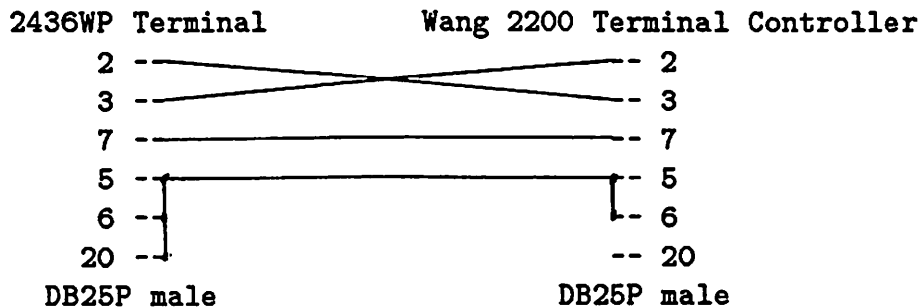
# Chapter 3

## Connecting the Hardware

Connecting the hardware involves proper setup of the Wang 2200 terminal controller as well as connecting a cable between the 2436WP Terminal Workstation and the Wang 2200 terminal controller. There are no hardware setups needed for the 2436WP Terminal.

The 2436WP Terminal will work with either the Wang 2236MXD or the Wang 2236MXE terminal controller. Proper setup for the 2236MXD is detailed in Appendix C; the 2236MXE is detailed in Appendix D. Both the terminal controller and the 2436WP Terminal must be set to the same data transmission rate. Baud rates may be 9600, 4800, 2400, 1200, 600, or 300 baud. The 2436WP Terminal Software defaults to 9600 baud, but may be explicitly changed through the SETUP menu (see Chapter 4).

The cables used by the 2436WP Terminal are the same as those for the Wang 2236DE/DW terminal. Wang part number 220-0447, or its equivalent, will work. If your cable should become damaged and need repair, here is a list of the required wiring:



Connect one end of the cable (possibly labeled 'MUX') to one of the four ports on the Wang 2200 terminal controller (2236MXD or 2236MXE). Make sure this port has the correct baud rate setting.

There are two RS232 ports on the back of the 2436WP Terminal base unit. The one closest to the fan (port B) is used for the local printer; it is marked with a printer icon. The other one (port A) is used for communications; it is marked with a communication icon. Connect the other end of the cable (possibly labeled 'TERMINAL') to the communications port (port A).

# Chapter 4

## Terminal Features and Programming

When the 2436WP Terminal is connected to a Wang 2200 minicomputer system, it becomes a remote terminal with the same basic functionality as a Wang 2236DE/DW terminal. This section describes the various features and gives programming examples using Wang BASIC-2 on the Wang 2200; a summary of the control codes is also given in Appendix B. These features and capabilities can be broken down into several areas:

- Screen display and character attributes.
- Graphics and character set.
- Keyboard layout and function keys.
- Printing.
- SETUP mode.
- Other features.

### 4.1 Screen display and character attributes

The 2436WP Terminal has a system status area plus a user character display area. The 1 row status area at the top of the screen is a system reserved area used to display the various tasks loaded into the terminal, the system date and time, and system messages to the user. This area is NOT available for the user to display messages of his choice. The user character display area is 24 rows by 80 columns. Characters in this region are displayed using either the Wang 2200 normal or alternate character sets (see Appendix B). Characters from either of the character sets may be displayed normally or with one or more display attributes such as bold, underscore, reverse video, or blink.



Examples of character set selection:

select normal character set	PRINT HEX(0202000E);
select alternate character set	PRINT HEX(0202020E);

Examples of character attributes:

select normal	PRINT HEX(020400000E);
select bold	PRINT HEX(020402000E);
select blink	PRINT HEX(020404000E);
select bold and blinking	PRINT HEX(02040B000E);
select reverse video	PRINT HEX(020400020E);
select underline	PRINT HEX(020400040E);
select reverse video and underline	PRINT HEX(0204000B0E);
select blinking and reverse video	PRINT HEX(020404020E);
select bold and underline	PRINT HEX(020402040E);

---

**NOTE:** A stand-alone HEX(OF) will turn off all attributes; a succeeding stand-alone HEX(OE) will turn them back on again. If the above hex sequences ended in HEX(OF) instead of HEX(OE), the character attributes would be cleared, and a succeeding HEX(OE) or HEX(OF) could be used to turn them on, or off again, respectively.

The screen display can also be cleared, with a cursor (looks like a bolded double underline) that can be set to either off, on, or blinking, and also can be moved up, down, left, right, or home.

Examples of cursor functions:

set cursor off	PRINT HEX(06);
set cursor on and non-blinking	PRINT HEX(05);
set cursor on and blinking	PRINT HEX(02050F);
move cursor to left margin	PRINT HEX(0D);
move cursor down	PRINT HEX(0A);
move cursor up	PRINT HEX(0C);
move cursor left (non-destructive)	PRINT HEX(08);
move cursor right (non-destructive)	PRINT HEX(09);
home cursor (top left corner of screen)	PRINT HEX(01);
clear screen and home cursor	PRINT HEX(03);
position cursor to row 3 column 50 and print an 'A'	PRINT AT(3,50);"A";

## 4.2 Graphics and character set

Both the normal and alternate character sets of the Wang 2200 are displayable on the screen with any combination of attributes. Limited graphics capability is provided by

using various combinations of the 'blob' graphics characters from the upper half of the alternate character set (see Appendix B); boxes may be drawn (or erased) around (or through) characters using the box draw commands of BASIC-2, or explicit HEX sequences.

Before giving the general form of the box draw HEX sequences, it is necessary to explain what is meant by upper and lower box graphic 'pens'. The upper pen appears to overline characters in the present cursor row; the lower pen appears to underline characters in the present cursor row. Actually, the lower pen is controlling the box graphic lines one row of characters below the cursor. The lower pen is necessary in order to draw a box around the entire page, while fooling the terminal into not scrolling the screen.

The general form of a box graphic sequence is:

```
PRINT HEX(O2OBssmm...OF);  
where:
```

---

ss - Starting pen position and draw/erase status  
00 - Lower pen, draw lines  
02 - Upper pen, draw lines  
04 - Lower pen, erase lines  
0B - Upper pen, erase lines

mm ... - zero or more 00, 08, 09, 0A, 0B, 0C 's  
00 - No movement  
08 - Move left  
09 - Move right  
0A - Move down  
0C - Move up  
0B - Swap pens and draw/erase vertical line while doing so

Examples of drawing boxes (using BOX command in BASIC-2):

```
draw a box 5 wide and 10 tall      PRINT BOX(10,5);  
enclose "abc" in a box            PRINT BOX(1,4);" abc ";
```

Examples of drawing boxes (using HEX sequences):

```
enclose "abc" in a box (same as previous example)  
PRINT HEX(O2OB02090909090B080808080B0F);" abc ";
```

### 4.3 Keyboard layout and function keys

Some keys on the 2436WP Terminal are not labeled in the same way as a real Wang 2236DE/DW terminal. This list should help:

2236DE/DW keystroke	2436WP keystroke
RESET	SHIFT-HELP
CONTINUE	HOME
HALT	SHIFT-HOME
RUN	EXEC
LOAD	SHIFT-EXEC
RECALL	BACKTAB
DECTAB	SHIFT-BACKTAB
EDIT	CANCEL
CANCEL	SHIFT-CANCEL
CLEAR	ALIGN (on the keypad)
local screen dump to printer	2nd-ALIGN (on the keypad)
toggle between A/A and A/a	CONTROL-HELP

---

**NOTE:** The function keys on a 2236DE/DW terminal are numbered 0 through 31; on the 2436WP Terminal they are numbered 1 through 32.

---

## 4.4 Printing


Local printers used on the 2436WP Terminal *require* that a custom printer driver be installed on the terminal. Your 2436WP Terminal Software comes pre-configured for the Wang PM015 daisy wheel printer. Printer drivers are already available for several Wang and non-Wang printers and typewriters (see the next section on Additional Software).

The Wang 2200 operating system release 2.6 and above allow the use of a table-driven Generalized Printer Driver (GPD). This is not required, but is desirable. Future releases of the Wang 2200 operating system will contain tables to support printers on the 2436WP Terminal. If no printer driver is used on the Wang 2200, the printer will perform like a generic /004 printer with only the control codes carriage return (CR), line feed (LF), and form feed (FF). Use of the GPD will allow changes in printer pitch and character attributes (bolding and underscore, etc.).

The characters that may be printed are only those characters common between the WISCII character set and the Wang 2200 character sets. No box graphics or blob graphics from the alternate character set will be printed. Screen dumps to the printer ignore any box graphics, but print a # for any blob graphics.

The printer on the 2436WP Terminal is a shared device; multiple tasks may want to use the printer at the same time. Tasks need to reserve exclusive use of the printer, use it, then return it so other tasks may use it. The printer must be explicitly OPENED (from the SETUP menu, described in the next section) before sending any print data to the printer or requesting screen dumps; any print data received before the printer

is OPENED is discarded. The printer must be explicitly ~~CLOSED~~ (also from the SETUP menu); this forces a page eject and makes the printer available for other tasks on the 2436WP Workstation.

 The local screen dump feature allows the user to obtain a copy of the CRT screen on the printer attached to the terminal. If a screen dump is activated while a Wang 2200 program is using the printer, the screen dump output will be printed on its own separate page, then printing will resume without missing any characters. The screen dump is invoked by pressing 2nd-ALIGN (on the keypad). The screen dump may be terminated by pressing CONTROL-HELP.

Examples of using printer:

OPEN printer	press HELP key to enter SETUP mode, then select OPEN printer
CLOSE the printer	press HELP key to enter SETUP mode, then select CLOSE printer
dump screen to printer	first OPEN the printer, then press 2nd-ALIGN (on the keypad)
abort a screen dump in progress	press CONTROL-HELP

to list a portion of a Wang 2200 BASIC-2 program:

first OPEN the printer, then type the following commands into the Wang 2200 BASIC-2:

SELECT LIST 004

LIST 100,200

SELECT LIST 005

then CLOSE the printer

## TERMINAL FEATURES AND PROGRAMMING

### 4.5 SETUP mode

Pressing the ~~HELP~~ key presents the SETUP menu. The SETUP menu provides a method for the user to make small changes in the way the 2436WP Terminal Software operates. The user may change the state of the keyboard upshift function, OPEN or CLOSE the printer, or modify the communication baud rate and parity. No screen or printer information should be lost while in SETUP mode.

The first item on the SETUP menu allows the user to set the state of the keyboard upshift function. The default setting is A/A. Selecting A/A shifts all lowercase characters (a-z only) to uppercase (A-Z); no other keyboard characters or functions are affected. Selecting A/a does not affect any characters. The user may toggle the state of the keyboard upshift function without using the SETUP menu by pressing CONTROL-HELP.

The next SETUP menu item selects whether the local terminal printer is OPEN or CLOSED. The default setting is CLOSED. The user must explicitly OPEN the printer before

sending any data to the printer or requesting local screen dumps; any print data received before the printer is OPENED is discarded. If another task on the 2436WP Terminal is already using the printer, the message "Printer is NOT AVAILABLE" is presented. The user may later wish to CLOSE the printer to force a page eject, or to make the printer available for other tasks on the workstation. The printer must be turned on and ONLINE to be OPENED. When the printer is being opened, the message "Attempting to OPEN the printer" is presented. This message should disappear within about 5 seconds.

The communications baud rate may be set to 9600, 4800, 2400, 1200, 600, or 300 baud. The parity can also be changed between none, odd, or even. The default is 9600 baud, odd parity. These changes are not 'sticky', that is, the user must make these changes every time he invokes the 2436WP Terminal Software. This is not a common problem; few users will need to change the baud rate or the parity from the defaults, but this feature is provided for those users with special applications that require it. When the baud rate or the parity is changed, the message "Closing and re-opening ASYNC driver" is presented.

Examples using printer escape sequences:

Reset printer to defaults      PRINT HEX(020DOC030F);  
Set to 6 lines per inch      PRINT HEX(020A0101060E);  
Set to 8 lines per inch      PRINT HEX(020A0101080E);  
Set to 10 characters per inch      PRINT HEX(020901020A000F);  
Set to 12 characters per inch      PRINT HEX(020901020C000F);  
Set to 15 characters per inch      PRINT HEX(020901020F000F);

More examples using printer escape sequences:

Enable auto line feed after carriage return      PRINT HEX(020A0E);  
Disable auto line feed after carriage return      PRINT HEX(020A0F);  
Set page length to 11 inches      PRINT HEX(020C020B0F);  
Set page length to 62 lines      PRINT HEX(020C0102003E0F);  
Select bolded print      PRINT HEX(02040000020E);  
Select underscored print      PRINT HEX(02040004000E);  
Clear all character attributes      PRINT HEX(0F);  
Enable previously selected character attributes      PRINT HEX(0E);  
Select character font #2      PRINT HEX(0202040F);  
Select character font #14      PRINT HEX(02021C0F);  
Tab to column 25      PRINT HEX(020501190F);  
Advance to top-of-form      PRINT HEX(0C);  
Set left margin at column 10      PRINT HEX(020B010A0F);  
Set no left margin      PRINT HEX(020B01010F);  
Print a cent sign (¢)      PRINT HEX(020D01017F);

NOTE: When the printer is OPENed from the SETUP menu, it is always reset to the power-on defaults. The defaults are 10 characters per inch, 6 lines per inch, no attributes enabled, form length of 11 inches, with auto line feed after carriage return enabled (/204 printer).

## 4.6 Other features

Miscellaneous features include smooth scrolling the screen, how to remove the 2436WP Terminal Software from memory, various new keystrokes, and other HEX sequences.

Smooth scroll allows the screen to smoothly scroll up (as opposed to jump scroll) whenever the screen would normally scroll. This is enabled/disabled by pressing CONTROL-S on the keyboard.

To completely remove the 2436WP Terminal Software from memory, press HELP to display the SETUP menu, then press SHIFT-CANCEL. The software will be removed from memory and the system will return to the Main System MENU. If the user should exit the software with the printer still OPEN, it will be automatically CLOSED.

There are several keystrokes new to the 2436WP Terminal:

<i>Character/Function</i>	<i>Keystroke</i>
vertical bar	2nd-SHIFT-1
° degree sign	2nd-SHIFT-2
£ pound sterling	2nd-SHIFT-4
¢ cent sign	2nd-SHIFT-6
§ section symbol	2nd-s or 2nd-SHIFT-S
¶ paragraph symbol	2nd-p or 2nd-SHIFT-P
\ backslash	2nd- /
toggle smooth scroll ON/OFF	CONTROL-S
enter SETUP mode	HELP

The terminal will beep when you PRINT HEX(07).

Reinitialize the terminal to the power-up state with PRINT HEX(020DOC030F).

The sequence HEX(0208090F) causes the terminal to transmit the terminal self-identification message. The message is sent from the terminal to the Wang 2200 in a form similar to:

```
*2436WP R20 9600BPS 8+0 (USA)
```

where:

```
*2436WP = the model number, preceded by an asterisk  
R20     = the revision number of the 2436WP Terminal Software  
9600BPS = the data rate, followed by BPS  
8+0    = data bits (7 or 8) and parity (E=even, O=odd, or N=none)  
(USA)  = version of keyboard and character set, in parentheses
```

The recommended procedure for obtaining the self-identification message from a terminal is to use the INPUT statement:

```
10 PRINT "WHAT KIND OF TERMINAL DO YOU HAVE (Default = 2236D)?"  
20 M$ = "2236D" : INPUT HEX(0208090F), M$
```

To enter an underscored character, press the underscore key (nothing will display), then press the character. The underscored character will be displayed and sent to the Wang 2200 system.

## 4.7 Additional Software

Additional software packages are available to run on the 2436WP Terminal. These include: Spelling Checker for word processing documents; MultiPlan for electronic spreadsheets; and PFS:FILE&REPORT for databases. Consult with your Wang representative concerning the availability, pricing, ordering, or additional information on these products.

A local printer may be attached to the 2436WP Terminal. The appropriate printer driver is required for proper operation of the printer. Your 2436WP Terminal Software comes pre-configured for the Wang PM015 daisy wheel printer. Printer Drivers for non-Wang printers are available at additional cost through the Wang Supplies Catalog or from the MCS Group. This is a list of the currently available printer drivers for the Wang 2436WP Terminal:

<i>Printers</i>	Brother HR35 C.Itoh/TEC A10-30 HP LaserJet / HP LaserJet+ * IBM Wheelprinter (model 5216) * IBM Quietwriter (model 5201) NEC 3510 Spinwriter Qume Sprint 11/40, 11/55, Letterpro 20 Wang PM012 Wang PM015
<i>Typewriters</i>	Canon AP550 Diablo 630 KSR * IBM Wheelwriter 3 & 5 * IBM Quietwriter 7 Panasonic KX-E708 * Swintec 1186CMP

**NOTE:** Printer drivers normally require a printer with a serial interface. Those drivers marked with an asterisk (\*) require the Wang Serial-to-Parallel converter. Drivers come packaged with a diskette, documentation, and appropriate cabling.

Additional printer drivers are made available from time-to-time. For the latest information on availability, pricing, or ordering of printer driver products, contact the MCS Group (605-341-6755).

## Chapter 5

# The 2436WP Archive System

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The 2436WP Archive System allows documents and other files created on the 2436WP Terminal to be stored on the 2200 computer disks and retrieved as needed. This makes it possible for the 2200 to serve as a central repository for documents, which may be shared among users, or simply stored until needed. The archive system also includes utilities for converting documents created with D.A.T.A. 3500™ or Wang 2200 Word Processing into 2436WP format, so that these documents can be edited on the 2436WP terminal.

### 5.1 Installing the 2436WP Archive System

The Archive System is supplied on a 2200 diskette and must be loaded on the 2200 before use. To do this, you must know the disk address of the diskette drive, and the address of the main disk on which the programs are stored. In most cases, the main disk is 310 and the diskette drive is B10, but this is not always the case.

Enter the 2200 terminal mode. Place the distribution diskette in the 2200 diskette drive and type the following command, but replace the address B10 with the correct address for the diskette drive if necessary:

```
LOAD RUN T/B10, "ARCHINST"
```

Press the RETURN key. This program will ask for the disk address of the distribution diskette, and the disk address of the disk where the programs are to be stored. When these addresses have been entered, the program will copy the required files to the main disk.

The archive system also requires the 2200 system utility @MENU, which is supplied with the 2200 Operating System.



The program is now invoked by running the program ARCHIVE, or by modifying the system menu file @SYSMVPB to call the archive menu ARCHMENU. To do the latter, perform the following steps:

1. Hold the SHIFT key down and press the HELP key. This should clear the screen.
2. Type the command LOAD RUN and press the RETURN key. This should bring up the system menu. If it doesn't, the system has been modified in some way. Do not proceed, but consult with whoever is responsible for software maintenance on the computer.
3. Hold the SHIFT key down and press the HELP key. This should clear the screen.
4. Type the command:

LIST 9000,

---

and press the RETURN key. Note that the comma after the numbers is part of the command and must be included. This should produce several lines of program text on the screen, each beginning with a 4 digit line number. The lines of the menu should appear in quote marks.

5. Choose a new line number which falls between two of the existing line numbers on the screen. It must be larger than the numbers on the first two lines and smaller than that of the last line. This determines where the new menu line will appear on the menu screen; they appear in line number order.
6. Type the following line of text, but replace the line number 9999 with the one you have chosen:  
9999 DATA "ARCHMENU", "2436WP Archive System", "M"  
Press the RETURN key. If the computer beeps and produces an error message, type the entire line again.
7. Again type the command LIST 9000, and press the RETURN key. The line you just typed should now appear with the others in the proper order. It should look like the others except for the different text. If it doesn't look right, go back and do steps 5 and 6 over.
8. When the list appears to be correct, hold the SHIFT key and press the SEARCH key. The program should display the message "Saving Node Data".
9. Type the command RUN and press RETURN. After a moment the system menu should appear with your new line in place.
10. Choose the new item and press EXEC. The Archive menu should appear after a moment. If it doesn't, review the above steps carefully, or consult with a 2200 programming expert.

**NOTE:** The Archive System programs require a 2200 partition of 8K or larger to operate (this is a very small amount of memory). The document conversion programs require partitions of 27K or larger. Only an 8K partition need be assigned to a 2436WP terminal which will be used only with the Archive System.

## 5.2 Creating Archives

Archives are 2200 data files which contain stored 2436WP files. There may be many archives on the 2200, and each archive can hold many 2436WP files. These files will normally be Word Processing documents, but other kinds of data may be archived as well. Files may be added to an archive at any time, retrieved whenever needed, and deleted when no longer required. When a file is deleted from an archive, the space it occupied will be re-used when a new file is added to the archive.

An archive may hold more than 1500 files, but having large numbers of files in a single archive may make it difficult to find the name of the particular file needed. It will normally be better to create several smaller archives, and keep different kinds of files in different archives.

Enter the 2200 terminal mode. Hold the SHIFT key and press the HELP key to clear the screen. If the System menu is used, type the command LOAD RUN and press the RETURN key. Select the 2436WP Archive System and press EXEC.

If the system menu is not used type:

```
LOAD RUN "ARCHIVE"
```

and press the RETURN key.

Archives are created by choosing the "Create a New Archive" item from the archive menu and pressing EXEC. The program asks for a name to give the archive (up to 8 characters) and the disk address on which it is to reside. Entering blanks or nothing into either of these fields will cause the program to exit back to the menu. Press RETURN to complete each entry.

The program then asks for the number of 'pages' to allow in the archive. A page is actually equivalent to 4000 characters, and is only an average value. Actual document pages may be longer or shorter than this, and the number of actual pages in the archive can vary. This simply gives an approximate value for the capacity of the archive. The number entered here is the *total* number of pages in the archive, not the number of pages per document.

Finally, the program asks for the maximum number of documents allowed in the archive. This establishes the capacity of the archive index and is independent of the number of pages. In some cases it may be necessary to allow for many pages per document, and

in other cases only a few pages per document may be necessary. This depends on the type of documents which will be placed in the archive.

The program provides an opportunity to review the entries for correctness, which is accepted by pressing EXEC. The archive will then be created, which may take a few minutes.

A typical archive file with approximately the same storage capacity as a 2436WP floppy diskette might have about 100 pages with 30 documents, each document containing about 3 pages.

### 5.3 Storing a Document in an Archive

---

To store a document into an archive, enter the 2200 terminal mode and go to the archive menu. Choose the function "Store a Document in an Archive" and press EXEC. Enter the name of the archive which is to receive the document, and the disk address on which it resides. Then enter the name for the document in the archive. This may be up to 32 characters long, and does not have to be the same as the name on the 2436WP diskette.

The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program, as will entering blanks or nothing in the first two fields.

The program will display the message "Waiting for Document". At this point, press the HELP key to enter the 2436WP SETUP mode.

Press RETURN 4 times, or BACKTAB twice to select "Document Transfer".

Use the SPACE-BAR or BACKSPACE key to select "Send a Document to the 2200", then press RETURN.

Type in the disk name and file name of the 2436WP document to be put into the 2200 archive file, or use the PREV and NEXT keys to scroll backward and forward through the file names. Then press EXEC.

The file transfer begins and displays a status message indicating the percentage complete. When the transfer is complete, press EXEC to return to 2200 terminal mode.

If an excessive number of errors occur during transfer, the document will not be stored. This indicates a bad connection between the 2436WP and the 2200.

Note that this program 'locks' the archive so that no one else may insert or delete documents from this archive until you exit the program. Retrieving documents from the archive and listing its contents is still possible. If you enter this program while someone else is storing or deleting documents from the archive, a message will be displayed noting the terminal number of the person using the archive. You may press

CANCEL to exit the program, or wait a few minutes and press RETURN, which causes the program to check again to see if the archive is available.

## 5.4 Retrieving a File from an Archive

To retrieve a document from an archive, enter the 2200 terminal mode and go to the archive menu. Choose the function "Retrieve a Document from an Archive" and press EXEC. Enter the name of the archive which contains the document, and the disk address on which it resides. Entering blanks for either of these fields will cause the program to terminate and return to the menu.

Then enter the name of the document in the archive. If a blank line is entered for the document name (just press RETURN without entering anything), the program will scan the archive index and display the name of the first document in the index. Pressing NEXT or PREV will scan forward or backwards through the index, displaying each name found. When the name of the desired document is displayed, press EXEC to accept it.

The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program, as will entering blanks or nothing in the first two fields.

The program will display the message "Ready to Send Document". At this point, press the HELP key to enter the 2436WP SETUP mode.

Press RETURN 4 times, or BACKTAB twice to select "Document Transfer".

Use the SPACE-BAR or BACKSPACE key to select "Receive a Document from the 2200", then press RETURN.

Type in the disk name and file name of the document as it is to appear on the 2436WP diskette file, then press EXEC.

The transfer begins and displays a status message indicating the percentage complete. When the transfer is complete, press EXEC to return to 2200 terminal mode.

If an excessive number of errors occur during transfer, the document will not be stored. This indicates a bad connection between the 2436WP and the 2200.

## 5.5 Listing the Contents of an Archive

To list the documents currently contained in an archive, enter the 2200 terminal mode and go to the archive menu. Choose the function "List the Contents of an Archive" and press EXEC. Enter the name of the archive to be listed, and the disk address on which it resides. Entering blanks or nothing into either of these fields will cause the program to terminate and return to the menu.

The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program.

The program will list some statistics about the archive at the bottom of the screen. This indicates the number of documents and pages currently used in the archive and the number available for new documents. You can exit the program at this point by pressing CANCEL. If you press EXEC instead, the documents in the archive will be listed by name. The date on which the document was entered in the archive is also displayed, but this will be correct only if the 2200 has a clock and the date has been entered from the DATE/TIME option on the system menu.

## 5.6 Deleting a Document from an Archive

Documents can be deleted from an archive any time they are no longer useful. When a document is deleted, the space it occupied in the archive can be re-used for new documents.

To delete a document, enter the 2200 terminal mode and go to the archive menu. Choose the function "Delete a Document from an Archive" and press EXEC. Enter the name of the archive which contains the document, and the disk address on which it resides. Entering blanks or nothing into either of these fields will cause the program to terminate and return to the menu.

Then enter the name of the document in the archive. If a blank line is entered for the document name (just press RETURN without entering anything), the program will scan the archive index and display the name of the first document in the index. Pressing NEXT or PREV will scan forward or backwards through the index, displaying each name found. When the name of the desired document is displayed, press EXEC to accept it.

The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program, as will entering blanks or nothing in the first two fields.

If you are certain you wish to delete this document press EXEC. The deletion operation will take a few seconds.

The program will then give you a choice to delete another document or CANCEL. If you press RETURN, the program will go through the archive name and disk fields again. Simply press RETURN to accept them as they are, or enter a new archive name if required.

Note that this program 'locks' the archive so that no one else may insert or delete documents from this archive until you exit the program. Retrieving documents from the archive and listing its contents is still possible. If you enter this program while someone else is storing or deleting documents from the archive, a message will be

displayed noting the terminal number of the person using the archive. You may press **CANCEL** to exit the program, or wait a few minutes and press **RETURN**, which causes the program to check again to see if the archive is available.

## 5.7 Converting a D.A.T.A. 3500 Document

Documents created by the DATA 3500 Word Processor, (a product and trademark of The Office Manager, Inc.), can be converted to 2436WP format for further processing. The document is taken directly from a DATA 3500 Volume and placed in a 2436WP Archive. The archived document can then be moved to the 2436WP disk using the "Retrieve a Document from an Archive" option.

The following restrictions apply to the conversion:

- **CODE DEC-TAB** and the **CODE CENTER** commands are not implemented and are ignored.
- The only **PRINTER-CONTROL** command implemented is page numbering in headers and footers. All others are ignored.
- Glossary operations are not implemented, and are ignored.
- Merge graphics remain in the text as they appear, but are not functional. The 2436WP does merges differently and the document must be revised to make the merges work.
- Alternating and sequenced headers and footers are not implemented. Only the first header or footer page is used.
- There is a limit of 120 lines following any given format line. The current page is terminated if this limit is exceeded.
- There is a limit of 125 pages in a document. Conversion is terminated if this limit is exceeded.
- The linespacing code in the format line is not implemented in this version of the program.

To convert a document, enter the 2200 terminal mode and go to the archive menu. Choose the function "Convert a DATA 3500 Document" and press **EXEC**. Enter the name of the DATA 3500 Volume which contains the document, and the disk address on which it resides. Then enter the name of the document in the volume. The actual number of pages in the document will be displayed.

Then enter the name of the archive which is to receive the converted document, and the disk address on which it resides. Enter the name of the document in the archive. This may be up to 32 characters in length, and does not have to be the same as the DATA 3500 name. The name defaults to the same name, however.

The approximate number of pages available in the archive will be displayed. Note that this does not correspond exactly with DATA 3500 pages. 2436WP documents are generally somewhat longer than DATA 3500 documents, so some additional pages should be available.

If a header is present in the source document, the program will ask for the page number of the first page which is to have a header. If a footer is present it will also ask for the page number of the first page to have the footer, and the page line on which the footer is to begin. Make certain that the first footer line is past any text lines in the document.

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The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program, as will entering blanks or nothing in the first two fields.

Once started the conversion is automatic and requires 20 to 30 seconds for each full page. The page being processed is displayed at the bottom of the screen.

When the conversion is complete, the document can be retrieved from the archive and edited on the 2436WP Word Processor.

Note that this program 'locks' the archive so that no one else may insert or delete documents from this archive until you exit the program. Retrieving documents from the archive and listing its contents is still possible. If you enter this program while someone else is storing or deleting documents from the archive, a message will be displayed noting the terminal number of the person using the archive. You may press CANCEL to exit the program, or wait a few minutes and press RETURN, which causes the program to check again to see if the archive is available.

## 5.8 Converting a Wang 2200WP Document

Documents created by the Wang 2200 Word Processor can be converted to 2436WP format for further processing. The document is taken directly from a 2200WP Volume and placed in a 2436WP Archive. The archived document can then be moved to the 2436WP disk using the "Retrieve a Document from an Archive" option.

The following restrictions apply to the conversion:

- Merge graphics are ignored. The 2436WP does merges differently and the document must be revised to make the merges work.

- There is a limit of 120 lines following any given format line. The current page is terminated if this limit is exceeded.
- The linespacing code in the format line is not implemented in this version of the program.

To convert a document, enter the 2200 terminal mode and go to the archive menu. Choose the function "Convert a Wang 2200 WP Document" and press EXEC. Enter the name of the 2200WP Volume which contains the document, and the disk address on which it resides. Then enter the document number and library code. The title of the document will be displayed.

Then enter the name of the archive which is to receive the converted document, and the disk address on which it resides. Enter the name of the document in the archive. This may be up to 32 characters in length. The name defaults to the 2200WP title.

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~~The approximate number of pages available in the archive will be displayed. Note~~ that this does not correspond exactly with 2200WP pages. 2436WP documents are generally somewhat longer than 2200WP documents, so some additional pages should be available.

If a header is present in the source document, the program will ask for the page number of the first page which is to have a header. If a footer is present it will also ask for the page number of the first page to have the footer, and the page line on which the footer is to begin. Make certain that the first footer line is past any text lines in the document.

The program will give you an opportunity to review the information for correctness. Accept it by pressing EXEC or press RETURN to go through the entries again. CANCEL will terminate the program, as will entering blanks or nothing in the first two fields.

Once started the conversion is automatic and requires 20 to 30 seconds for each full page. The page being processed is displayed at the bottom of the screen.

When the conversion is complete, the document can be retrieved from the archive and edited on the 2436WP Word Processor.

Note that this program 'locks' the archive so that no one else may insert or delete documents from this archive until you exit the program. Retrieving documents from the archive and listing its contents is still possible. If you enter this program while someone else is storing or deleting documents from the archive, a message will be displayed noting the terminal number of the person using the archive. You may press CANCEL to exit the program, or wait a few minutes and press RETURN, which causes the program to check again to see if the archive is available.



# Appendix A

## 2436WP Terminal Specifications (when used as a 2200 terminal)

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### CRT

24 lines, 80 characters per line.

### Character Attributes

normal, bold, underscore, blink, reverse video, and box graphics, using the standard and/or alternate character set (as listed in Appendix B).

### Transmission Baud Rate Options

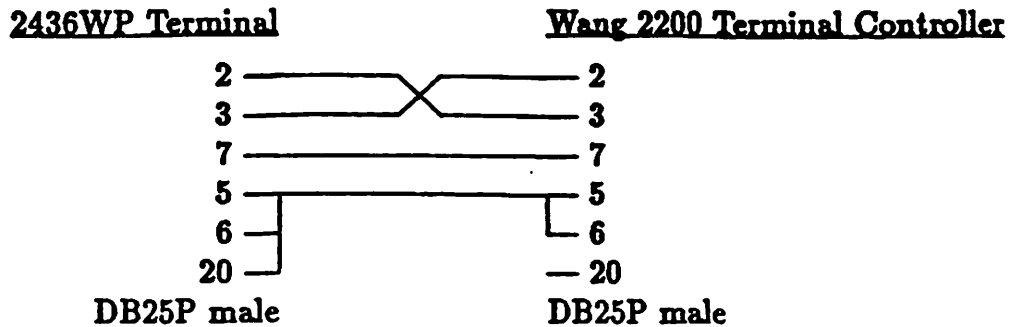
Manually selected at each terminal:  
9600, 4800, 2400, 1200, 600, or 300 baud.

### Character Format

When communicating with a 2200 system:  
8 data bits, 1 stop bit, odd parity (11 bits/char).  
Other selectable formats:  
8 data bits, 1 stop bit, no parity (10 bits/char).  
8 data bits, 1 stop bit, even parity (11 bits/char).

## Cabling Requirements

The cables used by the 2436WP Terminal are the same as those for the Wang 2236DE/DW terminal. Wang part number 220-0447, or its equivalent, will work. If your cable should become damaged and need repair, here is a list of the required wiring:



**NOTE:** Cable lengths over 50 feet may require high quality cable or a reduced baud rate for proper operation.

The communications port uses asynchronous serial RS-232 data through a female DB25S connector with the following pin assignments:

**Table A.1: Serial Port A Pin Assignments and Description**

Terminal	Pin	Description
1	FG	Frame Ground.
2	TD	Transmit Data. Output from terminal. Data from 2436WP terminal to 2200 computer.
3	RD	Receive Data. Input to terminal. Data from 2200 computer to 2436WP terminal.
4	RTS	Request To Send. Output from terminal. Active whenever terminal software is loaded.
5	CTS	Clear To Send. Input to terminal. Unused.
6	DSR	Data Set Ready. Input to terminal. Unused.
7	SG	Signal Ground.
8	DCD	Data Carrier Detect. Input to terminal. Unused.
20	DTR	Data Terminal Ready. Output of terminal. Active whenever terminal software is loaded.

**NOTE:** When the transmission baud rate or parity is changed from the SETUP menu, the handshake lines RTS and DTR temporarily go to the inactive state, then return to their active state.

# Appendix B

## Character Sets and Control Codes

Table B.1: 2200 Normal Character Set

	1xH	2xH	3xH	4xH	5xH	6xH	7xH	8xH	9xH	AxH	BxH	CxH	DxH	ExH	FxH
x0H	â		0	@	P	°	p		â	_	Q	@	P	°	p
x1H	ê	!	1	A	Q	a	q	◆	ê	!	1	A	Q	a	q
x2H	î	”	2	B	R	b	r	▶	î	”	2	B	R	b	r
x3H	ô	#	3	C	S	c	s	◀	ô	#	3	C	S	c	s
x4H	û	\$	4	D	T	d	t	→	û	\$	4	D	T	d	t
x5H	ä	%	5	E	U	e	u	_	ä	%	5	E	U	e	u
x6H	ë	&	6	F	V	f	v		ë	&	6	F	V	f	v
x7H	ï	'	7	G	W	g	w	˘	ï	'	7	G	W	g	w
x8H	ö	(	8	H	X	h	x	'	ö	(	8	H	X	h	x
x9H	ü	)	9	I	Y	i	y	`	ü	)	9	I	Y	i	y
xAH	à	*	:	J	Z	j	z	^	à	*	:	J	Z	j	z
xBH	è	+	;	K	[	k	§	■	è	±	;	K	[	k	§
xCH	ù	,	<	L	\	l	£	!!	ù	,	<	L	\	l	£
xDH	Ä	-	=	M		m	é	↑	Ä	=	≡	M		m	é
xEH	Ö	.	>	N	↑	n	ç	ß	Ö	.	>	N	↑	n	ç
xFH	Ü	/	?	O	←	o	¢	¶	Ü	/	?	O	←	o	¢

Table B.2: 2200 Alternate Character Set

	1xH	2xH	3xH	4xH	5xH	6xH	7xH	8xH	9xH	AxH	BxH	CxH	DxH	ExH	FxH
x0H	â		0	@	P	°	p		.						
x1H	ê	!	1	A	Q	a	q	◆	◇						
x2H	î	”	2	B	R	b	r	▶	▲						
x3H	ô	#	3	C	S	c	s	◀	▼						
x4H	û	\$	4	D	T	d	t	→	↓						
x5H	ä	%	5	E	U	e	u	┌	┐						
x6H	ë	&	6	F	V	f	v		√						
x7H	ï	'	7	G	W	g	w	¨	°						
x8H	ö	(	8	H	X	h	x	'	{						
x9H	ü	)	9	I	Y	i	y	`	}						
xAH	à	*	:	J	Z	j	z	^	△						
xBH	è	+	;	K		k	§	■	□						
xCH	ù	,	<	L	\	l	£	!!							
xDH	Ä	-	=	M		m	é	↑							
xEH	Ö	.	>	N	↑	n	ç	ß							
xFH	Ü	/	?	O	←	o	¢	¶							

Table B.3: WISCII Character Set

	2xH	3xH	4xH	5xH	6xH	7xH	8xH	9xH	AxH	BxH	CxH	DxH	ExH	FxH
x0H		0	@	P	'	p	°	Â	â	Ĝ	ğ	þ	þ	£
x1H	!	1	A	Q	a	q	◆	À	à	Ŭ	ŭ	Ð	ð	f
x2H	"	2	B	R	b	r	▶	Á	á	İ	ı	Ý	ý	¥
x3H	#	3	C	S	c	s	◀	Ä	ä	Î	î	Ş	ş	¼
x4H	\$	4	D	T	d	t	→	Å	å	Ì	ì	'	'	½
x5H	%	5	E	U	e	u	←	←	→	Í	í	Û	û	¾
x6H	&	6	F	V	f	v		Å	å	Ī	ī	Û	û	ˆ
x7H	'	7	G	W	g	w	■	↓	†	LL	H	Ú	ú	'
x8H	(	8	H	X	h	x	!!	Æ	æ	Ñ	ñ	Û	ü	'
x9H	)	9	I	Y	i	y	↑	Ç	ç	Ô	ô	©	™	"
xAH	*	:	J	Z	j	z	↓	†	□	Ò	ò	®	Ω	"
xBH	+	;	K	[	k	{	↑	•	␣ no space	Ó	ó	Ŕ	↔	,
xCH	,	<	L	\	l		←	Ê	ê	Ï	ï	•	•	'
xDH	-	=	M	]	m	}	±	È	è	Ï	õ	<	>	'
xEH	.	>	N	↑	n	-	ı	É	é	Œ	œ	§	ß	5 unit space
xFH	/	?	O	_	o	¢	ı	Ë	ë	Ø	ø	¶	•	dead key

Table B.4: Single-byte CRT Control Codes

HEX	ACTION
00	Null
01	Moves cursor to the home position (top left corner of the CRT)
02	Start of multi-byte sequence
03	Clears the screen and homes the cursor
04	Reserved
05	Cursor on and non-blinking
06	Cursor off
07	Beep
08	Moves cursor 1 space left (non-destructive)
09	Moves cursor 1 space right (non-destructive)
0A	Moves cursor 1 line down (line feed)
0B	Reserved
0C	Moves cursor 1 line up (reverse line feed)
0D	Moves cursor to left margin (carriage return)
0E	Activates character attributes
0F	Clears character attributes

Table B.5: Multi-byte CRT Control Codes

HEX Sequence	ACTION
0202000E	Select normal character set
0202020E	Select alternate character set
02050F	Cursor on and blinking
0208090F	Request terminal self-identification message
020D0C030F	Reinitializes terminal to power on state
0204xxyy0E	Select attributes and turn them on
0204xxyy0F	Select attributes and turn them off

where *xx yy* are the HEX codes for the display attributes:

- xx* = 00 - no bold, no blink
- 02 - bold, no blink
- 04 - no bold, blinking
- 0B - bold, blinking
- yy* = 00 - normal video, no underline
- 02 - reverse video, no underline
- 04 - normal video, underline
- 0B - reverse video, underline

The general form of a box graphic sequence is:

**PRINT HEX(020Bssmm...0F);**

where:

- ss* - Starting pen position and draw/erase status
  - 00 - Lower pen, draw lines
  - 02 - Upper pen, draw lines
  - 04 - Lower pen, erase lines
  - 0B - Upper pen, erase lines
- mm ...* - zero or more 00, 08, 09, 0A, 0B, or 0C
  - 00 - No movement
  - 08 - Move left
  - 09 - Move right
  - 0A - Move down
  - 0C - Move up
  - 0B - Swap pens and draw/erase vertical line while doing so

## 2436WP Terminal Printer Standard Control Sequences

<u>HEX code</u>	<u>Action</u>
00	Null. This code is not sent to the printer.
01	Null. This code is not sent to the printer.
02	<b>Initiate Escape Code Sequence.</b> This is the first byte of all printer escape code sequences.
03	Null. This code is not sent to the printer.
04	Null. This code is not sent to the printer.
05	Null. This code is not sent to the printer.
06	Null. This code is not sent to the printer.
07	Null. This code is not sent to the printer.
08	<b>Non-destructive Backspace.</b> The printhead is moved back the width of a space in the current pitch. The printhead will move to the left of the left margin to the limits of the carriage.
09	<b>Horizontal Tab.</b> Causes the printhead to move to the next tab stop. Tab stops are located every 5 columns. The width of 5 columns changes with changes in horizontal pitch.
0A	<b>Line Feed.</b> Advances the paper to the next line. The line feed increment is the currently selected size. A carriage return is not performed.
0B	<b>Vertical Tab.</b> Advances the paper to the next vertical tab stop. Vertical tabs are assumed to be located every 6 lines from the top-of-form. If the vertical tab crosses the end-of-form, a form feed is generated instead. The height of 6 lines changes with changes in the vertical line spacing. A carriage return is not performed.
0C	<b>Form Feed.</b> Advances the paper to the next top-of-form. A carriage return is not performed.
0D	<b>Carriage Return.</b> The printhead is moved to the left margin. If Auto Line Feed After Carriage Return is enabled, the paper will be advanced to the next line.
0E	<b>Enable Character Attributes.</b> Turn on previously selected character attributes (see escape code sequences). Attributes enabled in this way are cleared by a carriage return, reset, or HEX(0F).
0F	<b>Clear Character Attributes.</b> Turn off all character attributes.
7F	<b>Clear Buffer.</b> Restore printer to power-on defaults of 10 pitch, 6 lines per inch, no character attributes, and a form length of 11 inches. If the printhead is not already at top-of-form, a form feed is generated.



## 2436WP Terminal Printer Standard Escape Sequences

Escape Sequence	Action
02 01 02 01 00 OF	— Start Built-in Diagnostics. This sequence is not supported and is ignored.
02 02 xx OF	— Select Character Font. The new font will remain in effect until a new Select Font or Reset Defaults sequence is received. An illegal font number will select the default font.
xx = 00	— font #0 (default)
02	— font #1
04	— font #2
06	— font #3
	⋮
1E	— font #15
20	— font #16
02 03 OF	— Clear Platen. Does a carriage return and a form feed.
02 04 ww xx yy zz	— Define Isolated HEX(OE). This sequence defines the meaning of an isolated HEX(OE). If this definition is ended with an OE the attributes are turned on immediately; if it is terminated with an OF the attributes are selected but not turned on until an isolated HEX(OE) is received. The character attributes selected with an isolated HEX(OE) will be cleared upon receiving an isolated HEX(OE), carriage return, or reset.
ww = 00	— overstrike (strikethrough) disabled
02	— overstrike (strikethrough) enabled
xx = 00	— underscore disabled
04	— underscore enabled
yy = 00	— emphasized print (bold) disabled
02	— emphasized print (bold) enabled
zz = OE	— turn on attributes until reset or a HEX(OE) is received
OF	— turn off all attributes; turn on attributes upon receipt of an isolated HEX(OE); turn off on an isolated HEX(OE), carriage return, or reset
02 05 01 xx OF	— Horizontal Tab to Column xx. The printhead will move to column xx even if it is already past it.
xx =	hexadecimal value of column number    01 ≤ xx ≤ FF

## 2436WP Terminal Printer Standard Escape Sequences

<u>Escape Sequence</u>	<u>Action</u>
02 05 02 <i>xx yy</i> 0F	<p>— Horizontal Tab <i>xx</i> Inches and <i>yy</i> Quarter Inches. The printhead is moved relative to the current position. The number of quarter inches is limited to 3.</p> <p><i>xx</i> = hexadecimal number of inches</p> <p><i>yy</i> = hexadecimal number of quarter inches    <math>00 \leq yy \leq 03</math></p>
02 06 <i>xx</i> 0F	— Select Paper Tray. This sequence is not supported and is ignored.
02 07 0F	— Deselect Printer. This sequence waits for printing to complete, generates a form feed, then CLOSEs the 2436WP terminal printer.
02 08 01 0E	— Enable Superscript Mode. Succeeding characters are printed in the superscript position.
02 08 01 0F	— Disable Superscript Mode. Succeeding characters are printed at the normal character baseline position.
02 08 02 0E	— Enable Subscript Mode. Succeeding characters are printed in the subscript position.
02 08 02 0F	— Disable Subscript Mode. Succeeding characters are printed at the normal character baseline position.
02 08 03 0E	— Enable Underscore Mode. Succeeding characters, including spaces, are underscored.
02 08 03 0F	— Disable Underscore Mode. Succeeding characters are not underscored.
02 08 04 0E	— Enable Overstrike (Strikethrough) Mode. Succeeding characters, including spaces, are overstruck with the / character.
02 08 04 0F	— Disable Overstrike (Strikethrough) Mode. Succeeding characters are not overstruck.
02 09 01 02 <i>xx yy</i> 0F	<p>— Select Pitch. Sets the horizontal pitch to <i>xx</i> characters per inch. The default pitch is 10 characters per inch. Pitches supported are 5, 10, 12, and 15 (05, 0A, 0C, 0F respectively). Value of fractional pitch (<i>yy</i>) is ignored.</p> <p><i>xx</i> = hexadecimal value of the integral pitch    <math>05 \leq xx \leq 14</math></p> <p><i>yy</i> = hexadecimal value of the fractional pitch</p>



Handwritten scribbles or marks on the right edge of the page.

## 2436WP Terminal Printer Standard Escape Sequences

<u>Escape Sequence</u>	<u>Action</u>
02 0C 01 02 00 xx 0F	<b>— Set Form Length in Lines.</b> This sequence sets the length of the form. If the printhead is not at top-of-form, a form feed is executed before the form length is set. xx = hexadecimal value of number of lines per form $01 \leq xx \leq FF$
02 0C 02 xx 0F	<b>— Set Form Length in Inches.</b> This sequence sets the length of the form. If the printhead is not at top-of-form, a form feed is executed before the form length is set. The maximum form length is 16 inches. xx = hexadecimal value of length of form in inches $01 \leq xx \leq 10$
02 0D 01 xx yy ... yy	<b>— Enter Transparent Mode for xx Bytes.</b> This sequence is not fully supported. Only the sequence 02 0D 01 01 7F is recognized to print the cent sign graphic (¢). xx = number of bytes to pass to the printer yy ... yy = the bytes to be passed
02 0D 0C 03 0F	<b>— Restore Power-on Defaults.</b> This sequence causes all of the power on defaults of the printer to be reset to their original values. Any data in the buffer when this command is received is printed before the command is executed. The printer will default to 10 characters per inch, 6 lines per inch, no attributes enabled, form length of 11 inches, with auto line feed after carriage return enabled (/204 printer). If the printhead is not already at top-of-form, a form feed is executed before the defaults are set.

**NOTE:** When the printer is OPENed from the SETUP menu, it is always reset to the power-on defaults.