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WordStar® for the IBM PC™

Important Technical Information

Version 3.2

The power of WordStar is now at your command on the IBM Personal Computer. MicroPro International Corporation has provided you with the leading word processing program on up-to-the-minute microcomputer equipment. Your copy of WordStar, specially designed for use on the IBM Personal Computer, includes all the standard features that have made this program so popular. WordStar version 3.2 is designed to operate under IBM PC DOS™ versions 1.0 and 1.1.

Here are a few things you need to know about how to use WordStar on IBM that you won't find in the current WordStar manuals. As you make your way through the *WordStar Training Guide*, refer to this list. If you like, you can mark the changes in your Training Guide.

1. **How to Turn on the Computer.** In the *WordStar Training Guide* there is a section called "Starting Your Computer." Do not use these directions; read the section of your *IBM Disk Operating System* manual, "How to Start DOS." These procedures are outlined below:
 - To start the computer you simply insert the DOS diskette into drive A, turn the power on and enter today's date.
 - To reset the system at any time, you just press the DEL, CTRL, and ALT keys simultaneously.
 - Next, you should copy the WordStar files onto a blank disk (see the *IBM Disk Operating System* manual, "Copy Command").

The files you create as you perform exercises in the *Training Guide* belong on your work diskette in drive B. To get there you must change the logged disk drive. Each time you restart your computer you have to change the logged disk drive because the computer always starts you out on drive A. The *Training Guide* tells you how.

2. **Installing WordStar for your Printer.** If you are using a printer with WordStar that is not a teletype-like printer, you will need to run the installation program in order to match WordStar to your specific printer. Follow the instructions in the *Printer Installation for the IBM Personal Computer*.

3. **Naming Files.** In the *IBM Disk Operating System* manual, there is a list of reserved names that cannot be used by WordStar as file names because they have special meanings for DOS. They are:

CON
AUX
COM1
LPT1
PRN
NUL

4. **Ruler Line.** In the *WordStar Training Guide* there is a section called "Preliminary Adjustments." You are asked to change the margins so that the ruler line looks like this:

L----!----!----!----!----!----!----R

However, when you make the adjustments your ruler line will look like this:

!----!----!----!----!----!----!

That's fine. You can go ahead to the next section.

5. **Command Key Differences.** Several IBM Personal Computer command keys are different from those on many other microcomputers. See the key equivalent charts included in this package.

Example: In the *WordStar Training Guide*, in the section "Deleting to the Left," you are told to press CTRL Q Del to delete everything left of the cursor. You can press CTRL Q <- (and you must hold down the CTRL key while pressing the other two keys).

6. **Print Effects.** There are a number of WordStar print features that will *not* work on some printers. For example:
- If you have a teletype-like printer, such as the EPSON MX 80, you will not get boldfacing (^PB) but instead get double-striking. You also will not be able to vary line height (with .LH) or character pitch (.CW), and microspace justification will not operate. In addition, this type of printer is not capable of handling subscripts and superscripts in the normal fashion; in single spaced text they will be printed in line with the other characters.

- If you wish to use a different type of printer, you will need to make sure that WordStar is installed to match that printer. Refer to the *Printer Installation for the IBM Personal Computer* and select the printer you wish to use. Then, WordStar will provide you with all of the printing capabilities that your printer is able to use.

7. **Block Moves.** If your IBM Personal Computer has 64 K of RAM, you will be limited to moving 900 characters at a time in a block operation (block move, copy, or delete). Lesson 12 of the *WordStar Training Guide* explains block operations. The following applies to the section "Marking a Block," Item 3.a:

- Instead of setting the end marker between the fourth and fifth paragraphs, set it after the first paragraph (just above "Double-Striking").
- For the rest of the directions on block operations, substitute the word "double-striking" for "subscripts."

In Lesson 13 you are asked to make several copies of an article you have typed. You will not be able to copy the entire article at one time if you have a 64 K system:

- Instead, copy single paragraphs of the article. You can copy the whole article this way or just a few paragraphs in order to understand the lesson.
- Omit Step #4 in which you are instructed to make two more copies.
- In the section "Setting an Unconditional Page Break," omit Step #3.

8. **Function Keys and Numeric Keyboard.** The dark keys marked F1 through F10 on the left side of your keyboard are function keys that perform special tasks for you in WordStar. The light keys numbered 1 through 10 on the right side also have special WordStar roles. See the attached charts, *IBM Numeric Keys* and *IBM Function Keys*, to find out what these keys can do for you.

When you're not using WordStar, the function keys will work as described in your *IBM Disk Operating System* manual.

9. Memory Specifications. WordStar requires a minimum 64K of memory when run with IBM PC-DOS. It requires a minimum of 128K when run with IBM CP/M 86 for the IBM Personal Computer. The requirements differ with other operating system configurations – check with your dealer.

10. Additional Features. These are available if your IBM Personal Computer has more than 64 K of memory:

- Simultaneous printing and editing of different files.
- Larger blocks which can be moved, copied, or deleted. (See item "7".)
- File directory with text files in alphabetical order.

Everything you will need to know about WordStar is covered in the manuals. If you have any problems running WordStar, ask your dealer for assistance. Using WordStar should be an exciting and rewarding experience. We hope you enjoy this dynamic word processing program and your new IBM Personal Computer.

11. **Special Key Functions.** The IBM Function keys (F1 – F10) can be used to perform the tasks shown on the table below.

IBM FUNCTION KEYS

IBM Key	WordStar Function	Equivalent WordStar Command
F1	Set help level	^JH
F2	Indent paragraph to tab	^OG
F3	Set left margin at cursor position	^OL ESC
F4	Set right margin at cursor position	^OR ESC
F5	Underline *	^PS
F6	Boldface *	^PB
F7	Mark beginning of block	^KB
F8	Mark end of block	^KK
F9	Move cursor to end of file	^QC
F10	Move cursor to beginning of file	^QR

- * Put cursor at beginning and end of text you want underlined or boldfaced, then hit appropriate function key.

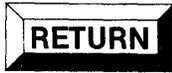
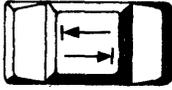
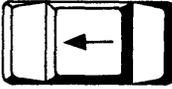
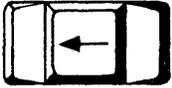
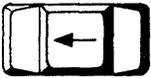
The operation of the numeric keypad (at the right end of the keyboard) is controlled by the Num Lock toggle. To enter numbers, press the Num Lock key. To use the edit functions, press the Num Lock key again.

IBM NUMERIC KEYPAD

IBM Key Number	Edit Function Label	WordStar Edit Function	Equivalent WordStar Command
4	←	Move cursor left	^S
6	→	Move cursor right	^D
8	↑	Move cursor up	^E
2	↓	Move cursor down	^X
7	Home	Move cursor to top left of screen	^QE then ^QS
9	Pg Up	Display previous screen (scroll down)	^R
3	Pg Dn	Display next screen (scroll up)	^C
1	End	Move cursor to bottom of screen	^QX
0	Ins	Insert	^V
.	Del	Delete	DEL

Edit functions on numeric keypad will not operate with "Ctrl" key depressed.

WordStar® Keyboard Equivalents for IBM PC Users

Keys Used on Other Keyboards (As defined in WordStar References)	Keys Used on IBM Personal Computer Keyboard	Key Functions
 "RETURN" KEY	 "ENTER" KEY	Carriage Return or Enter Command
 TAB		Tabs Forward (Does <i>not</i> tab backward)
 BACK SPACE		Back Space
 DEL	 	Delete Character Left (or use IBM "Del" key when activated)*
  	  	Delete Line to Left of Cursor

* "Num Lock" toggle key switches "Del" key on and off.
IBM "Del" key will not function with "Ctrl" key depressed.

WordStar® Quick Guide: Shortcut Procedures

HOW TO	SCREEN DISPLAY	TYPE or PRESS
<p>BEGIN a new document, or revision.</p> <p>Reminder: Maximum filename is 8 characters. An optional period & 1 to 3 characters may be appended.</p>	<p>A></p> <p>(or prompt for disk drive containing WordStar program)</p>	<p>   filename </p> <p>NOTE: To work on a file in B Drive, type  before filename.</p>
<p>SAVE your work so far, then continue.</p> <p>To save your work, then print, use PRINT procedure below.</p> <p>To save your work, then end, use procedure below.</p>	<p>1 TEXT</p>	<p>  </p> <p>Reminder: Hold down  key while typing  .</p>
	<p>2 TO RETURN CURSOR TO POSITION BEFORE SAVE ...</p>	<p>  </p>
<p>PRINT your work and save it on disk. Pages will be numbered.</p> <p>Optional: To omit page numbering, type   above text. Period must be typed in Col. 1.</p>	<p>1 TEXT</p>	<p>  </p>
	<p>2 NO-FILE MENU</p>	<p></p>
	<p>3 NAME OF FILE ... ?</p>	<p>filename </p> <p>NOTE: To stop printing in progress, Press .</p>
<p>END your work, save it on disk, and exit to operating system.</p>	<p>TEXT</p>	<p>  </p>



PRINTER INSTALLATION FOR THE IBM PERSONAL COMPUTER™

WordStar® Version 3.2

WordStar for your IBM PC must be set up (installed) correctly for the specific printer that you want to use. WordStar comes to you on the distribution disk ready to be used with a parallel printer, such as an EPSON MX80. If you want to use WordStar with another type of printer, you will need to modify the installation. You can use the following procedure to modify the installation of your WordStar to match your printer.

You will be working with three diskettes.

1. *MicroPro WordStar 3.2* – Program diskette
2. *IBM PC DOS™* (The IBM operating system)–Program diskette
3. A blank diskette – for your installed WordStar

MicroPro diskettes are not protected against accidental erasing of files. You can make your disk *write protected* by putting a piece of tape over the square notch on the edge of the diskette. This safeguards the diskette from accidentally having anything erased from it. You should write protect the two program diskettes but not the blank one. Also, remember not to touch the exposed surface of the diskette and not to bring the diskettes close to any magnetized object.

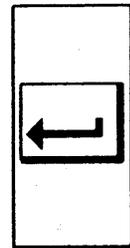
First, make a copy of your WordStar diskette on to the blank diskette. You should not attempt to work with your distribution diskette; rather, always use a copy.

To make a copy:

Step 1: Turn on the power to your computer, terminal and printer. The ON/OFF switch is located on the right hand side of the computer toward the back. Consult your operator manuals for the location of these switches on your printer and terminal.

Step 2: Immediately insert the IBM diskette labeled *IBM DOS* into disk drive A (the one on the left) and close the door. Your computer will automatically read DOS (the IBM operating system) from the diskette. When DOS is completely loaded, (about 1 minute) your computer will ask you for the date. Respond by typing today's date and press RETURN. Your computer will then respond with the prompt A >.

The RETURN Key looks like this:



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NOTE: If you wait too long (over 15 seconds), your computer will beep. You must then reset the computer before you can continue. Turn it off and back on again.

- Step 3: Label the blank diskette *WordStar Working Diskette*. Insert the diskette into disk drive B (the *IBM DOS Diskette* should still be in disk drive A). The following command sequence will format the blank diskette and put a copy of IBM DOS onto your *WordStar Working Diskette*. The commands you type are shown in boldface.

A>FORMAT B:/S Press RETURN

When your computer has successfully formatted the diskette, it will ask you if you want to format another with the prompt: Y or N (Yes or No). Type N and you will get another A> on the screen. This formatting option copies IBM DOS onto your *WordStar Working Diskette*.

- Step 4: Remove the *IBM DOS Diskette* from disk drive A and set it aside. You will use it again later. Remove the *WordStar Working Diskette* from disk drive B and insert it into disk drive A.

- Step 5: Copy your *MicroPro WordStar 3.2 Diskette* onto your *WordStar Working Diskette*. Locate your *MicroPro WordStar Diskette* and insert it in disk drive B. Remember to have it write protected.

Use the following commands to proceed with the copying. The computer prompts you with A>. Type them exactly as you see here, including the spaces. Press the RETURN key after you type each command. Before you type the next command, wait until the computer has finished copying the file and tells you that the file was copied successfully.

A>COPY B:WS.COM A: Press RETURN
A>COPY B:WSMSG.S.OVR A: Press RETURN
A>COPY B:WSOVLY1.OVR A: Press RETURN
A>COPY B:EXAMPLE.TXT A: Press RETURN
A>COPY B:INSTALL.BAS A: Press RETURN
A>COPY B:WSBAUD.BAS A: Press RETURN

If you have the MailMerge™ option:

A>COPY B:MAILMRGE.OVR A: Press RETURN

After you have copied all the files on the diskette, remove the *MicroPro WordStar Diskette* from disk drive B and put it in a safe place. You will normally not need to use it again.

Your next step is to install WordStar for your printer. Again, locate your copy of the *IBM DOS Diskette* and insert it into disk drive B. This diskette contains the file `BASICA.COM`. Your *WordStar Working Diskette* should still be in disk drive A. Your system should now have diskettes with the following files on them (as well as other files that are not used for this procedure). You can check to see if the files are present by using the `DIR` command.

Disk Drive A: `WS.COM`
`INSTALL.BAS`

Disk Drive B: `BASICA.COM`

You are now ready to install WordStar.
Type:

`A>B:BASICA A:INSTALL` Press `RETURN`

Respond to the prompt by pressing `RETURN` to install `WS.COM`.

Name of file containing WordStar (`WS.COM`)?
Press `RETURN`

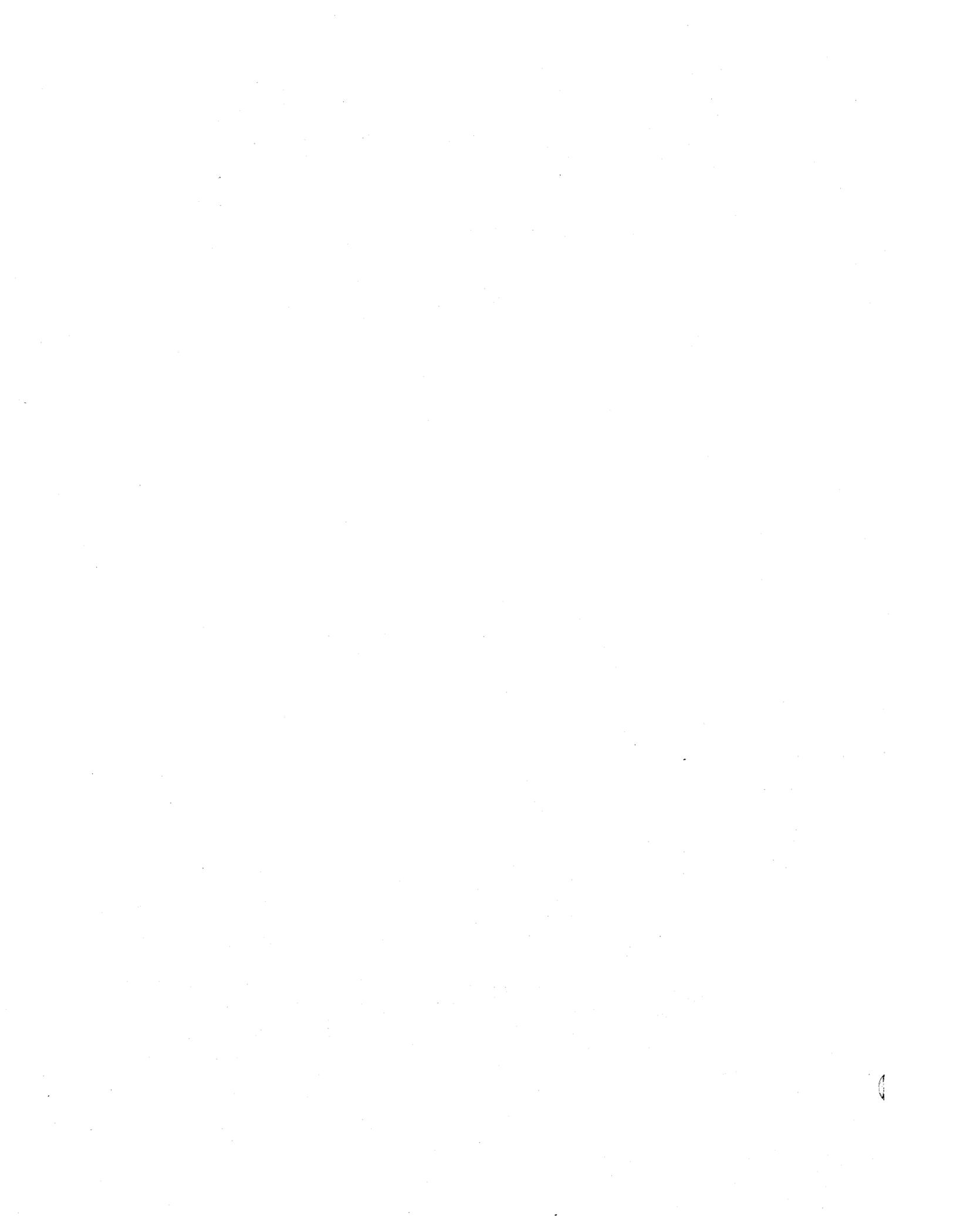
NOTE: If you type a file name that does not exist in response to the above prompt, you will get the message "Bad file in 200". You may type "run" to start the `INSTALL` program over.

The screen will then show you the list of printers. Type the number that corresponds to your printer and press `RETURN` to enter your selection.

1. IBM Parallel Printer
2. NEC 5510/5520 Spinwriter
3. QUME Sprint 5
4. C.Itoh StarWriter
5. Diablo 1610/1620/630* Printer
6. Diablo 1640/1650/630* Printer
7. Serial Backspacing Teletype-like Printer
8. Other serial Teletype-like Printer

*Diablo 630s come in two different models. See Appendix B.

The computer will then ask you about setting the baud rate. The baud rate is the speed at which your computer communicates with your printer. Respond `Y` for yes and set the baud rate to match your printer. See your printer operating manual to find out which baud rate your printer uses.



For example, many printers use a baud rate of 1200. You would proceed as follows to set the baud rate to 1200.

Do you want WordStar to always automatically
set the printer baud rate (y/n)? Y

BAUD RATE SELECTIONS

1 300 BAUD
2 1200 BAUD
3 2400 BAUD

Please enter selection (1/2/3): 2

Installation complete

WordStar would now be set to communicate with your printer at 1200 BAUD.

If you respond N for No to the baud rate question, the computer would respond by telling you to use WSBAUD to set the baud rate. You can use WSBAUD (WSBAUD.BAS) to set the baud rate for your IBM PC. However, the setting will only be in effect as long as the computer is not rebooted from a cold start. You use WSBAUD as follows. The *IBM DOS Diskette* should be in disk drive B and the *WordStar Working Diskette* in disk drive A.

A>B:BASIC A:WSBAUD Press RETURN

The computer will show you the following screen:

```
-----WSBAUD-----  
1 => 110 baud  
2 => 300 baud  
3 => 1200 baud  
4 => 2400 baud  
5 => 4800 baud  
6 => 9600 baud
```

There are typically two situations when you would want to use WSBAUD in preference to installing the baud rate in WordStar.

1. A WordStar that does not have the baud rate installed will try to communicate with the printer at 9600 baud. If your printer operates at a baud rate other than those available from WordStar, you need to set the baud rate at each session using WSBAUD.
2. You can use WSBAUD to help you determine the baud rate of your printer. Experiment by trying different settings until you find the baud rate that works for your printer.

When using WSBAUD, you may get the message "Device Timeout in 350". This means that you do not have a printer connected properly to your computer or that it is not turned on. You can type the command "System" to return to IBM DOS (the operating system).

When the installation is completed, you will be returned to your operating system (A>) and WordStar will be ready to print properly on your printer. Remove the *IBM DOS Diskette* from disk drive B.

If your printer is not listed on the screen, you still may be able to modify WordStar to work for your printer. Installing WordStar for a Serial Printer (Menu selection 7 or 8) will work for most printers. However, this installation will not allow you to use some of the more sophisticated features of many printers such as subscripts, microjustification, and so forth. You can try to install WordStar for each type of printer until you find one selection that matches your printer. Changing the printer selection does not do anything to permanently alter other sections of the WordStar program, so you are free to experiment.

After your installation is completed and working properly, you may want to erase the following files from your *WordStar Working Diskette* to give you more disk space for other program files.

```
A>ERASE A:INSTALL.BAS
A>ERASE A:EXAMPLE.TXT
A>ERASE A:WSBAUD.BAS
```



Appendix A

Wiring Considerations

A special cable is required to connect your IBM PC to a printer. Your dealer should be able to provide you with one.

You can make your own cable by connecting the pins between your computer and the printer according to the following chart. Only the pins that are indicated should be connected. None of the other pins are used.

IBM Personal Comp Connected to Printer

Pin #	<----->	Pin #
2	<----->	3
3	<----->	2
6	<----->	20
20	<----->	6
5	<----->	4
4	<----->	5
8	<----->	8
7	<----->	7

Note that since some printers differ in their pin configurations, you may have to refer to the installation manual for your printer if this does not work.

The printer cable connects to your IBM PC using serial port #1 of the Asynchronous Communications Adapter located on the back of your computer.

Appendix B

Special Considerations for the Diablo 630 Printer

The Diablo 630 printer was manufactured containing one of two slightly different driver boards. There is no easy method for you to determine which driver board your printer contains. We therefore recommend that you follow the following steps:

- Step 1: Install your WordStar with the selection for the Diablo 1640/1650/630 printer (menu selection 6). Then, test your installation to see how it performs with your printer. The file EXAMPLE.TXT on your *WordStar Program Diskette* contains many of the print functions that WordStar is able to do. If it performs correctly, all is well and you need go no further. If your printer has a driver board that does not match this installation, you will notice that it does not perform as you expect. This condition does not harm the printer in any way; however, you will need to go onto the next step.
- Step 2: Rerun the installation program. This time install your WordStar with the selection for the Diablo 1610/1620/630 printer (menu selection 5). The printer should now operate properly.



WordStar Manuals

WordStar is currently being documented in two new manuals for beginners. Included with WordStar is the first manual, **WordStar Training Guide**. The second manual, **WordStar Advanced Training Guide**, will be available soon.

The manual you are holding in your hands is comprised of two or three sections:

- o **WordStar General Information Manual**
- o **WordStar Reference Manual**
- o **WordStar Installation Manual** (included when needed by user)

These three manuals may be found in this binder under different colored tabs. Turn to one of the colored tabs ("General," "Reference," or "Installation") for the information you are looking for:

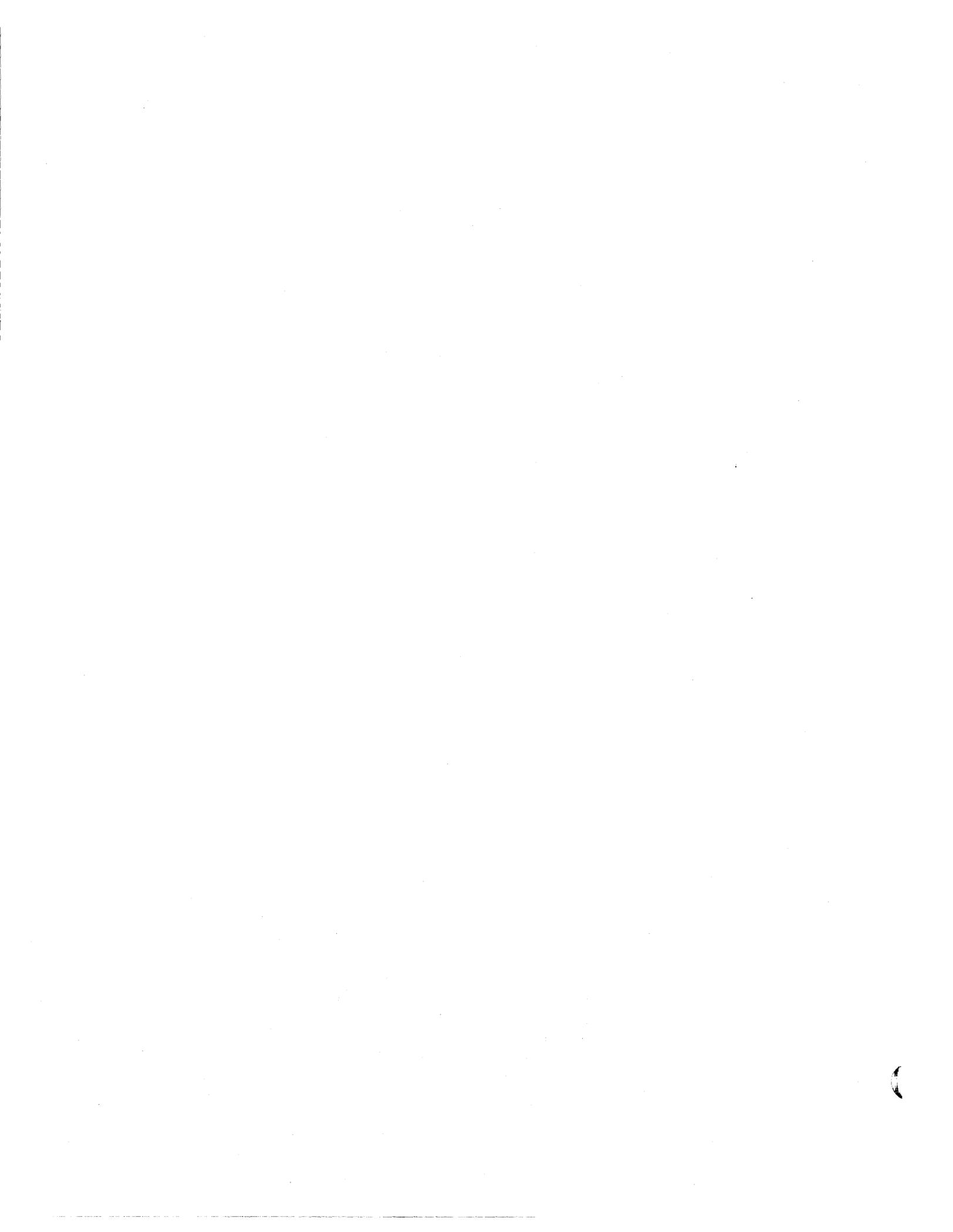
For an overview of WordStar's features without any detailed explanations, read the **General Information Manual**.

To choose a system on which to use WordStar or to determine whether your present system is adequate, read Section 1 of the **Installation Manual**. If you have just received WordStar and you are ready to make it work on your equipment or if you need to make custom changes, continue reading under the appropriate section (terminals, printers, printer protocols, printer drivers, or label patcher).

If you have a running WordStar system and you are ready to start using it, read Sections 1 and 2 of the **Reference Manual**. Detailed explanations of editing commands may be found in Sections 3-6; explanations of ordinary printing commands, in Sections 7 and 8; explanations of optional MailMerge commands, in Sections 9-12. You will find a summary of all WordStar commands in Appendix A, and error messages in Appendix B.

WordStar is rich in command functions. It has all the basic functions for simple tasks, of course, but it also has many time-saving convenience functions that perform what would otherwise require numerous basic functions. So when you begin learning WordStar, you can start with the most essential commands at first. Then, as you become more proficient, you can pick up the others that you need later on.

Other helpful aids in using WordStar include the screen menus, the Help Menu explanations, and the **WordStar Reference Card**. If you need even further help, you can always ask your dealer.



W o r d S t a r
for IBM Personal Computertm
Version 3.2

General Information Manual

WS-3630-1

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Section 1 Introduction

AN OVERVIEW OF WORDSTAR

WordStar is a screen-oriented word-processing system with integrated printing. Both initial entry of text and alteration of text previously entered are displayed directly on the screen. Most formatting functions take place immediately, resulting in the display of a true print image; additional enhancements are performed during printout. The MailMerge option adds form letter generation and other capabilities. Originally designed for use under the Command Program for Microprocessors (CP/M), WordStar has since been modified for use on other operating systems.

THE EDITING FUNCTION

WordStar's editing function is used to create and alter documents stored on disk. Features of the edit function include video editing, automatic disk buffering, on-screen text formatting, powerful editing commands, flexible find and replace commands, help system, dynamic page break display, precise control of text format, and hyphen help.

Video Editing

A portion of the document being entered or corrected is always shown on the terminal screen; additions and corrections are immediately displayed. Text entry is accomplished merely by typing the desired text; command functions such as cursor motion or deletion of text are quickly accomplished with visual feedback.

```

A:TEST.DOC PAGE 1 LINE 1 COL 1          INSERT ON
      <<<   MAIN MENU   >>>
  --Cursor Movement-- | -Delete- | -Miscellaneous- | -Other Menus-
^S char left ^D char right | ^G char | ^I Tab  ^B Reform | (from Main only)
^A word left ^F word right | DEL chr lf | ^V INSERT ON/OFF | ^J Help ^K Block
^E line up  ^X line down  | ^T word rt | ^L Find/Replce again | ^Q Quick ^P Print
  --Scrolling--      | ^Y line | RETURN End paragraph | ^O Onscreen
^Z line up  ^W line down  |         | ^N Insert a RETURN |
^C screen up ^R screen down |         | ^U Stop a command  |
L-----!-----!-----!-----!-----!-----!-----!-----!-----!-----!-----R
WordStar is a screen-oriented word-processing system with
integrated printing. Both initial entry of text and alteration
of text previously entered are displayed directly on the screen.
Most formatting functions take place ■

```

Typical Screen Display

Automatic Disk Buffering

The size of a document is not limited by the amount of random access memory (RAM) in your computer, but by disk capacity. Text is brought into RAM as required, with no operator intervention or concern.

On-screen Text Formatting

Text is displayed on the screen as it will appear when printed, thereby facilitating review and correction before printing. On-screen text formatting is accomplished with the aid of these features: word wrap; automatic margination, justification, line spacing, and centering; and paragraph re-form.

WORD WRAP

Paragraphs may be entered at high speed without striking the RETURN key. When a word exceeds the right margin, WordStar automatically moves the word being entered to the next line and justifies and redisplayes the line just completed. The RETURN key is used only to indicate the end of a paragraph, blank line, or other point where a permanent line break is desired. The typist need not break rhythm to think about the end of the line, nor feel the necessity of looking up from the material being entered.

AUTOMATIC MARGINATION, JUSTIFICATION, LINE SPACING, AND CENTERING

With word wrap in effect, each completed line is automatically adjusted to fit the left and right margins, justified (right-aligned) unless the user has selected ragged-right format, and, optionally, double-spaced or triple spaced. A line of text can be centered between the current left and right margins with a keystroke command.

PARAGRAPH RE-FORM

Text from the cursor position to the end of the paragraph may be "re-formed" on command to change the margins or line spacing, to change from ragged right to justified or vice versa, or to clean up after alterations.

Powerful Editing Commands

In addition to the basic functions—cursor motion, scrolling, text deletion by character, word, or line, and selection of insertion or overtyping—WordStar's editing commands include the following:

- o set or clear a **variable tab stop**—ordinary or decimal
- o move, copy, or delete a **block**
- o set or move to a **place marker**
- o **find** or **find and replace** text
- o write to and read from **additional files**

Flexible Find and Replace Commands

Searching operations and substitution operations can be done once, n times, globally (on the entire document), on whole words only, ignoring case (upper or lower), and/or selectively (the operator is asked whether replacement is to be performed in each instance).

Help System

A menu of commands appears at the top of the screen during editing, or may be suppressed for additional text display area. When the first character of a two-character command is entered, after a short pause the menu automatically changes to show all commands that begin with the key just entered. Additional explanations of various topics can be called up at will, by selecting from the **Help Menu** (shown here).

```

^J      A:TEST.DOC  PAGE 1 LINE 1 COL 1      INSERT ON
          < < <      H E L P  M E N U      > > >

H Display & set the help level | S Status line | —Other Menus—
B Paragraph reform (CONTROL-B) | R Ruler line  | (from Main only)
F Flags in right-most column  | M Margins & Tabs | ^J Help ^K Block
D Dot commands, print controls | P Place markers | ^Q Quick ^P Print
I Index of commands           | V Moving text  | ^O Onscreen
                              |                | Space Bar returns
                              |                | you to Main Menu.
L-----!-----!-----!-----!-----!-----!-----!-----!-----!-----R
█

```

The Help Menu

Dynamic Page Break Display

Within certain limitations, the page breaks that will occur at printout are indicated on the screen during editing, and change appropriately in response to every insertion or deletion. Thus printing is unnecessary to review page layout or page break positions.

Precise Control of Text Format

WordStar remembers which spaces and carriage returns were typed by the operator and which were inserted by the word wrap or paragraph reform operation. For example, if text is entered with two spaces after periods, the spaces will remain through the initial word wrap and any later reforming, even if they fall initially at end of line and later in mid-line. Anything produced by the automatic formatting features can be altered by explicit editing commands afterwards. All automatic features can be disabled.

Hyphen-Help

WordStar can identify desirable places to divide a word between lines with a hyphen. At each occurrence, the operator may decide whether to hyphenate, and optionally adjust the hyphen position. Hyphen-Help inserts **temporary hyphens** which do not print if moved to mid-line by later reforming.

Moving Text and Wide Documents

WordStar allows you to move either an ordinary block of text or a column of text, as in a table. For documents more than 80 columns wide, WordStar also allows horizontal scrolling of text in either direction.

THE PRINTING FUNCTION

WordStar's printing function is used to print documents which have been entered and saved on disk with the edit function. The print function features **concurrent printing** — one document may be printed while another is being edited. Print formatting features include page formatting, pagination control, special effects, microspace justification, and operator options.

Page Formatting

Each page is vertically formatted with top margin, variable **heading** and **footing** texts, page number, and bottom margin. The page size and margins may be specified with "dot commands" inserted in the document; defaults make such specification unnecessary for typical cases. The heading and footing may be changed as many times as desired throughout the document.

The **page number** appears by default at bottom center, but may be placed at top, bottom, left, center, right, or alternating left and right via specifications in the heading and/or footing texts. The page number may be set to any number desired, or suppressed completely.

Pagination Control

Page breaks occur whenever the page is full, or in response to unconditional page or conditional page directives in the document. Conditional page directives allow specifying that a group of lines is to print together, at the top of the next page if they will not fit the current page. Use of these commands will prevent inappropriate page breaks without the necessity of explicitly readjusting page ends every time changes are made in the document. Page breaks are shown on the screen during editing.

Special Effects

Underline, **Double Strike**, **Boldface**, and **Strikeout** are generated at print time, in response to special characters imbedded in the document. WordStar can print these enhancements on regular printers as well as on daisy-wheel printers. During editing, the special characters used to invoke the enhancements are displayed at the beginning and end of the affected text, allowing most standard CRT terminals to be used.

Subscripts (CO₂), **superscripts** (e^{2x}), **variable character pitch** (pica, elite, or your choice of number of characters per inch), **variable line height** (6, 8, or your choice of lines per inch) and alternate ribbon color are fully supported on daisy-wheel and other incremental printers, and within limitations on Teletype-like printers.

Underline, double strike, boldface, and strikeout may be used freely in **mid-paragraph** as well as in separate lines such as titles; use of these features is completely compatible with word wrap and paragraph reform. Print enhancements may be used in all **combinations**. For example, underlined text and boldfaced subscripts are possible (A_x).

Microspace Justification

When printing justified text on a daisy wheel printer, the white space in each line is evenly distributed between the words and characters for superior appearance. On printers not capable of incremental spacing, and on the terminal display while editing, justification is accomplished by varying the number of blanks between words.

Operator Options

The operator may specify any combination of the following printing features:

- o starting and ending page numbers
- o use of "form feed" characters
- o pausing between pages for single-sheet paper loading
- o printing exact file contents without page formatting
- o outputting to a disk file instead of the printer

Print operation can be suspended or aborted at any time while printing is being performed, whether or not a document is being edited.

THE MAILMERGE OPTION

WordStar's MailMerge option allows production of form letters and provides other enhanced printing capabilities. The separately supplied MailMerge option activates the "MailMerge" command. The MailMerge command has all of the capabilities of the regular print function (as described above) except the ability to edit while printing, plus a number of additional capabilities, including the following:

Merging Text

MailMerge can insert variable information into a document and automatically print a copy for each set of data. For example, a personalized letter can be produced for each name and address on a mailing list. The letter is prepared with the edit function in the usual manner, with imbedded directives added to control the merging. The information to be inserted commonly comes from a "data file"; alternately, the operator may be queried for variable information, or values may be set at the beginning of a document for insertion at multiple places in the document.

Data Files

Data files containing mailing lists or other information to be inserted into documents by MailMerge may be prepared with WordStar's edit function or with MicroPro's screen-oriented data entry program, DataStar. The compatible format used also allows generation of data files by programs written in BASIC or another language.

Nested and Chained Printing

One document may invoke another document file by name during printout. "Boiler plate" paragraphs used in many documents can be recorded on separate files and invoked from as many documents as desired; insertion of variable information and reformatting may be performed during printout of the invoked file. A large document that is maintained on multiple files may be printed with a single operator request through the use of a control file containing commands to invoke printout of the various sections.

Screen Display and Input

Commands may be imbedded in a document file to display messages to the operator on the screen during printout, and to request operator input of variable information.

Printing Multiple Copies

A command may be imbedded in a document to cause repeated printing. Such repetition also occurs automatically when variable information is read from a data file. In addition, the operator may request multiple-copy printing when MailMerge is invoked. The operator-requested multiple-copy printout complements that invoked by commands in the file, to permit producing (for example) two or more copies of each letter printed from a mailing list.

Print-Time Formatting

The forming of text into lines, normally done during text entry with WordStar's edit function, is also performed by MailMerge. Thus, variable information may be inserted in mid-paragraph; MailMerge will realign the margins as necessary.

ADDITIONAL WORDSTAR FEATURES**Keyboard Buffering**

If the operator types faster than the screen display can respond, the key-strokes are saved until they can be processed. Also, screen updating is usually suspended until WordStar catches up with processing all the key-strokes. Thus, the operator can enter text or type commands at high speed, then pause when he/she wishes to see the latest screen display. The only exception to this is during disk I/O, which is indicated by a message at the top of the screen as well as the usual noise from the disk drive.

Convenient Defaults

While WordStar has many options and user-set quantities, all are set to generally useful values at startup. For example, the left margin is at column 1, the right margin is at column 65 and there are tab stops every 5 columns. The page paper length defaults to 66 lines long for normal 11 inch forms, with margins at the top and bottom. Thus, WordStar can be used initially without even knowing how to change these variables, and there will rarely be need to change more than a few of them for a typical document.

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Section 2 System Requirements

COMPATIBILITY

WordStar is **compatible** with a wide variety of hardware configurations, and can share files with other software:

File Compatibility

The disk files used by WordStar for documents are standard text files, with very minor additions; a "non-document" edit mode is available to suppress even the minor differences. All formatting features such as word wrap, justification, and settable tabs can be individually enabled and disabled. The formatting performed by the print command can be suppressed.

Thus, WordStar is useful as a **general purpose text editor/print despooler** as well as a self-contained word processing system. It may be used to edit program source files, to input files for other text formatters, for data entry, etc. The print function may be used to print output written to disk by other applications or programs (even while you use the edit function to prepare the input for the next run!).

Terminal Compatibility

Once installed, WordStar's video editing function will operate on almost **any CRT terminal or video board** 16 x 64 or larger that has a cursor positioning function and that is accessible as a console device under the operating system. If the CRT has line insert and line delete functions, these will be used for faster screen update after changes in the text. If the CRT has a highlighting method such as inverse video or bright/dim, the highlighting method will be used to distinguish menus and other prompts from the text being edited, as well as for distinguishing blocks of text "marked" in preparation for block copy, move, or delete.

Printer Compatibility

WordStar will drive almost any printer, whether it is Teletype-like or daisy wheel, and whether it is accessed via a "list output" logical device or via direct hardware I/O instructions issued by WordStar.

For daisy wheel and similar incremental printers, variable line spacing (1 to 127 forty-eighths of an inch), variable character pitch (1 to 127 one-hundred-twentieths of an inch), and automatic microspace justification are supported. For other printers, selection of two character widths is supported (when supported by the printer) and limited user-definable access to other special control sequences is provided. Subscripts, superscripts, and boldface text print differently on non-incremental printers.

It is possible to use a fast printer for drafts and a daisy wheel for finished copy with no special considerations other than creating two versions of WordStar installed for different printers.

EASY INSTALLATION

The **INSTALL** program is supplied with WordStar if WordStar is not pre-installed for a certain configuration of terminal and printer. **INSTALL** allows easy menu selection of any of about twenty common **terminal types** and one of the following printers:

- o **C. Itoh/Starwriter**
- o **Diablo 1610/1620/1640/1650/630**
- o **Qume Sprint 5**
- o **NEC Spinwriter 5510/5520/5515/5525/5530**
- o **Teletype-like printer**

Operation of the **INSTALL** program is described in the **Installation Manual**. Installation for unusual terminals, video boards, and printers in some versions of **INSTALL** is handled by "patching" the program. Extensive provisions have been made for user patching to accomodate various console and printer devices, as well as to customize other features. Such modifications are discussed in the **Installation Manual**.

THE TERMINAL

The Screen

The screen is capable of displaying at least 16 lines of 64 characters; 24 lines of 80 characters is a common size. We will refer to the leftmost character position on each line as "column 1", and the rightmost character position as "the right-most column" since the actual number of columns on the screen varies from terminal to terminal.

The Cursor

The cursor indicates where the next character will appear on the screen. Depending on the terminal, the cursor may appear as a rectangle, triangle, or underline, and may or may not blink.

Highlighting

Many terminals have some way of making certain text stand out on the screen. One common method is to use bright and dim display; another is inverse video, whereby the characters to be differentiated are black on a white background instead of white on a black background. If your terminal has one of these highlighting methods and WordStar is installed to use it, WordStar will use highlighting to distinguish menus and error messages from text, and to indicate text in the document that has been "marked" as a block.

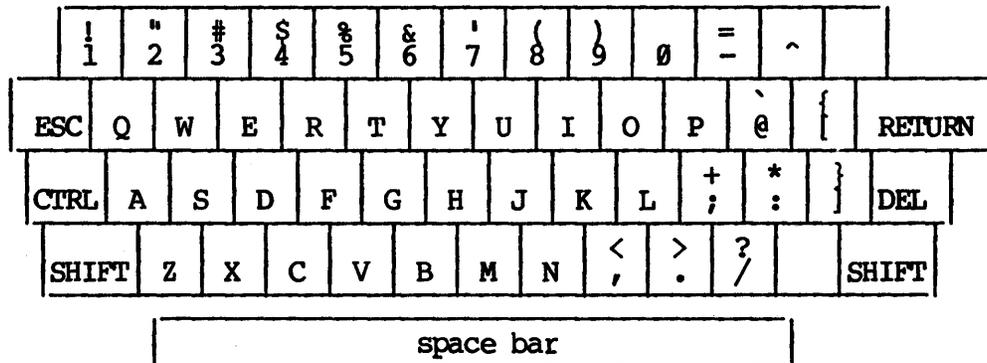
Insert and Delete Line

Many terminals have special control codes to permit deleting or inserting a line of text on the screen, automatically moving the lines below up or down.

If your terminal has these capabilities and WordStar is correctly installed to use them, WordStar will use upward and downward scrolling to achieve rapid screen update as text is edited or scanned.

The Keyboard

Most computer keyboards are similar to typewriter keyboards, but with a number of additional keys. Placement and labelling of keys varies from keyboard to keyboard. A picture of a typical keyboard showing all keys that are essential to use of WordStar is shown below.



Typical Keyboard

The CTRL key is used like a shift key to enter the **control characters** (control-A through control-Z). To type a control character, hold the CTRL key down while typing the letter. In this manual, "control" is abbreviated "^"; that is, ^A means control-A, typed by holding down CTRL and typing an A; ^B means control-B, etc. Control characters are used for **commands** to WordStar, to tell WordStar to do something; other keys enter document characters.

Your DEL key may be labelled DELETE, RUB or RUBOUT and may or may not be shared with the underscore key and may or may not require SHIFT to activate.

Your ESC key may be labelled ESCAPE.

The RETURN key may be labelled CARRIAGE RETURN or ENTER.

Note that the space bar is for entering spaces. Unlike on a typewriter, you cannot use the space bar to move over characters already on the screen.

A number of additional keys may be present, including:

BACKSPACE: same as ^H; use with WordStar for backspacing.

TAB: same as ^I; use with WordStar for tabbing.

Some terminal keyboards have four cursor motion keys with arrows pointing in four directions; these can be activated for WordStar through special installation procedures (check with your dealer).

Many terminals have a REPEAT key which may be held down along with another key to type that character continuously; other terminals auto-repeat any character whose key is held down.

OTHER COMPONENTS

The Disk Drives

In addition to the terminal, a computer suitable for WordStar use has one or more **disk drives** into which **disks** may be inserted for file storage. Your computer may also have a hard disk for more permanent storage of files. To use WordStar, you should know how to load disks into your particular drives. Before beginning extensive entry of documents, you should have a supply of blank disks. Also, remember that you cannot change disks indiscriminately while using WordStar--the appropriate times for changing the disk in a drive will be described in Section 4 ("Changing Disks").

The Rest of the Computer

The remainder of the computer need not be understood to make effective use of WordStar. We will occasionally refer to parts of the computer such as "RAM" (random access memory) for the better understanding of those familiar with such terms; if such words are all Greek to you, don't be concerned.

THE OPERATING SYSTEM

WordStar operates under various operating systems. The operating system is used by WordStar to maintain files of data on disk, and by the user for a number of utility functions. (Files are discussed in Sections 3 and 4.) After turning your computer on, you must start ("boot") your operating system before you can invoke WordStar. Refer to your computer or operating system instruction manuals for "booting" directions.

When you turn on your computer and boot your operating system, the system's "console command processor" (probably referred to as the CCP in your system manuals) is invoked. The system prompt appears (e.g., "A>") and waits for you to enter a command.

WordStar can then be called up by typing "WS" and pressing carriage return, as discussed in greater detail in the **Reference Manual**.

There are also a number of operating system commands ("console commands") which can be given at this point. Functions performed by operating system commands needed in conjunction with WordStar use include:

- o Determining the amount of space left on a disk.
- o Determining the size of a particular file.
- o Making a copy of a file on another disk.

The system's copying utility may be used to make backup copies of documents, as well as to copy system utilities. You may also use the WordStar copy command to copy files (refer to the **Reference Manual**).

Section 3 Files and Disks: Part 1

FILES

Understanding the nature of a file is important to understanding the operation of WordStar. Since we will refer to files frequently, we will discuss them and related concepts before proceeding.

What is a file? A file is a collection of characters stored, in order, under a name, on a disk.

Text files

Files containing text are used to store documents, such as letters, books, and grocery lists, on disk. When you enter a document into the computer with WordStar, you are using WordStar to create a file containing the text of the document. When you make corrections in a document, you are modifying an existing file.

Documents and Files

Generally, we will use the words "file" and "document" interchangeably to refer to the textual material being entered or altered with WordStar. Occasionally, of course, what you think of as a "document" may not correspond to a "file". For example, a book (a large document!) might have each chapter stored as a separate file, or a commonly used paragraph (less than a document) might be stored on a separate file for later retrieval for inclusion in future documents.

Structure of a Text File

The characters are stored in a file containing text in exactly the order you would type them on a typewriter. Every place you would hit the space bar, a "space" character is stored in the file. At the end of each line, where you would return the carriage, there is a "carriage return" character stored in the file.

Note

There really is a "character" for "carriage return" that is stored between lines in the file. You can take advantage of this knowledge when editing a document. For example, if you want to join two lines together, you delete the "carriage return" at the end of the first line. If you command the cursor to back up from the beginning of a line, the cursor goes to the end of the preceding line.

(Technically speaking, there are two characters, called "carriage return" and "line feed", between lines of a text file. Since WordStar automatically manipulates the line feed along with the carriage return, the user need not be aware of the second character except in a few specific contexts which will be mentioned later.)

The Importance of Saving Text

A file is the only non-ephemeral storage in the computer. Text entered into WordStar (or modification to previously entered text) is permanently filed only when the operator gives one of WordStar's save commands. For example, if you enter text then turn off your computer without saving, the text will be gone when you turn the computer on again. **Save your document!**

NAMING FILES

A file is identified by a "name"; this name is typed whenever the file is referred to, (e.g., to determine its size, edit it, or print it). A name is chosen for a file when it is created. The name may be changed with an operating system command or with the WordStar rename command (see "No-File Commands," **Reference Manual**).

Name and Type

As described in detail in your operating system documentation, a file name contains up to three parts: the primary part is a **name** consisting of one to eight letters and/or digits (most punctuation characters can also be used). Lower case letters may be typed in, but they are taken as equivalent to upper case letters. This name can optionally be followed by a period and one to three more characters called the "**type**" or "extension". Commonly, type DOC is used for documents to distinguish them from other files, but blank (omitted) file types also work. Examples of valid file names as described so far:

ABC.XYZ	LETTER.DOC	CHAPTER1.DOC
X	GROCERY.LST	XX5-8-79.DOC

Disk Drive Name

The third part of a file name, a **disk drive letter**, is optional. It is entered first and separated from the rest of the name with a colon. This letter, A or B (or C or D if you have more disks) specifies the disk drive (A or B) containing the file. Examples:

A:ABC.D	B:FOO	B:ABRACADA.BRA
---------	-------	----------------

When no letter is included in the file name, the file name is assumed to be on the disk drive currently logged.

A file name as we have just described it may be referred to as an "unambiguous file name" or "ufn" in your system documentation.

Choosing File Names

File names may be chosen any way you wish, provided the same name and type are not already in use for another file on the same disk, except that you should not use type "BAK" (backup). Choose something that helps you remember the file contents.

DISKS AND FILES

The Logged Disk Drive

The "Logged Disk Drive" (or current logged disk drive or current disk drive) is the disk drive used for any file for which no disk drive letter is entered when the file name is entered. The logged disk drive is usually A when the operating system is started. The logged disk drive may be changed with an operating system command, or with WordStar commands (described later). For example, if you are going to be working with files on disk B, you might find it convenient to change the logged disk drive to B to eliminate the need to type B: before each file name.

WordStar displays the file directory (i.e., the names of all files on the disk) of the logged disk drive. Thus, to view the file directory of disk B, you must change the logged disk drive to B.

Disk Capacity

A disk has a fixed capacity in characters (bytes). This is the total for all files on the disk, including non-text files such as the WordStar program as well as your documents. The exact number of characters varies with the disk type and system; an ordinary 8-inch single-density IBM-compatible disk will hold a total of 241K (243,892) characters on most systems. The total number of files is sometimes limited, but unless you use very short files, the total number of characters is the limiting factor.

If a disk gets full, it may be impossible to save a document that has just been entered or corrected. It is not permissible to change disks after entry or correction of a file has begun, so check your disk space before commencing entry or correction. If the disk you are using doesn't have lots of extra space on it, start another. **Watch your disk space!**

File Sizes

A printed page of text usually contains two or three thousand characters; the exact size of course depends on the line length, number of lines, and number of blank lines. A system console command is available in most systems to display the current size of a given file.

While you are learning WordStar, you will probably work with files of moderate size—several pages only. With such files, it is prudent to keep empty space on the disk equal to twice the size of your largest document. When the space gets less than this, start a new disk; if you are going to be adding to existing files, move some of them to the new disk. Hard disk systems seldom have this problem.

For large files, of course, it may not be practical to keep this much space, as the file may be bigger than a third the capacity of a disk. We recommend that, when practical, large documents be divided into several files of moderate size. For example, each chapter of a book might be a separate file. We will discuss large file considerations further in the **Reference Manual**.

File Backup

Prudent data processing practice includes keeping additional copies of all data. This permits recovery if a file is destroyed by any unforeseen circumstances such as computer breakdown, power failure, accidentally deleting the wrong file, spilling a cup of coffee on the disk, etc.

In microcomputer word processing, the best method of backup is to make a copy of the file **on a different disk**, then remove this disk and store it safely. Any time you have invested considerable effort in correcting or updating a file, exit from WordStar and make another backup. Be sure to label your backup disks carefully - next time you go to use the document, you will want to be sure you can identify the latest version!

Files can be copied with a system command; refer to your system documentation. WordStar also has a file copy command that will be described later. Some systems have a command with a name such as DISKCOPY that makes and verifies a copy of an entire disk; if this is available, it is the best method due to the verification.

Orderly and regular backup procedures take little effort and will save much grief should a file loss or disk loss ever occur. **Back up your files!**

Section 4 Files and Disks: Part 2

SETTING UP DISKS

Initializing disks requires greater understanding of the operating system commands than other aspects of WordStar use. In some installations, a single individual may learn this process, and make a supply of initialized disks for use by a number of typists, who will then need only to understand the operation of WordStar proper. Be sure, however, to keep extra initialized disks at hand and make sure all operators know how to monitor the empty space on their disks.

WordStar Installation

If you don't already have a copy of WordStar installed to work with your terminal and printer, refer to the **Installation Manual** before attempting to initialize a disk or to use WordStar.

WordStar Files

The WordStar program consists of the following files:

WS.COM	Main Program. The program loaded when you call up WordStar. In order to call up WordStar, you must have this file on the disk you call it from (normally A).
WSMSG.S.OVR	Message File. The text of all WordStar messages and menus. This file should always be on disk drive A, or on the logged disk (if other than A)--WordStar will find it either place.
WSOVL1.OVR	Overlay File. WordStar overlays. This file contains elements of the WordStar program, and must be on disk drive A, or on the logged disk at all times in order to use WordStar.

Setting Up a WordStar System Disk

You will normally want to put the following on each WordStar working disk:

1. The "system image": the portion of the operating system read into RAM whenever the system boots or warm-restarts (this includes when WordStar exits to the system). This is not a file, but is on a reserved area of the disk, copied from one disk to another with a special, system-dependent program sometimes called SYSGEN.
2. The files for any system utilities you may wish to use. We recommend a directory utility, a copy utility and a file status utility for all disks.

3. The files required by WordStar:
 - a. WS.COM
 - b. WSMMSG.S.OVR
 - c. WSOVLY1.OVR

Work Disks

A disk in disk drive B can be used for document file storage only. It need have none of the above items on it (provided WSMMSG.S.OVR and WSOVLY1.OVR are on disk A), making its entire capacity available for document storage.

CHANGING DISKS

Change disks only when the system is ready to accept a system command, and after changing disks the system may require you to type control-C (^C). Changing disks at the wrong time, such as when WordStar is editing or printing a file results in errors under some systems, and **destroys existing files** under other systems. Under certain systems, ^C is unnecessary, but it does no harm.

The WordStar Exception

When WordStar is running, disks may be changed if WordStar is neither editing a file nor printing. The no-file menu (described later) must be on the screen, and printing must be inactive. ^C is not used in this case.

Used with caution, this exception is a convenience: it makes it unnecessary to re-invoke WordStar to edit a file on a different disk, and eliminates the need to have WS.COM take up disk space when working with large files.

There is no general provision for changing disks in the midst of an edit. Make sure you have plenty of working space on your disk before invoking WordStar.

Caution

Never change disks while editing or printing!

FILE CHANGES DURING EDITING

When initiating editing with WordStar, the operator enters a file name. This may be the name of an existing file to be altered, or the name of a new file into which text is to be entered. The processes of altering an existing document and entering a new document are the same in WordStar, except of course that the new document starts out empty.

Saving a Document

When an existing document is edited, the changes are entered temporarily into an ephemeral **working document**; no change is made in the permanent disk storage until one of WordStar's save commands is given. When you save the document,

the previous version of the file is changed to type "BAK" (backup), and the contents of the working document are filed under the file name of the previous version (see the illustration below under "Summary").

For example, if you edit a previously entered file named LETTER.DOC, after saving it the new version will be on the original file name (LETTER.DOC) and the version of the document that existed before the edit will now be called LETTER.BAK.

When a new document is entered, the text goes into the working document as it is entered and is permanently recorded on disk only when a save command is given. After saving the first time, the entered text will be on the specified file name. There will be no BAK file since there was no prior version.

To review, the **working document** is the version of the document containing changes and additions made during editing. The original file is not altered until you give a save command (and even then the original version is kept, with type BAK). If the edit is interrupted for any reason—operator command, power failure, etc.--the working document is lost and the original file is unchanged (non-existent for a new file).

The most important point about the working document is its transitory nature: working document text is not permanently recorded on disk until you **save** it. **Save your document!** For convenience, WordStar contains a "save and re-edit" command which does a complete save, then initiates editing of the file just saved. Use of this command periodically during long edit sessions is highly recommended.

Restoring the Backup File

Alternately, if you make changes in a document, then decide before saving that you want the original kept, you may use WordStar's abandon command as described later. This command discards the working document, leaving the original file unchanged.

If you discover after saving that you made drastic errors while editing file LETTER.DOC, you may recover the prior version by using operating system commands to copy or rename LETTER.BAK to LETTER.DOC, or by using WordStar's "read additional file" command.

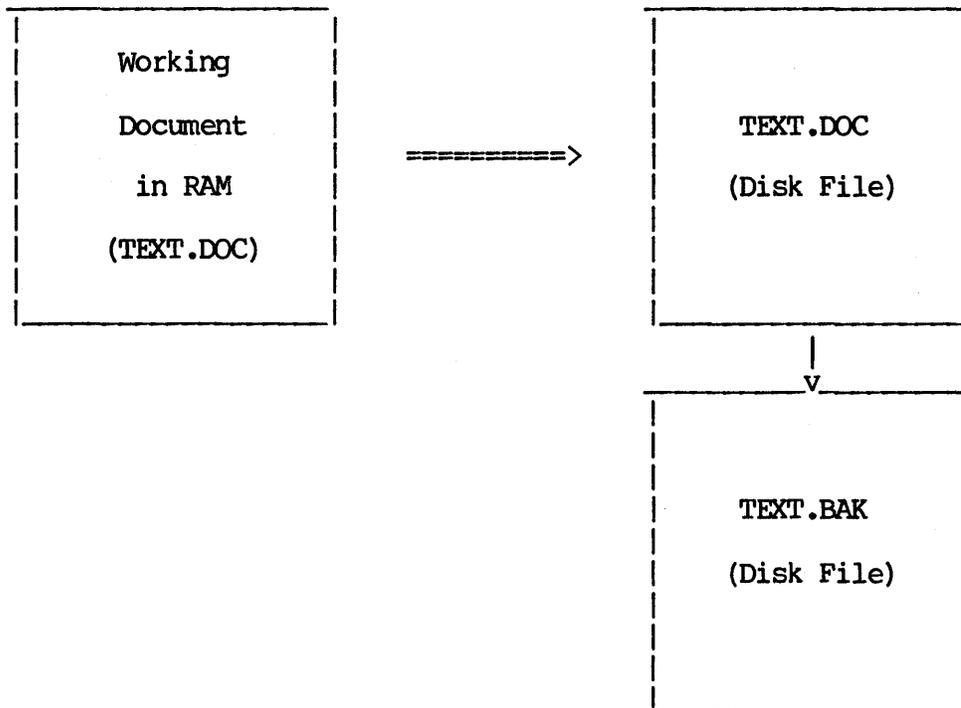
Note that only **one** prior version is kept. If you want to keep a version indefinitely, make a copy on another file name—say LETTER.OLD or LETTER.001. If the "save and re-edit" command is used during an edit, the BAK file (upon completion) will be the version at the last "save and reedit".

Summary

We have made three important points in the above paragraphs:

1. Disk files aren't changed at all until a save command is given, and any work not saved will be lost.
2. When an existing file is edited and saved, the **new version** is filed under the original primary name and type.

3. When an existing file is edited and saved, the **previous version** is filed under the original primary name and type BAK.



Sample Backup Procedure

File Update in Detail

We will now describe the implementation of the working document and the file changes which occur when a file is edited in a more precise and technical manner, and point out implications for large documents. (New and non-technical readers may skip the rest of this section).

During an edit, the working document is stored in RAM and, for large documents, on temporary disk files that are created and erased automatically. Initially, the beginning of the original (input) document is read from disk into RAM for display and possible modification. As you proceed through the document, additional text is automatically read as required. If and when the capacity of your RAM is reached, some of the text from the beginning of what is in RAM is automatically written to a temporary output file.

Upon saving, the rest of the text is copied to this temporary file. Then, any existing BAK file is deleted, the input file is renamed to type BAK, and the temporary file is renamed to the file name being edited, thus becoming the output file.

If you move the cursor backwards through the file over more characters than are contained in RAM (the number of characters RAM will hold depends on how much RAM you have), text is read back from this temporary output file, and, if necessary, text from the end of that in RAM is written to another temporary file. This backing up operation is logically transparent, but it is slow and uses extra disk space for the additional working file.

Thus, large files can be edited most rapidly and with minimum disk space requirements by working forward through the file, from the beginning to the end. To move from near the end to near the beginning, use a "save and reedit" command (^KS) as described later. Saving is a relatively quick operation because, if the cursor is near the end of the document when the save command is given, much of the text is already in the temporary file which is renamed to become the output file.

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Section 5 Editing a Document

This section introduces the concepts and terminology relating to WordStar's on-screen formatting. Section 6 describes those concepts that apply to printing. Descriptions of the specific editing commands and print directives are given in the **Reference Manual**.

LINE-FORMING

Here we will introduce WordStar's on-screen line formatting features, word wrap and paragraph reform, and define a number of terms used when discussing WordStar.

Margins

WordStar uses left and right margins that determine where on the page the text appears and how long the lines are. Like a typewriter, the left margin and right margin are set to the desired columns; the difference between them determines the line length. By default, the left margin is column 1 and the right margin is column 65; commands for changing the margins will be described later.

Line Spacing

WordStar allows you to set single, double, triple, or greater line spacing; the default is single.

Justification

"Justified" text has additional spaces inserted between the words to make the right end of each line in a paragraph come out exactly at the right margin; "ragged right" text does not have these spaces. The bulk of this manual is an example of "justified" text; this particular paragraph is ragged right to provide an example of the difference. WordStar's justification is on by default, but may be turned off to produce ragged right text. Some users prefer ragged right, e.g. for correspondence which they wish to appear hand-typed.

Note

Justified text is always displayed on the screen with whole spaces inserted to achieve justification; this leads to uneven word spacing. However, if you have a daisy wheel printer capable of incremental spacing and WordStar is properly installed for it, the printed copy will be "microspace justified" with the white space added evenly throughout the line.

Margins, line spacing, and justification are all applied automatically by WordStar to text as it is entered, or upon command to previously entered text. We will refer to this process as forming the text; and will describe the process in more detail.

Forming a line

Given a collection of words, WordStar forms a "line" in the document as follows:

1. Establishes the left margin: inserts the necessary number of spaces to move from column 1 to left margin column.
2. Places as many words as fit on the line. If all the words fit, then this is a partial line and WordStar stops here. Otherwise, saves the excess words for later lines and does steps 3 and 4.
3. If justification is on, adds spaces between words to align right margin.
4. Adds a carriage return to the end of the line--or two for double spacing, three for triple spacing, and so on.

Word Wrap

When word wrap is on (as it is by default), lines are automatically formed as text is entered by the operator. The operator types words, without using the return key within a paragraph. On the first keystroke, indentation to the left margin occurs; whenever text is typed beyond the right margin, a line is "formed" as described, and the partly-typed word that did not fit on the line is moved down to the next screen line and over to the left margin. This all happens automatically; the operator just keeps typing, and the lines form on the screen as they will print.

REFORMING A PARAGRAPH

A document is a changing entity. After entry, one usually makes revisions and corrections. During entry, one can pause in typing, read the screen, and immediately start rewriting. Or, one might want to change the margins or line spacing of text already entered, or change text from justified to ragged right or vice versa. Thus, WordStar must be able to "reform" text already entered.

Text is reformed by applying the line forming procedure described above repeatedly until all words to the end of the paragraph have been formed into lines. First, of course, all the spaces and carriage returns added by previous forming are removed.

This brings us to a very important point. WordStar must know where the paragraph ends. When reforming, the words in a paragraph are regrouped, frequently changing the line break points. However, the reforming process must not continue across the end of a paragraph - the next paragraph must begin on a new line, even if the last line of the preceding paragraph was not full of words. The same situation occurs with tables, columnar lists, etc: the user wants the text in these divided into lines as originally entered; WordStar should never remove the carriage returns between the lines of a table or list. Similarly, user-entered blank lines should not be removed from the document.

Thus, there is the need to record in the file permanent, user-entered line breaks that WordStar will not alter when reforming, as distinct from the line breaks between lines in a paragraph, which are supplied by WordStar and which may be moved or removed as necessary during the reforming of the paragraph. This distinction is handled via permanent and temporary carriage returns.

Carriage Returns

PERMANENT ("HARD") CARRIAGE RETURN

A permanent ("hard") carriage return is a carriage return used at a point in the file where the user wants a line break, as at the end of a paragraph or between lines of a table. All permanent ("hard") carriage returns are explicitly entered by the user, usually with the RETURN key. Permanent carriage returns are never moved or removed by WordStar's reforming process. The presence of a permanent (or "hard") carriage return at the end of a document line is indicated on the screen by a "<" in the rightmost column of the screen.

TEMPORARY ("SOFT") CARRIAGE RETURN

A temporary ("soft") carriage return is a carriage return supplied by WordStar in the process of forming lines, either under word wrap during text entry or during paragraph reform upon user command. Temporary carriage returns will be moved or removed freely by WordStar upon later reformation of the text; thus, they should be present only between lines of a paragraph or at other points where the user does not want a fixed line break. The presence of a temporary (or "soft") carriage return at the end of a line is indicated on the screen by a blank rightmost column.

To review, all carriage returns supplied by WordStar in the process of automatically forming lines are "soft" carriage returns and may be moved or removed by WordStar if the text is later reformed; all carriage returns entered by the user are "hard" carriage returns (indicated by < in the rightmost screen column) and will not be moved or removed except by an explicit editing command.

When entering text under word wrap, do not use the RETURN key between lines of a paragraph, but do use the RETURN key wherever you want a fixed line break (e.g., the end of a paragraph, between lines of a table, after headings and titles, etc). To make a blank line (as between block paragraphs) press the RETURN key a second time.

Spaces

WordStar also makes a distinction between the spaces entered by the user and the spaces supplied by the system:

PERMANENT ("HARD") SPACE

A permanent ("hard") space is a space entered into the file by the user, by pressing the space bar. Permanent (or "hard") spaces are never deleted by WordStar's reforming process.

TEMPORARY ("SOFT") SPACE

A temporary ("soft") space is a space supplied by WordStar in the process of forming lines: the spaces to the left of the left margin, and the spaces added between words to achieve justification (when justification is on). All existing temporary (or "soft") spaces are deleted before a line is reformed, as an insertion or margin change may reduce the number of spaces needed.

WordStar never forgets spaces typed by the user. Spaces that fall at the end of a line are not visible, but they will reappear if later reforming makes them fall in mid line. User-entered spaces at the beginning of a paragraph (after a hard carriage return) are forced to the right of the left margin, like any other character.

When entering text under word wrap, wherever you want a space, type a space. For example, indented paragraphs can be formed by pressing the space bar a number of times just after pressing the RETURN key to end the previous paragraph. This will cause the first line of the paragraph to be indented from the left margin, i.e., a number of columns more than the rest of the paragraph.

If you like two spaces after periods, type that way, and WordStar will never print the sentences closer than that. The spaces may fall at the end of the line when initially entered, but they will be remembered. (The sentences may also print farther apart, because of justification.)

Hyphenation

WordStar has a "hyphen-help" feature that allows you to hyphenate words when reforming paragraphs for better line appearance. When WordStar is reforming a paragraph and encounters a word that will not fit at the end of a line, a prompt will be displayed to allow you to insert a hyphen if desired before continuing to reform the paragraph. WordStar will indicate a position for the proposed hyphen; you may place the hyphen elsewhere within the word if you prefer. After the word has been hyphenated, or if you instruct WordStar to skip the hyphen, WordStar will continue reforming the paragraph. Hyphen-Help may be turned on or off as desired.

Summary of Reforming

Text that has been entered with the RETURN key used only at paragraph ends, blank lines, and other fixed line breaks can be partially or wholly reformed at will to change the margins, line spacing, or to change between justified and ragged right format. There is nothing done by word wrap as text is entered that cannot be redone as often as desired by the paragraph reform command. Thus, one can initially concentrate on entering the text of a document without regard to format; subsequently, one can manipulate the margins, spacing, and justification to achieve the desired appearance.

Section 6 Printing a Document

PRINT FORMATTING

Section 5 described line forming, which is done as text is entered and altered and is recorded in the file and visible on the screen. This section introduces the additional formatting operations done as text is being printed by the print function, under the control of optional print directives entered in the file.

Pagination

The print function divides the text into pages, and can add headings and page numbers. Page breaks (both conditional and unconditional) can be specified by the user where desired; otherwise the print function starts a new page whenever a page is full.

Since the appropriate places for page breaks can change as text is added, deleted, or moved, the page breaks are not recorded in the file. However, the places where they will fall are displayed on the screen by the dynamic page break display feature, described later in this section.

Special Effects

Subscripts, superscripts, boldface, underline, and other special printing effects are activated by special characters entered into the file before and after the desired text. During editing, these characters display as control characters; during printout, the print function responds appropriately to produce the desired effect. These features may thus be used freely in mid-paragraph — they fall through word wrap and paragraph reform with no special user consideration; there is no need to manually align the underline with the text to be underlined, or to align the subscript with the space it prints in.

OTHER PRINTING FEATURES

Changes in line height, character width, and ribbon color, insofar as supported by your particular printer, can also be performed by the print function in response to directives imbedded in the file.

User control of print formatting is accomplished via print directives imbedded in the file. WordStar has two types of print directives, print control characters and dot commands.

Print control characters are single-character directives for functions such as begin/end underline or change ribbon color; print control characters can be used freely in mid-word, mid-line and mid-paragraph.

Dot commands are special lines entered into the file for functions such as setting the paper length, or specifying a page heading, or causing a new page to be begun. All dot commands have defaults suitable for normal use.

Print Control Characters

Print control characters are single-character commands entered into the file to specify functions, including begin/end underline, begin/end strikeout or change ribbon color.

For example, a control-S character in the file turns underlining on, if off; or off, if on. To print

The word underline is underlined.

type the following:

The word ^P^Sunderline^P^S is underlined.

and see this displayed on the screen:

The word ^Sunderline^S is underlined.

(where ^S represents a control-S character—not a caret and an S!)

As described in more detail in the **Reference Manual**, a print control character is entered into the file by typing a special prefix (^P), then the desired character. If typed without the prefix, control characters perform editing command functions.

As another example, a control-H character in the file causes the the character after the control-H to print in the same position as the character before the control-H. This facility is useful for printing accent marks over letters, as used in a number of European languages. To print

le dix-septième siècle

type the following:

le dix-septie^P^H`me sie^P^H`cle

and see this displayed on the screen:

le dix-septie^H`me sie^H`cle

All the print control characters are described in the **Reference Manual**.

Print control characters can be used freely in mid-line and in mid-paragraph; they are treated as other file characters and fall through word wrap and paragraph reform with no special operator consideration. When a paragraph is reformed, the underlines, etc. move with the words; a phrase can be underlined with two ^S's, one at the beginning and one at the end. It doesn't matter if the end is on a different line from the beginning.

However, the columns they occupy on the screen are disregarded in forming lines, since the characters themselves don't print. Thus, if a line in a paragraph contains an underlined word, that line will appear longer when justified on the screen, because of the print controls to start and stop underline. Each print control displays as an ^ and a letter.

Dot Commands

Dot commands are special lines entered into the file for purposes such as positioning the text on the paper, setting the page number, or starting a new page. Dot commands do not in themselves print, but control the printing. The dot commands have defaults suitable for normal use; you can begin using WordStar without using dot commands at all.

The general form of a dot command begins with a period (hence the name), in column 1 (i.e., immediately after a carriage return), followed immediately by a 2-letter code in upper or lower case identifying the function, optionally followed by a number, text, or other argument depending on the particular command. A number, if used, may be separated from the code by nothing, 1 space, or several spaces. Any additional text on the same line (up to and including the next carriage return) is assumed to be a comment and is not printed. Here are three examples:

.MT 5	Indicates that a 5-line margin is to be used at the top of each page
.HE Section II	Indicates that "Section II" is to be printed at the top of each page until another HE command is given
.CP 12	Starts a new page if fewer than 12 lines remain on the current page

Full descriptions of all the individual dot commands will be given in the **Reference Manual**. WordStar can be initially learned using the default page format. Dot commands are being introduced here because they will be referred to frequently in subsequent sections. Dot commands are normally used in conjunction with documents rather than programs. Since dot commands invoke print functions, they do not appear in the printout unless print formatting is suppressed.

Dot commands are entered into the file like any other text, using the edit function as will be described in the following sections. Dot command lines are not counted as lines in the page for page break determination, since they do not print unless print formatting is suppressed.

The print function has no error messages for dot commands. Unrecognized dot command lines have no effect, and are not printed: they are assumed to be comments. However, unrecognized or incomplete dot commands are brought to your attention during editing with a "?" in the rightmost column of the screen line.

Avoid document lines intended for printout that begin with a period in column 1, as they will be taken as dot commands and not printed. For example, be sure that a space or other character appears before any ellipsis you use. A "trick" to use in this case is to place control characters (such as ^S^S) in column 1. The control characters will be dropped when your document is printed. (See the **Reference Manual** for details.)

Dynamic Page Break Display

Dynamic Page Break Display is the ability to continually determine and display, while the document is being changed, where the page breaks will fall during printing. The pagination information is displayed in two ways: the page and line where the cursor is positioned are displayed on the top line of the screen, and the following display appears at each page boundary:

-----P

A page break is displayed wherever a full page would occur on printout, and wherever a page break is caused by an unconditional page (.PA) or a conditional page (.CP) dot command.

Dynamic page break display responds to those dot commands which influence the number of lines printed on a page:

.LH (line height)	.MT (top margin)
.PL (paper length)	.MB (bottom margin)

However, response is limited to these commands at the very beginning of the file only, as documents are handled with a constant number of lines on a page. (The print function will handle arbitrary changes in vertical page format; the dynamic paging limitation relates only to display of page breaks while editing.)

If one of those dot commands appears in the file in a position where dynamic page break display cannot handle it, a warning message appears next to it on the screen and the command is ignored for page break display purposes. In this case, the printed page breaks may not be the same as those displayed on the screen during editing.

Dynamic page break display can be turned off and is always disabled in the non-document edit mode.

W o r d S t a r
for IBM Personal Computertm
Version 3.2

Reference Manual

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INTRODUCTION

WordStar is a powerful, comprehensive word-processing system that is easy to learn and easy to use. Although WordStar has a wide range of functions and commands, its use at the keyboard is simplified by screen menus that may be varied for different levels of users. Even though this manual contains over a hundred pages of detailed explanations, this does not mean that WordStar is overly complex and difficult to learn. WordStar is a visual system which you must experience "in the cockpit," i.e., seated at your terminal. Nevertheless, every phase of WordStar has been carefully documented, along with recommended procedures for getting the most out of its features.

To begin your WordStar experience, sit at a terminal, look at the menus, and note the convenient keyboard layout. Look at the range of functions, enter some text, and then try manipulating it by changing margins, substituting, and inserting. Read the manual, and try the operations on your terminal as you read. We hope you will enjoy WordStar as much as we've enjoyed putting it together.

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Section 1 Introduction

This section explains how to start WordStar and describes the commands available to you between editing tasks. The section covers everything you need to know before starting to enter documents with the editing function, as discussed in Section 2.

STARTING WORDSTAR

Prerequisites

Before you can call up WordStar, you must

- o Have a disk containing a copy of WordStar "installed" to work with your terminal and printer. The installed WordStar consists of three files (described in the **General Information Manual**):

WS.COM (or other name chosen during installation)

WSMSG.S.OVR

WSOVL1.OVR

If you or another person have not yet installed WordStar to work on your system, see the **Installation Manual**.

- o Know how to turn on your computer and "boot" (cold-start) your operating system. Since these procedures depend on the computer and the operating system, you will have to refer to other manuals.

To start WordStar, first boot your operating system. When the operating system is ready, it will display a prompt. The operating system will also display this prompt any time you exit from Wordstar or after completing execution of a system command.

Calling Up WordStar

Once the system prompt appears, there are three ways to call up WordStar:

BASIC METHOD

At the system prompt type

WS RETURN

This starts WordStar with no file being edited; a copyright message appears for several seconds, then the no-file menu (as described below) is displayed. Example (you type underlined text):

WS RETURN

This basic method is sufficient for initial use; you may defer reading about the other two methods for now.

DIRECTLY TO EDITING

Type WS, a space, and the name of the file, including disk drive as appropriate. WordStar will proceed to editing this file, as though the "edit a document" command had been given from the no-file menu as described below. Examples (you type underlined text):

WS LETTER.DOC RETURN

WS B:ABC.XYX RETURN

DIRECTLY TO EDITING ON ANOTHER DISK DRIVE

This method is for extremely long files, where the new file must be placed on a different disk because of space limitations. Type WS, a space, the source disk drive name, the name of the file, another space, and the target disk drive name. (If the file is on the currently logged disk, the source disk drive name may be omitted.) A disk drive name, if used, consists of a letter followed by a colon. Make sure you don't type anything after the target disk drive name, not even a space. Example (you type underlined text):

WS A:BOOK.DOC B: RETURN

This means, "Edit file BOOK.DOC on disk A and place the new version on file BOOK.DOC on disk B." When the save is completed, the file on disk A will have been renamed BOOK.BAK, while the file on disk B will now be called BOOK.DOC. If you use a "save and resume" command (^KS), the next editing session will result in a save from B to A, the following session from A to B again, and so on.

Note

If, when you call up WordStar, you get the message

You are trying to run an unINSTALLED WordStar.
Please run INSTALL first.

then your WordStar has not yet been installed to work with your terminal and printer. Refer to the **Installation Manual** for information on installation.

THE NO-FILE COMMANDS

When started without a file name, or whenever editing of a file is terminated, WordStar displays the "no-file menu". The words "editing no file" are displayed at the top of the screen, and a "menu" of commands that may be entered is shown. Below the menu, WordStar displays the directory (the names of all files on the disk) of the logged disk if the file directory display is ON. Figure 1-1 shows a typical screen display with the no-file menu:

```

          <<< NO - FILE MENU >>>
-----Preliminary Commands----- | -----File Commands----- | -----System Commands-----
L Change logged disk drive         | P Print a file              | R Run a program
F File directory off (ON)          |                             | X EXIT to system
H Set help level                   |                             |
-----Commands to open a file----- | E RENAME a file            | -----WordStar Options-----
D Open a document file             | O COPY a file              | M Run MailMerge
N Open a non-document file         | Y DELETE a file           | S Run SpellStar

```

DIRECTORY of disk A:

```

CHAPTR1.DOC  CHAPTR1.BAK  CHAPTR2.DOC  CHAPTR2.BAK  CHAPTR3.DOC  CHAPTR3.BAK
CONTENTS.DOC CONTENTS.BAK FILE1.DOC    FILE1.BAK    FILE2.DOC    FILE2.BAK
LETTER.DOC   LETTER.BAK   TEXT1.DOC   TEXT1.BAK   TEXT2.DOC   TEXT2.BAK

```

Figure 1-1. Screen Showing No-file Menu

To perform one of the functions shown on the no-file menu, enter the single letter shown for that function. The letter may be entered in upper or lower case, or with the CTRL key depressed. Unrecognized characters are ignored. No RETURN or other key is used after the command letter. When a command is entered, the letter is displayed in the upper left hand corner of the screen and further action is taken depending on the command.

THE PRELIMINARY COMMANDS

Table 1-1 gives brief descriptions of the preliminary commands, followed by detailed descriptions in later paragraphs.

Table 1-1. Preliminary Commands

Command	Description
L	Change Logged Disk. Displays the name of the current logged disk and allows selection of a new logged disk. Use L to allow display of directory of a different disk, or for convenience before working with files on a different disk.
F	File Directory Toggle. Controls display of file directory (names of all files on logged disk). The first F command turns the directory display off, the second F turns the directory display on again, etc. To display the directory of a different disk, change the logged disk with the L command.
H	Set Help Level. Asks for the new "help level" (0 to 3), which determines the degree of menu display and other prompting supplied by WordStar. Unless the help level is already 0, an explanation of the help levels is displayed.

Change Logged Disk Drive (the L Command)

The L command allows changing the logged disk drive. (The "logged disk drive" was explained in the **General Information Manual**). Typing an L at the no-file menu changes the screen display to the display shown in Figure 1-2 (at help level 3):

L editing no file

The **LOGGED DISK** (or **Current Disk** or **Default Disk**) is the disk drive used for files except those files for which you enter a disk drive name as part of the file name. WordStar displays the **File Directory** of the **Logged Disk**.

THE LOGGED DISK DRIVE IS NOW A:

NEW LOGGED DISK DRIVE (letter, colon, RETURN)? █

DIRECTORY of disk A:

CHAPTR1.DOC	CHAPTR1.BAK	CHAPTR2.DOC	CHAPTR2.BAK
CONTENTS	FILE1.DOC	FILE1.BAK	FILE2.DOC
LETTER.DOC	LETTER.BAK	MAILMRGE.OVR	TEST.DOC

Figure 1-2. L Command Display

To log a different disk drive, type the letter (A or B), an optional colon, and RETURN (C, D, etc. are also acceptable if you have more disk drives). To leave the logged disk drive unchanged, type ^U, or just press RETURN.

File Directory Toggle (the F Command)

The F command turns the file directory display off and on. The first F entered turns the directory display off, the next F restores it, etc. No additional information need be entered, and no screen changes take place. However, when directory display is off, the no-file menu item for F changes to read

F=File directory on (OFF)

To display the directory of a different disk, change the logged disk with the L command (next example). To cause the directory on the screen to be updated after putting a new disk in a drive, re-log the same disk drive with the L command, or press F twice.

Set the Help Level (the H Command)

The **help level** setting controls the amount of explanatory material automatically displayed by WordStar, and determines whether and when part of the screen is used while editing to display a "menu" of command keys which may be entered.

The help level is initially set to 3, the most helpful level. As you gain experience with WordStar, you will want to reduce the help level in order to have more of the screen available for file display.

The help level is changed with either the **H** command on the no-file menu (above) or with the **^JH** command (Section 2) while editing a file. Either command displays an explanation of help levels and current help level, and requests a new help level, as shown in Figure 1-3.

H editing no file

HELP LEVELS

- 3 all menus and explanations displayed
- 2 main editing menu (1-control-char commands) suppressed
- 1 prefix menus (2-character commands) also suppressed
- 0 command explanations (including this) also suppressed

CURRENT HELP LEVEL IS 3

ENTER Space OR NEW HELP LEVEL (0, 1, 2, OR 3): ■

partial DIRECTORY of disk A: ^Z=scroll up
 CHAPTR1.DOC CHAPTR1.BAK CHAPTR2.DOC CHAPTR2.BAK
 CONTENTS FILE1.DOC FILE1.BAK FILE2.DOC
 LETTER.DOC LETTER.BAK TEST.DOC

Figure 1-3. Help Level Command Display

The help level question takes a single-key response--no RETURN is needed. Pressing any key other than 0, 1, 2, or 3 leaves the help level unchanged.

Note

If you enter a digit (or press any key) before the explanation displays, some or all of the explanation will be omitted. This provides rapid response for the user who knows what he wants and types, for example, "H2".

The differences between help levels 3, 2, and 1 are seen primarily when editing a file, as noted in Section 2. Level 0 differs from the higher levels in that extra explanations associated with several commands are skipped. The explanations omitted at help level 0 include, for example, the explanation of the logged disk drive for the L command (Figure 1-2), and the explanations displayed by the D command (Figure 1-4).

The two lines which remind you of the control characters which may be used while answering any question whose prompt ends in a question mark,

^S=delete character ^Y=delete entry ^F=File directory
^D=restore character ^R=Restore entry ^U=cancel command

These prompts are displayed above such questions only at help level 2 or 3; but the keys work at all help levels, even if the prompts do not appear.

Messages like the two-line prompt above are displayed automatically—provided that a high enough help level has been set. But you may also call up other, longer messages to explain such things as setting the help level, entering text with WordStar, reforming a paragraph, reading the screen flags, using print control characters and dot commands, setting margins and tabs, setting place markers, and moving text. (See the "Help Menu" in Section 2 for more.)

THE COMMANDS USED TO OPEN A FILE

Table 1-2 gives brief descriptions of the commands used to open a file, followed by detailed descriptions in later paragraphs.

Table 1-2. Commands to Open a File

Command	Description
D	Open a Document File. Asks for a file name, then initiates editing of the specified file. The file specified may be an existing file or a new file.
N	Open a Non-Document File. Same as D except that the file is edited as a non-document, without dynamic pagination and with different defaults. Use D, not N, for normal WordStar word-processing (see Section 6).

Open a Document (the D Command)

With the no-file menu on the screen as shown in Figure 1-1, type **D** (or **d** or **^D**) to begin editing a file. WordStar then displays an explanation and a request to enter the file name as follows:

D editing no file

Use this command to create a new document file,
or to initiate alteration of an existing document file.

A file name is 1 to 8 letters/digits, a period,
and an optional 1-3 character type.

File name may be preceded by disk drive letter A-D
and colon, otherwise current logged disk is used.

^S=delete character **^Y**=delete entry **^F**=File directory
^D=restore character **^R**=Restore entry **^U**=cancel command

NAME OF FILE TO EDIT? █

```
partial DIRECTORY of disk A: ^Z=scroll up
CHAPTR1.DOC  CHAPTR1.BAK  CHAPTR2.DOC  CHAPTR2.BAK
CONTENTS    FILE1.DOC   FILE1.BAK   FILE2.DOC
```

Figure 1-4. D Command Display

You may then type the desired file name, followed by a carriage return (see the **General Information Manual**). The form of a file name is summarized on the screen as a reminder. For example, you might type

LETTER.DOC RETURN

to edit file LETTER.DOC on the logged disk, or

B:LETTER.DOC RETURN

to edit the file LETTER.DOC on disk B.

To edit the file BOOK.DOC on disk A and place the new version of BOOK.DOC on disk B, type:

A:BOOK.DOC B: RETURN

After the carriage return, WordStar proceeds to editing the file, as described in Section 2. You may then enter text into the document and use WordStar's editing commands. If the file does not exist, NEW FILE is displayed for several seconds. If the NEW FILE message appears when you intended to edit an existing file, you probably typed the name wrong or have the wrong disk in the disk drive. Abandon the edit (^KQ) to get back to the no-file menu.

Note

If the "help level" is zero, the explanatory material shown in Figure 1-4 is omitted from the screen display; only the question "NAME OF FILE TO EDIT" will appear. If you start typing the file name before display of the explanatory material, WordStar will omit some or all of the explanation.

Partial Directory Display

In an example above (Figure 1-3), the screen shows only part of the disk directory, as indicated by the word "partial". Partial directory display occurs whenever there are more file names than will fit on your screen. To view additional file names, use CTRL Z to move (scroll) the file directory display up a line, or CTRL W to move the file directory display down a line. Reminders about these control characters--"^Z=scroll up" and "^W=scroll down"--appear in the line above the directory whenever these characters can be entered and will bring more file names onto the screen.

QUESTION RESPONSES

Many WordStar commands ask the user questions for additional information. Some questions accept single-character answers; others accept a line of input terminated by carriage return. Each class has a number of common characteristics which we will describe here. In all cases, the "interrupt" character, ^U, may be typed to abort the command asking the question.

One-Character Answers

Questions that expect a one-character answer can be recognized by the fact that the prompt ends in a colon. These questions accept the next key pressed

as the response without waiting for RETURN to be typed. An example of such response is elicited by the "set help level" command question (see above).

Yes-No Questions

Some questions expect a yes-no answer; these have prompts of the form "... (Y/N): ." These questions accept Y, y, or ^Y (control-Y) as "yes" and any other key as "no". You are free to use the RETURN key, the space bar, or any handy key to indicate a "no" response. An example of such a question is the "REPLACE (Y/N):" question asked by the replace command (Section 5).

Line-Input Questions

These questions have prompts ending in "?". They include all file name questions (as from the D and P commands), the margin and tab stop column questions, and several others. When answering a line-input question, typing errors can be corrected; the previous response to the same question, or a portion thereof, can be restored without reentry. The file directory can be displayed and scrolled at will.

The answer to a line-input question can be terminated with the RETURN, LINE FEED, or ESCAPE keys. The ESCAPE key has a special meaning in the Print (P or ^KP), Find (^QF), and Replace (^QA) questions: it suppresses following options questions; for the margin and tab stop questions (^OL, ^OR, ^OI, and ^ON) ESCAPE means to use the cursor column (as shown in the status line), whereas RETURN means to abandon the command. In other cases ESCAPE is equivalent to RETURN. LINE FEED is always equivalent to RETURN.

When answering a line input question, you can correct typing errors (before the RETURN key is pressed), display the directory, and do other things with the special characters shown in Table 1-3. Note that ^X means control-X -- hold the CTRL key down while typing x.

At help levels 2 and 3, the following reminder of the more common special characters appears above most line-input questions; the special characters are valid at all help levels and at all questions whose prompt ends in "?".

^S=delete character ^Y=delete entry ^F=File directory
^D=restore character ^R=Restore entry ^U=cancel

Table 1-3. Special Characters for Responses

<u>Character</u>	<u>Function</u>
^Y	Erase Entire Answer. (You may also use ^X.)
^S	Erase One Character. (You may also use ^H, BACKSPACE, or DELETE.)
^D	Cursor Right. Unerase one character: one character is restored from a previously erased answer or from the answer given the last time the specific question was asked.
^R	Unerase. Restore an entire erased answer or a previous answer. To use the same response as last time (e.g., if you want to print a second copy of the same file), just type ^R and press RETURN.

Table 1-3. Special Characters for Responses (Continued)

<u>Character</u>	<u>Function</u>
^F	Display File Directory. Display the file directory of the logged disk for the duration of the current command. ^F does nothing if the directory is already on the screen.
^Z	Scroll Directory Up. If only part of the file directory is displayed, scroll the file directory up to bring additional file names into view.
^W	Scroll Directory Down. If only part of the file directory is displayed, scroll the file directory down to bring additional file names into view.
^P	Use Next Key. Use the next key pressed literally as part of the answer, even if it is a control character that normally has a special function, or one of the terminating characters. USE ^P- to enter a "hard" hyphen (regular -) even if soft hyphen entry (^OE) is ON. (See Section 4 for definitions of hard and soft hyphens.)
-	Enter Soft Hyphen. Enters a "soft hyphen" if soft hyphen entry has been turned ON (^OE; Section 4). Permits using soft hyphens in the "Find" and "Replace" commands. Use ^P- to force entry of a hard hyphen.
^U	Interrupt. Interrupts and terminates the command in progress; clears any commands or text already typed.

THE FILE COMMANDS

Table 1-4 gives brief descriptions of the file commands, with detailed descriptions of some commands in later paragraphs.

Table 1-4. File Commands

<u>Command</u>	<u>Description</u>
P	Print a File. The P command is used initially to start printing a document. However, once printing has started, pressing P a second time suspends printing ; and once printing has been suspended, pressing P a third time continues printing . The P line in the menu changes as appropriate. Detailed descriptions of the three uses of the P command are given in Sections 7 and 8.
E	Rename a File. The E command allows you to change the name of a file.
O	Copy a File. The O command allows you to make a copy of a specified file without having to use the system copy utility. You may copy files from or to different disks as long as both disks are on-line at the same time.

Table 1-4. File Commands (Continued)

Command	Description
M	Run MailMerge. Before you can use the MailMerge feature of WordStar, the MAILMRGE.OVR file must be present on disk drive A or on the logged disk drive. The M command allows merging data from a data file into text at print time for production of form letters, and performs other enhanced print functions. IF MAILMRGE.OVR is not present, an error message will be displayed. (The MAILMRGE.OVR file is provided separately.) See Sections 9-12 for details.
S	Check Spelling. In order to run this WordStar feature, you must have the SPELSTAR.OVR file on the disk that contains WS.COM, WSOVL1.OVR, and WSMGS.OVR. The SPELSTAR.DCT file may be on either of your disks. The S command allows you to run WordStar's spelling program (SpellStar) to check for spelling errors. If SPELSTAR.OVR is not present, an error message will be displayed. (The SPELSTAR.OVR file is provided separately.) See Section 13 for details.
Y	Delete a File. Asks for file name, then erases the file.

Check Spelling (the S Command)

With the No-file menu (Figure 1-1) on the screen, type S to begin a spelling check on a file, or to perform dictionary maintenance operations. The screen display then changes to the display shown in Figure 1-5 (at help level 3):

S	editing no file
For spelling check, enter name of file to be checked. (^R for last file edited)	
For dictionary maintenance, enter name of file containing words to add or to delete from dictionary.	
^S=delete character	^Y=delete entry
^D=restore character	^R=Restore entry
^F=File directory	^U=cancel command
NAME OF FILE TO CHECK / ADD TO DICTIONARY? █	
DIRECTORY of disk A:	
CHAPTR1.DOC	CHAPTR1.BAK
SPELSTAR.OVR	SPELSTAR.DCT
LETTER.DOC	LETTER.BAK
CHAPTR2.DOC	CHAPTR2.BAK
FILE1.DOC	FILE2.DOC
MAILMRGE.OVR	TEST.DOC

Figure 1-5. S Command Display

The S command is used to check a file with WordStar's new spelling program, SpellStar. For a detailed description of SpellStar, see Section 13.

Rename a File (the E Command)

The E command allows you to rename files without having to exit from WordStar. When you type E, the screen changes to the display shown in Figure 1-6 (at help level 3):

```

E           editing no file

^S=delete character  ^Y=delete entry   ^F=File directory
^D=restore character  ^R=Restore entry   ^U=cancel command

NAME OF FILE TO RENAME? █

DIRECTORY of disk A:
CHAPTR1.DOC  CHAPTR1.BAK  CHAPTR2.DOC  CHAPTR2.BAK
CONTENTS    FILE1.DOC   FILE1.BAK   FILE2.DOC
LETTER.DOC  LETTER.BAK  MAILMRGE.OVR TEST.DOC

```

Figure 1-6. E Command Display

You may rename a file on another disk by specifying the disk before the name of the file to be renamed (e.g. B:FILENAME.TXT). The **NEW NAME?** prompt is displayed after the name of the file to be renamed has been entered.

Copy a File (the O Command)

The O command allows you to copy files without exiting from WordStar. When you type O, the screen display (at help level 3) changes to the display shown in Figure 1-7. (The second prompt appears after user's response to first.)

```

O           editing no file

^S=delete character  ^Y=delete entry   ^F=File directory
^D=restore character  ^R=Restore entry   ^U=cancel command

NAME OF FILE TO COPY FROM? █
NAME OF FILE TO COPY TO ?

DIRECTORY of disk A:
CHAPTR1.DOC  CHAPTR1.BAK  CHAPTR2.DOC  CHAPTR2.BAK
CONTENTS    FILE1.DOC   FILE1.BAK   FILE2.DOC
LETTER.DOC  LETTER.BAK  MAILMRGE.OVR TEST.DOC

```

Figure 1-7. O Command Display

If the name of an existing file is entered as the file to copy to, WordStar displays the prompt:

```
FILE d:filename EXISTS -- OVERWRITE? (Y/N): █
```

Press Y (or y or ^Y) to proceed with the copy, destroying the present contents of file you are copying to. Pressing any other key will cause the NAME OF FILE TO COPY TO? question to be reasked; press RETURN or ^U to abort the copy command.

You may copy files from and/or to disks other than the logged disk by specifying a disk drive before the file name (e.g. B:FILENAME.TXT). The exact file name to be copied must be entered; you may only copy one file at a time.

Delete a File (the Y Command)

With the no-file menu (Figure 1-1) on the screen, type Y to initiate deletion of a file. The screen display then changes to the display shown in Figure 1-8 (at help level 3):

```

Y      editing no file

^S=delete character  ^Y=delete entry    ^F=File directory
^D=restore character  ^R=Restore entry   ^U=cancel command

NAME OF FILE TO DELETE? █

DIRECTORY of disk A:
CHAPTR1.DOC  CHAPTR1.BAK  CHAPTR2.DOC  CHAPTR2.BAK
CONTENTS    FILE1.DOC   FILE1.BAK   FILE2.DOC
LETTER.DOC  LETTER.BAK  MAILMRGE.OVR TEST.DOC

```

Figure 1-8. Y Command Display

Enter the name of the file to delete, followed by RETURN. The form of a file name and use of control characters to correct typing errors, is the same as for the D command (previous example).

After the file is erased, the no-file menu reappears on the screen and another command may be entered. If you enter a Y, then decide not to delete a file, you may cancel the command with ^U, or by pressing RETURN only.

THE SYSTEM COMMANDS

Table 1-5 gives brief descriptions of the system commands, followed by detailed descriptions in later paragraphs.

Table 1-5. System Commands

<u>Command</u>	<u>Description</u>
R	Run a Program. The R command allows you to run a program without exiting from WordStar. For example, the amount of disk space could be checked by using the system file status utility.
X	Exit to System. Exit to operating system. Use X when you are through with WordStar and wish to use a system command.

Run a Program (the R Command)

The R command allows you to run a different program without exiting from WordStar. This command is especially useful for determining the amount of available disc space by running the file status utility. When R is entered at the no-file menu, the prompt shown in Figure 1-8 is displayed (at help level 3):

R editing no file

Enter name of program you wish to Run,
optionally followed by appropriate arguments.

Example (shows disk space in CP/M): STAT

^S=delete character ^Y=delete entry ^F=File directory
^D=restore character ^R=Restore entry ^U=cancel command

COMMAND? █

DIRECTORY of disk A:

CHAPTR1.DOC	CHAPTR1.BAK	CHAPTR2.DOC	CHAPTR2.BAK
CONTENTS	FILE1.DOC	FILE1.BAK	FILE2.DOC
LETTER.DOC	LETTER.BAK	MAILMRGE.OVR	TEST.DOC

Figure 1-9. R Command Display

Enter the name of the program to be run and press RETURN. Only executable programs (file type .COM) should be specified. An attempt to Run a non-executable file may result in an error message, or may lock up your system making it necessary to re-boot. When the program has completed, the following prompt is displayed:

Hit any key to return to WordStar:

This allows you to view any results displayed by the program before returning to the WordStar no-file menu.

The R command will handle any operating system utility. File names or other arguments may follow the program name. For example:

STAT LETTER.DOC

shows the size of file LETTER.DOC on the logged disk of a CP/M system. Asterisks and question marks can be used to form "wild card" file names, as allowed by system commands. For example:

STAT B:*.DOC

shows the size of all files of type .DOC on disk B in a CP/M system. (*'s and ?'s are not allowed in file names entered in other WordStar commands.)

In order to use the R command, you must have WS.COM (or other name as specified during INSTALLation) on disk A or the current logged disk.

Exit to the System (the X Command)

The X command is used to exit to the operating system. When you type an X at the no-file menu, the operating system prompt appears at the bottom of the screen.

Section 2 Getting Acquainted with WordStar

WORKING WITH A DOCUMENT

This section provides an overview of document editing. Later sections focus on specific topics. Enough commands and general background are given in this section to allow you to enter and modify text.

For best results, turn on your computer, start WordStar and type D, followed by a filename to open a file. Then try each command as it is described here. A little experience will go a long way in familiarizing you with WordStar's power.

Opening a Document

To open a document, type D from the No-File Menu (Section 1). If this file is being opened for the first time, Wordstar will first display NEW FILE for a few seconds; if the file has been opened before, the NEW FILE message will be skipped.

WordStar then enters its file-editing state. For a new file and help level 3, the screen appears as follows:

```

A:TEST.DOC PAGE 1 LINE 1 COL 1          INSERT ON
      <<<  M A I N  M E N U  >>>
--Cursor Movement-- | -Delete- |  -Miscellaneous- |  -Other Menus-
^S char left ^D char right | ^G char | ^I Tab ^B Reform | (from Main only)
^A word left ^F word right | DEL chr lf | ^V INSERT ON/OFF | ^J Help ^K Block
^E line up ^X line down | ^T word rt | ^L Find/Replce again | ^Q Quick ^P Print
  --Scrolling-- | ^Y line | RETURN End paragraph | ^O Onscreen
^Z line up ^W line down | | ^N Insert a RETURN |
^C screen up ^R screen down | | ^U Stop a command |
L-----R
■
.
.
.
.
.
.
.

```

Figure 2-1. Screen Display for a New File

The top line is the **status line**. A:TEST.DOC is the name of the file being edited; the page, line, and column are those of the cursor position, and will change as you enter text or move the cursor.

The **main menu** occupies the next eight screen lines, assuming the help level is still set to 3. The menu provides a brief reminder of the functions of the different command keys. We will describe some of the functions in this section, with complete coverage in Sections 3-6. In the menu, as in this manual, the ^ symbol means to hold down the CTRL key while typing the key that follows.

The line below the menu is the **ruler line**:

```
L-----!-----!-----!-----!-----!-----!-----!-----!-----!-----!-----R
```

The L indicates the current left margin setting; R indicates the right margin, and !'s indicate where tab stops are set.

The menu and ruler line are "highlighted" on terminals with bright/dim or inverse video (black on white) capability to distinguish them from the document being edited.

The portion of the screen below the ruler line is the **text area**, where text from the document being edited is displayed. For a new file, the text area is initially blank; for an old file, the text area shows the first several lines of text.

Entering Text

To enter text, just start typing. Each non-control character typed is entered into the text of your document. If you type beyond the right margin, notice that **WordStar** moves the word that wouldn't fit inside the margin to the next line, positioning the cursor after the word to allow you to continue typing. This is **word wrap**. You will also notice that **WordStar** adds spaces between words to make the right margin line up. This is **justification**.

When entering text within a paragraph, don't use the **RETURN** key--let word wrap do the work. Section 4 describes commands to set the margins, disable justification, specify double spacing, etc., to control the appearance of text entered under word wrap.

To make a correction or addition, move the cursor to the desired position and type the new text.

Moving the Cursor

To move the cursor, use the cursor up, down, left, and right commands as shown on the menu. You will find the cursor left and right **word** commands faster than the cursor left and right **character** commands when you wish to move across a line. (Either ^H or the **BACKSPACE** key, if your terminal has one, may be used for moving the cursor left by character.)

When you type with the cursor on a character previously entered, you will notice that **Wordstar** inserts the new characters and pushes the old characters to the right. This is **insertion**. Insertion is initially ON. Insertion may be turned OFF, and back ON, by typing ^V. Characters typed with insertion OFF will **overtyp**e (replace) existing characters. The status line shows whether insertion is on.

Deleting Characters

After making a correction by backing up the cursor and typing the desired text, unwanted characters may remain at, and to the right of, the cursor. To delete these, use the ^G (delete character right) command. Each press of the ^G key deletes the character at the cursor, moving the following part of the line left one character. (Use ^T to delete all or part of a word.)

If you notice a typing error immediately, you may use the **DELETE** (or **RUBOUT** on some keyboards) key, then type the corrected text. Each press of the **DELETE** key deletes one character to the left of the cursor, moving the cursor left. Other deletion commands are shown on the menus and described in Section 3.

After you have made changes in a paragraph, the right margin may no longer be lined up. Some lines may be too short, others may be too long. There may be document lines which are so long that they extend beyond the right-hand edge of the screen.

Realigning the Right Margin

To realign the right margin of a paragraph entered under word wrap, use the reform command (^B), as follows: place the cursor in or above the first "messy" line and type ^B. **WordStar** will "reform" all the lines to the next place **RETURN** was pressed (as indicated by a < in the rightmost screen column).

While the paragraph reform command (^B) is working, it may encounter a long word that won't quite fit on a line and looks as though it can be hyphenated. When this occurs, **WordStar** will display an explanatory message and stop reforming to allow you to press the hyphen (-) key (if you wish to hyphenate the word at the cursor position), or to press ^B to continue reforming without hyphenating. This "Hyphen-Help" feature is described in detail in Section 4.

Reforming a long paragraph takes several seconds, during which "^B" appears in the upper left corner of the screen. The reformed text is displayed only after the reforming is complete or a word to hyphenate has been encountered.

Making Blank Lines

To insert a new paragraph, begin by pressing ^N to make one or more blank lines after the cursor. Then type the desired text. **Wordstar** will insert a new blank line automatically each time word wrap takes place.

Pausing for the System

When the screen is filled with text and the cursor is on the bottom line of the screen, the screen will start to **scroll** (roll) upward each time the cursor goes to a new line. If you type fast, the screen may not keep up, but when you pause, the display will be updated to reflect all characters typed.

Occasionally the word **WAIT** may appear in the status line, usually accompanied by an audible click from your disk drive. When this happens, stop typing or type slowly until **WAIT** disappears.

Page Breaks

When you have entered more text than will print on a page, a line of hyphens appears across the screen, with a P in the rightmost column, to show you where the page break will occur during printing:

-----P

This is **dynamic page break display**. In section 7 we will discuss the use of "dot commands" to specify places where you want a new page to begin even though the current page isn't full, and to specify formatting items such as the number of lines printed on a page.

Examining Text

To look at text which is currently not on the screen, use the "scroll up line", "scroll down line", "scroll up screenful", and "scroll down screenful" commands shown on the menu to bring the desired text into view. Also, "cursor down" with the cursor already at the bottom of the screen scrolls the screen up a line, and "cursor up" at the top scrolls it down.

Depending on the type of terminal you have, commands such as "scroll down line" may immediately move the screen down, or may redisplay all the text on the screen, taking a second or two. It is not necessary to wait for the previous command to complete to enter the next one. If you know you want to move the file display down five lines on the screen, type five ^W's rapidly. Each one will interrupt the redisplay started by the previous one; when the screen stops changing, text on the screen will have moved down five lines, with five lines gone off the bottom and five previously not visible lines displayed at the top.

You will notice that the behavior of the editing commands reflects the way characters are stored in the file. For example, if you keep moving the cursor "right", after getting to the end of the line it will move to the left end of the next line down on the screen. This is because the file contains the characters of a line, in left-to-right order, then a "carriage return" character, then the characters of the next line; the carriage return is between the rightmost character of one line and the leftmost character of the next.

If you move the cursor as far right as it will go without moving to the next line, then give a "delete character right" (^G) command, the carriage return will be deleted, joining the next screen line onto the end of the one the cursor is on. Generally, carriage returns can be edited like other characters.

USING THE MENUS

WordStar has far more commands than there are control keys. Hence, many commands require two-character sequences. The first character, referred to as the **prefix key**, selects one of five additional menus. All two-character commands begin with ^Q, ^J, ^K, ^O or ^P; these five prefix keys are listed in the right-hand column of the main menu for ready reference.

The Onscreen Menu

The **Onscreen Menu** contains commands that allow you to set double spacing, change margins and tab stops, disable word wrap, and perform other functions related to on-screen document formatting:

```

^O      A:TEST.DOC  PAGE 1 LINE 1 COL 1          INSERT ON
          <<<  O N S C R E E N  M E N U  >>>
-Margins & Tabs- | -Line Functions- | -More Toggles- | -Other Menus-
L Set left margin | C Center text      | J Justify off (ON) | (from Main only)
R Set right margin | S Set line spacing | V Vari-Tabs off (ON) | ^J Help ^K Block
X Release margins  |                    | H Hyph-help off (ON) | ^Q Quick ^P Print
I Set N Clear tab  | -Toggles-        | E Soft hyph on (OFF) | ^O Onscreen
G Paragraph tab    | W Wrđ wrap off (ON) | D Prnt disp off (ON) | Space Bar returns
F Ruler from line  | T Rlr line off (ON) | P Pge break off (ON) | you to Main Menu.
L-----|-----|-----|-----|-----|-----|-----|-----|-----R
█
    
```

Figure 2-4. The Onscreen Menu

In addition, the Onscreen Menu shows whether word wrap, justification, and other features are currently ON or OFF. In the above example, all toggles are ON except for the Soft Hyphen, which is OFF.

The Print Menu

The **Print Menu** is used for entering print control characters (described in the **General Information Manual** and in Section 7 of this manual):

```

^P      A:TEST.DOC  PAGE 1 LINE 1 COL 1          INSERT ON
          <<<  P R I N T  M E N U  >>>
----- Special Effects ----- | -Printing Changes- | -Other Menus-
(begin and end) | (one time each)   | A Alternate pitch   | (from Main only)
B Bold D Double  | H Overprint char   | N Standard pitch    | ^J Help ^K Block
S Underscore     | O Non-break space  | C Printing pause    | ^Q Quick ^P Print
X Strikeout      | F Phantom space    | Y Other ribbon color | ^O Onscreen
V Subscript      | G Phantom rubout   | -User Patches-    | Space Bar returns
T Superscript    | RET Overprint line | Q(1) W(2) E(3) R(4) | you to Main Menu.
L-----|-----|-----|-----|-----|-----|-----|-----R
█
    
```

Figure 2-5. The Print Menu

The Help Menu

To complete the menu presentations, the **Help Menu** shows commands for controlling help levels and displaying reference information and learning aids:

```

^J      A:TEST.DOC  PAGE 1 LINE 1 COL 1                INSERT ON
          <<<      H E L P  M E N U                >>>
          |
H Display & set the help level | S Status line | | Other Menus
          | | (from Main only)
B Paragraph reform (CONTROL-B) | R Ruler line | | ^J Help ^K Block
          | | ^Q Quick ^P Print
F Flags in right-most column  | M Margins & Tabs | | ^O Onscreen
          | | Space Bar returns
D Dot commands, print controls | P Place markers | | you to Main Menu.
          | |
I Index of commands           | V Moving text  | |
          | |
L-----|-----|-----|-----|-----|-----|-----|-----R
          |
          ■

```

Figure 2-6. The Help Menu

^JH displays, explains, and sets the help level, in the same manner as the H command on the no-file menu, Section 1. The rest of the commands display explanations. For example, ^JV explains how to move a block of text, ^JI helps find commands for various functions, and ^JD summarizes the ordinary dots commands. Some of these help commands display several screens of information; WordStar awaits a keystroke between screens.

Help Levels

As you gain experience using WordStar, you will learn the commands, and you will want to see more of your document on the screen instead of the menus. If you change the help level (discussed in Section 1) from 3 to 2 with the ^JH command, the main menu will not display. The prefix menus will appear whenever you type a prefix key if you pause before hitting another key. If you change the help level to 1, the prefix menus will also be completely eliminated. Further changing the help level to 0 eliminates explanations displayed by various individual commands, such as the no-file D command or the help level command (Section 1).

THE SCREEN DISPLAY

The screen display during editing consists of the status line, the menu, the file directory (if enabled), the ruler line, and the file display area. The file display area shows text from the file being edited plus "flag" characters in the rightmost column. The file display is updated only when WordStar has completed all commands which have been entered.

The Status Line

During editing, the status line on the top line of the screen usually shows the following items:

- o The command being entered or executed, if any
- o The name of the file being edited
- o PAGE number
- o LINE number
- o COLUMN number
- o INSERT ON (if insertion is on)
- o plus other phrases as applicable

The **file name** will disappear if necessary in order to allow all of the additional status line information to fit on the screen line.

The **command in progress**, if any, is shown in the upper left corner as the characters typed to invoke the function. If only the first (prefix) key of a two-key command has been entered, this character will display. If you type several commands ahead, they will display in sequence as executed. Exception: fast single-key commands, such as "cursor down line", do not display.

DOCUMENT DISPLAY

The next three status line items are normally these:

PAGE pp LINE ll COL cc

These are the print page number, print line number on the page, and print column number of the character at the cursor. They are continuously updated as the cursor is moved.

The **PAGE** is the printout page number, assuming that the document is printed with page numbers running up from 1. If different printout page numbers are specified (by "dot commands" described later), these numbers will not be reflected in the status line.

The **LINE** is the printout line; and does not count dot command lines (which control printout).

The **PAGE** and **LINE** will not correspond exactly to the printout in certain cases of dot command use (e.g., if the paper length (.PL dot command) is changed in mid-document). See "Dynamic Page Break Display" in the **General Information Manual**.

The **COLUMN** is the **print** column, not the screen column. The print column differs from the screen column when the line contains a non-printing character such as print control character (e.g., ^S to invoke underlining), or when a marker (described in Section 6) is shown in the display line.

NON-DOCUMENT DISPLAY

If you initiate editing with the non-document command N (Section 6) or if page break display has been suppressed (^OP command, Section 4), then the page and line are replaced with:

FC=cccc FL=llll

FC=cccc gives the file character number, or the number of characters between the cursor and the beginning of the file, plus 1. This counts all characters (bytes) stored in the file, including carriage returns, line feeds, etc.

FL=llll gives the file line number, or the number of file lines (including dot command lines) between the cursor and the beginning of the file, plus 1.

Thus, when this type of status line is displayed, you can determine the size of the file in characters by moving the cursor to the end of file (^QC) and reading the FC=cccc item.

OTHER ITEMS

The remaining items in the status line are phrases which display under the conditions indicated:

WAIT	Shows when WordStar is reading or writing to the disk. When this appears, stop typing, or type very slowly; otherwise characters you type may be missed.
MAR REL	Shows when margins are released (^OX command, Section 4).
decimal	Shows after tabbing to a decimal tab stop, as long as the decimal right-aligning action is in effect, as described in Section 4.
INSERT ON	Shows when insertion is on, that is, when typed characters are inserted into the file rather than typed over other characters in the file. Insertion is turned on and off by typing ^V.
LINE SPACING n	Shows except when single-spacing is in effect. The line spacing can be set with the ^OS command, Section 4.
PRINT PAUSED	Shows when printing of a file is suspended--after being stopped by user command, when stopped at a "pause for typewheel change" print control character (Section 7), or when a page has been completed under the PAUSE BETWEEN PAGES option (Section 8).
REPLACE (Y/N):	This question is displayed in the status line by the replace command (Section 5).

Note

When several of the above phrases appear at once, it is normal for the LINE SPACING item to disappear off the right edge of the screen.

The Menu

A menu of editing commands may appear below the status line as described and illustrated earlier in this section.

The main menu, showing single-control-character (non-prefix) editing commands, displays at the default help level, level 3 (Section 1). When the help level is 2 or 3 and a prefix key (as shown on the main menu) is pressed, after a short pause, the command menu for that prefix is displayed. The menus, as well as the status line and ruler line, are displayed highlighted (in inverse video or dim display, when available) for differentiation from file text. When no menu is on display, more of the screen is available for file text display.

A number of explanatory and warning messages display above or below the menu under certain conditions. For example:

```
TYPE ^KP TO CONTINUE PRINT
      (explanation; appears during print pause)
```

```
*** WARNING: WORD TOO LONG TO FIT MARGINS
```

```
(warning; occurs when an overlong line with no spaces or
other possible word wrap points is entered or reformed)
```

Most such messages are cleared at the next keystroke. Messages and the conditions which cause them are described in Appendix B.

The File Directory

Normally, the file directory is not displayed during editing. However, the ^KF command may be used to invoke directory display during editing if desired. (Also, a temporary file directory display may be invoked by typing control-F while entering a file name). When enabled during editing, the directory appears between the menu and the ruler.

Usually while a file is being edited, WordStar will only display a partial directory to leave more screen space for file display. The ^Z and ^W commands on the main editing menu will scroll the directory up and down in order to allow viewing of all file names. (When the directory is not displayed, or when there are no more directory lines to scroll onto the screen, these commands scroll the file display.)

WordStar normally displays the file directory in alphabetical order and sorts files by type. .BAK files follow the corresponding parent file. Non-text files with extensions such as .COM and .INT and temporary files recognized by .\$\$\$ are displayed at the end of the directory.

If a system does not have enough memory or the file directory is unusually long (more than about 64 filenames of average length), WordStar will display

an unsorted directory. Long directories display and scroll more slowly than those of moderate size.

The file directory (and occasionally the ruler) will disappear temporarily when the menu, or questions evoked by various commands, or other messages use too many screen lines. Users with 16-line screens will observe this disappearance most often. The directory will reappear as soon as screen space permits.

The Ruler Line

Below the menu and file directory (when present), the highlighted ruler line

```
L——!——!——!——!——!——!——!——!——!——!——!——!——R
```

shows the current left margin (L), right margin (R), and variable tab stops (!). Decimal tabs (Section 4) will show as #'s. Non-tab columns between the margins display as hyphens. If the L or R setting occurs at a tab column, the ! or # will be shown.

If the left margin is temporarily moved in with the paragraph tab command (^OG, Section 4), the L does not move, but the portion of the ruler outside the temporary margin is displayed without highlighting.

Tab stops set outside the margins are active, and show as !'s or #'s, only when the margins are released (^OX command, Section 4) or word wrap is off (^OW, Section 4). If the right margin is set wider than the screen, text beyond column 79 can be viewed by moving the cursor past the rightmost column. The ruler line display can be eliminated and restored with the ^OT command, Section 4. If the ruler display is turned off while the file directory display is turned on, WordStar uses a highlighted line of equal signs (=) to separate the directory display from the file display.

The Text Area

The rest of the screen displays lines of text from the document being edited. The portion of the document displayed always includes the cursor position in the file, so that the screen cursor can correspond to the the file cursor.

All columns of the screen except the rightmost are used to display text. For example, on an 80-column screen, at most 79 columns of text will appear on a line. The rightmost column of the screen is blank or displays a "flag" character to indicate a special type of line or a "hard" carriage return, as explained in the following paragraphs.

EXCEPTIONAL LINES

Each line in the file display area shows what will usually print on one line of the document; exceptions include the following:

Continuation Lines

If a line is too long to be displayed on one screen line (79 columns for an 80-column screen), WordStar will display as much of the line as the screen will allow. That portion of the line that is beyond column 80 may be brought into view by moving the cursor past column 79. When the cursor is past column

79 (and the continuation line is on-screen), the column number shown in the status line still reflects the print column, not the screen column now occupied by the cursor.

Overprint Lines

For special effects, it is possible to have two or more consecutive lines which print over each other, so that two different characters can be printed in the same position to form a special graphic. On the screen, a hyphen (-) in the rightmost column (i.e., the "flag" column) indicates that the next screen line will print over the line so flagged. To terminate a line to be overprinted, type ^P and press RETURN to enter a carriage return without line feed, as described in Section 4.

Page Break Lines

The dynamic page break display feature shows a line of -'s, with a P in the rightmost column, at places where a page break will fall during printout:

-----P

This line is **added** only for display purposes; there is no such line in the document. (If the page break is caused by a "form feed" (^L) character in the file, then the form feed (and the characters preceding it, if any) are shown on the screen line, with hyphens to their right.) The display of page break lines can be turned off, and back on, with the ^OP command.

End-of-File Lines

When the document ends before the bottom of the screen, the remainder of the screen displays blank lines with periods in the rightmost (flag) column. For a new file, the screen is initially filled with such lines.

Beginning-of-File Lines

If the file display is moved down on the screen until the beginning of the file is below the top of the display area, the portion of the screen above the beginning of the file is filled with blank lines with colons (:) in the rightmost column.

Ordinary Lines

Ordinary lines in the file display area show lines of text from the file that are **not** longer than the screen line and are **not** overprinted by the next line. Such lines can end in a "hard" or a "soft" carriage return, as described in the **General Information Manual**; the hard carriage return is indicated with a < flag, and the soft carriage return with a blank flag.

The following example shows the screen's appearance after entering two paragraphs and a list, illustrating the display of hard and soft carriage returns. No menu is shown, indicating that the help level is set to 2 or less. The symbol ■ represents the cursor.

Flag Characters

Most of the "flag" characters which can appear in the rightmost column of the file display area were introduced earlier in this section; Table 2-2 summarizes all of them for reference.

Table 2-2. Flag Characters

<u>Character</u>	<u>Meaning</u>
	Blank. Line ends in "soft" (mid-paragraph) carriage return; this line break may be changed by subsequent word wrap or paragraph reform operations.
<	Line ends in "hard" carriage return; this line break will not change in subsequent word wrap or reform operations.
+	This line is continued beyond the rightmost column on the screen; an attempt to move the cursor to the right of the rightmost column will bring more of the line into view.
-	Next line will overprint this line.
.	This screen line is after (below) the end of the document. Also appears on last line of document if there is no carriage return after the text.
:	This screen line is before (above or prior to) the beginning of the document.
P	New page begins with following screen line. Appears only when page break display is on (^OP).
?	Line contains an unrecognized, and possibly erroneous, "dot command" (Section 7). Also appears while a dot command line is being typed in; disregard until entry is complete. Does not appear when editing a "non-document" (Section 6).
J	Line ends in "line feed" character without "carriage return" character. This is a non-standard file format never created in normal WordStar use.
M	Line contains a MailMerge dot command. See MailMerge (Sections 9-12).

Note

The flag character is not displayed on the last line of most terminals. Because of normal hardware limitations, this position is left blank. Scroll the display up a line (^Z) to see the flag column character for the last line.

Screen Updating

The file display area of the screen is updated at the end of each command, or after each character of text entered, provided that no further keys have been struck. Only the changed portions of the screen are redisplayed.

The file display is not updated until the command has been executed completely. For example, the cursor to end of file command (^QC) can take several seconds or longer, during which the screen remains unchanged, except that ^QC displays in the upper left hand corner and WAIT appears if necessary.

Screen update is further deferred until all characters typed have been processed, allowing WordStar to process commands and text entry typed at a much higher burst rate than the terminal display can keep up with. For example, if several "scroll up screenful" commands (^C) are typed quickly, the file display area remains unchanged until all of them have been processed. This allows rapid motion through the file.

If a character is typed while WordStar is in the midst of updating the screen, the update will be suspended until that character is processed, momentarily (or longer, if a slow command was entered) leaving the screen in a partially updated state.

EXCEPTION

The scroll up line (^Z) and scroll down line (^W) commands always display the new line scrolled onto the screen immediately. This makes possible rapid upward scrolling with all lines displayed, by holding down repeat CTRL Z. (On some keyboards, any key which is held down repeats; on others, there is a separate REPEAT key which should be held for repetitive transmission.) Similarly, repeat-control-W will scroll the text downward continuously on terminals capable of downward scrolling.

HINT

All terminals are capable of "scrolling" the text upward, but on those without the "line delete" code, WordStar will scroll instead of redisplay only if there is no menu above the file display area. Thus, users of "dumb" terminals will obtain faster upward scrolling (for example, with the ^Z command) if they suppress the menu by reducing the help level.

Section 3 Basic Editing

Sections 3-6 describe all of the commands that are available while editing a file. The descriptions are organized into categories to facilitate reference. The categories are organized in the approximate order a new user will need to learn commands. But this doesn't mean that all commands in a category should be learned before progressing to the next.

Each section includes concise tables of commands and most sections include additional descriptions. In particular, Section 4 contains extensive description of the use of WordStar's on-screen text formatting features.

The commands that are available when not editing a file (at the no-file menu) are described in Section 1.

CURSOR MOTION

Cursor motion commands are used to place the cursor at the desired point in the text before making a correction or addition. All scroll motion commands move the display of the document up or down on the screen, or display an entirely different screen of text as necessary to bring the cursor destination into view.

As noted at the end of this section, the cursor will not go to places on the screen that do not represent characters in the file.

Table 3-1 shows all of the commands relating to cursor motion. The second character of a two-key command is shown as an upper case letter, but it may also be entered as a lower case letter or a control character.

Note that the basic cursor motion keys (^S, ^E, ^D, and ^X) are arranged in a diamond on your keyboard. The position of the keys corresponds to the direction of cursor motion:

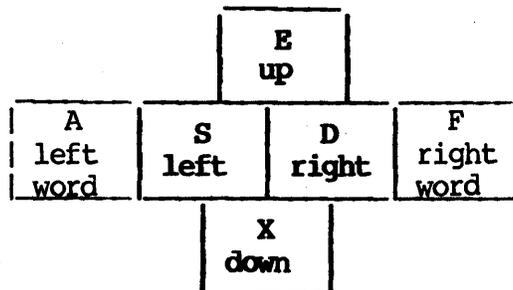


Figure 3-1. The Cursor Diamond

The adjacent keys to each side of the diamond, ^A and ^F, move the cursor farther in the same direction—to the next word instead of the next character.

Furthermore, prefixing any of the four basic diamond keys with ^Q moves the cursor as far as it will go on the screen in that direction.

Table 3-1. Cursor Motion Commands

<u>Command</u>	<u>Description</u>
^S	Cursor Left Character. Moves the cursor to the previous character in the file, going to the end of the preceding line if at the beginning of the current line. One common use of this command is to back-space over characters just entered to make a correction. (^H and BACKSPACE are equivalent to ^S).
^D	Cursor Right Character. Moves the cursor to the next character in the file, going to the beginning of the next line if at the end of the current line.
^E	Cursor Up Line. Moves the cursor up to the preceding screen line. The cursor remains as nearly as possible in the same print column; moves left if needed to avoid landing beyond the end of a line.
^X	Cursor Down Line. Moves the cursor down to the next screen line. The cursor remains as nearly as possible in the same print column; moves left if necessary to avoid landing beyond the end of a file line.
^A	Cursor Left Word. Moves the cursor back to the beginning of a word. See exact definition of "word" after this table.
^F	Cursor Right Word. Moves the cursor forward to the beginning of the next word. This is a fast way to get the cursor to the desired position in a line.
^QS	Cursor to Left Side. Moves the cursor to the leftmost column of the current screen line.
^QD	Cursor to Right Side. Moves the cursor right to the position after the last character displayed on the current screen line; usually this is not the right edge of the screen.
^QE	Cursor to Top. Moves the cursor to the top line of the text area, remaining as nearly as possible in the same column.
^QX	Cursor to Bottom. Moves the cursor to the bottom line of the text area (similar to ^QE).
^QR	Cursor to Beginning of File. Moves the cursor to the beginning of the document. For a long document, doing a save (^KS) is faster and uses less disk temporary file space if the cursor is currently near the end of the document.
^QC	Cursor to End of File. Moves the cursor to the position after the last character of the document.

Table 3-1. Cursor Motion Commands (Continued)

Command	Description
^Q0-9	Cursor to Place Marker. Moves the cursor to one of ten "place markers". Place markers are set by the operator with the commands ^K0 through ^K9 (see Section 5).
^QB	Cursor to Beginning of Block. Moves the cursor to the beginning of the marked block, and displays the marker if it is presently undisplayed. Blocks are described in Section 6.
^QK	Cursor to End of Block. Moves the cursor to the end of the currently marked block, similarly.
^QP	Cursor to Position Before Previous Command. Moves the cursor to its position before the preceding command. This command is particularly useful after saves, to get back to where you were editing, and after ^B (paragraph reform), to get back to the point where you were making changes.
^QV	Cursor to Start of Last Find. Cursor to Source of Last Block. Moves the cursor to its position before the last Find or Replace command (Section 5) or to the position of the source of the last block of text moved, copied, or deleted (Section 6), whichever has been used most recently.

Definition of a "Word"

For the purposes of the word left and word right commands (^A and ^F) and the delete word command (^T), a "word" is defined to include one punctuation character (. , : ; ! or ?) at the end, if present, and any number of following spaces and tabs. Words may be separated by commas (for example) without spaces, and the cursor will come to rest after each comma. A carriage return is also treated as though it were a word, that is, the cursor will stop at the end of each line as well as at the beginning of each word in each line.

Where the Cursor Won't Go

The cursor can be moved **only onto characters present in the file**, or to the position immediately after the last character of a file line. This latter position corresponds to being "on" the carriage return between lines. Recall that lines in the file are stored in variable length, with "carriage return" characters separating them. There is usually blank space on the screen to the right of each line for which the file contains no characters. The cursor cannot be moved into this space with the cursor motion commands.

To get the cursor to go beyond the actual characters at the right of the end of a line, the line must be extended. Put the cursor at the end of the line (^QD), then space or tab over to the desired column. If insertion is off, you can tab over without bothering with the ^QD. The tab key (^I) acts like a cursor motion command when the cursor is over existing characters, but extends the line with spaces upon reaching the end of the existing text.

Usually you will find that the cursor can be moved one or two more columns to the right of the last character visible on a line. This just means that there are one or two "space" characters in the file between the last visible character and the carriage return.

The cursor will not move beyond the position after the last character in the file, nor move to a position before the beginning of the file.

The cursor will not come to rest in "markers" (see Section 5), nor in page break display lines (-----P), as these are display items that do not represent file characters.

The cursor will come to rest only on the first display character of a file character displayed with multiple characters (see Section 2). This occurs with respect to print control characters entered into the file to control enhancements such as underline, and with the (non-document) fixed "tab" characters, if you use them (Section 6).

How the Cursor Moves

HORIZONTAL MOTION

"Horizontal" cursor motion follows the characters in the working document, wrapping to beginning (left) of the next line when moved to the right from the end of a line, or to the end (right) of the preceding line when moved to the left from the beginning of a line. For example, successive "cursor right" (^D) commands move the cursor to the right until the end of the line is reached, then the next ^D moves the cursor to the **beginning** of the next screen line, at the left edge of the screen.

Horizontal cursor motion moves extra positions as necessary to avoid landing in a place the cursor won't go, such as on the letter of a control character displayed as ^-letter, or on a display item that does not represent a file character, such as a marker or a page break line.

VERTICAL MOTION

Vertical cursor motion keeps the cursor in the same **print** column, or as near to it as possible. When the destination line is long enough, the cursor will usually move straight up or down, but it may jog left or right according to the "same print column" rule if one of the lines contains one or more print control characters. The print control characters, described in Section 7, display as a caret (^) and a letter (two columns), but don't print (or print in one column only).

If the cursor is moved up (^E) or down (^X) and the destination line is shorter, the cursor will move left as necessary to avoid landing beyond the end of the line. The cursor also moves sidewise, if necessary, to avoid landing in any of the other forbidden places previously described. Also it will move vertically an additional line to skip over a page break line.

ATTEMPTING TO MOVE OFF THE SCREEN

When a command moves the cursor to a character not displayed on the screen, the screen display is scrolled to bring the cursor destination onto the

screen. For example, if the cursor is already on the top display line, a "cursor up" (^E) will move the file display down a line in order to give the cursor a place to go. Or, if your right margin is greater than 79, and you attempt to move the cursor beyond column 79, the screen display will be scrolled horizontally. (See the discussion of horizontal scrolling below.)

Commands that scroll the file display up or down also move the cursor to a different line if necessary to keep it on the screen.

The cursor is also kept out of the bottom line of the screen by scrolling the file display or moving the cursor up when necessary. This makes the next line always visible when text is being altered, reducing the chance of inadvertently typing over it.

ATTEMPTING TO MOVE OUT OF THE FILE

Any attempt to move the cursor beyond the end of the file or before the beginning of the file leaves the cursor unmoved. Add lines to the file if you wish to move above the beginning or below the end.

SCROLLING

The scrolling commands change the text displayed on the screen, without necessarily moving the cursor; these commands are commonly used to bring the desired text into view.

The cursor motion commands (previous section) also move the document on the screen, but only when necessary to keep the cursor destination in the display area.

Table 3-2. Scrolling Commands

<u>Command</u>	<u>Description</u>
^Z	Scroll Up One Line. Scrolls the file display (or directory) up one line: a line disappears off the top of the screen and a line is added at the bottom.
^W	Scroll Down One Line. Scrolls the file display (or directory) down one line.
^C	Scroll Up One "Screenful". Moves the display up by a "screenful", showing additional lines toward end of file. Cursor remains in same screen line, as nearly as possible to the same column. Actual motion is about 3/4 the number of displayed lines, so that there is some overlap between successive "screenfuls".
^R	Scroll Down One "Screenful". Moves the display down a "screenful."
^QZ	Continuous Scroll Up. Starts moving the screen display up continuously, a line at a time.
^QW	Continuous Scroll Down. Starts moving the screen display down continuously, a line at a time.

Vertical Scrolling (^Z and ^W)

For upward scrolling (downward file motion), the cursor line is moved down only if it is already in the top line of the text area; otherwise the cursor remains on the same character. However, if the file directory (see ^KF, Section 6) is displayed and there are additional lines of file names below the partial directory shown on the screen, ^Z will scroll the directory up one line and leave the file display unchanged.

Continuous Vertical Scrolling (^OZ and ^OW)

Whenever you initiate continuous scrolling, WordStar displays

TYPE 1-9 TO VARY SPEED, SPACE TO STOP

Press 1 for fastest scrolling, 9 for slowest. The default speed is initially 3. Press any other key to stop the screen motion.

Horizontal Scrolling

When working with a document wider than 79 columns, only characters in columns 1-79 will be shown on the screen, when the document first appears. However, as you attempt to move the cursor beyond column 79, the line in which the cursor rests will shift left 20 columns. After about one second, the rest of the line in view will also shift left. The lines on the screen shift similarly to the right any time you move the cursor back to a column beyond the left side of the screen.

Any time the margin is beyond the rightmost column that is visible on the screen, the ruler line will display a + at the right side of the screen. Flags displayed at the right side of the screen will have the same meanings as indicated in Table 2-2, even though the actual right margin is not in view.

For the purpose of scrolling horizontally, print control characters in the file are counted, even though they are not counted for the purpose of printing. With horizontal scrolling, it is possible to have a line more than 240 columns wide--the limit of the margin settings. (A line can be about 32,000 columns long.)

Horizontal scrolling is most useful in creating oversized documents, because it gives you a better picture of how a wide document will actually look.

Say you want to produce a document on 11" x 14" paper. You can set your right margin to extend past the last screen column (column 79 for most terminals), as usual. As you enter text past the last column, WordStar will scroll text to the left, so that you have a blank screen area into which you'll continue to enter text.

Horizontal scrolling is similar to vertical scrolling. With both kinds of scrolling, a "screen window" moves over a document larger than the screen to show you the text you're entering or some other portion you want to see. So, when you enter text in a blank screen area, previously-entered text scrolls off the screen. Whenever you're in doubt as to where you are, check the status line for the column number.

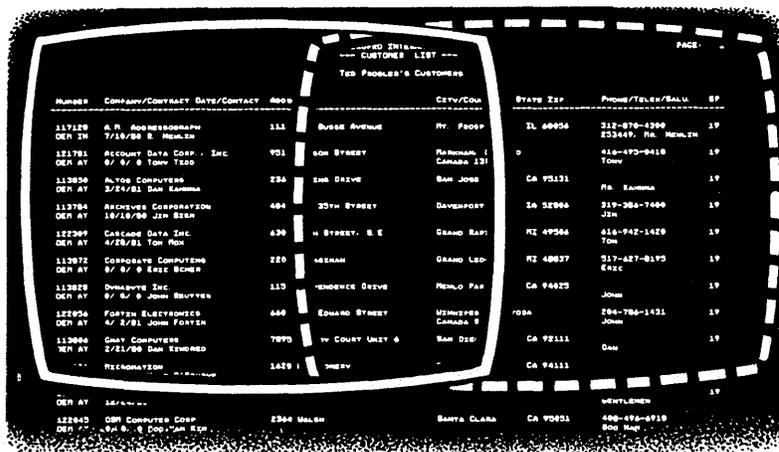
^QD will move you to the end of your line in increments, if the end is more than 80 columns from the cursor.

Here's an example of how WordStar handles an oversized document:

DATE: 4/14/81 MICROPRO INTERNATIONAL PAGE: 1
 --- CUSTOMER LIST ---
 Ted Prouler's Customers

NUMBER	COMPANY/CONTACT DATE/CONTACT	ADDRESS	CITY/COUNTRY	STATE ZIP	PHONE/TELEX/BULK	SP
117120	A. R. ADDRESSOGRAPH OEN IM 7/19/80 R. MANKIN	111 EAST BUSH AVENUE	MT. PROSPECT	IL 60056	312-878-4396 233449, Rn. MANKIN	19
117181	ACCOUNT DATA CORP., INC. OEN AT 8/ 8/ 8 Tony Toss	791 BONDSON STREET	MARKHAM, ONTARIO CANADA L3R2M7		416-493-9418 Toss	19
112850	ALTOZ COMPUTERS OEN AT 3/24/81 DAN KAMMA	2340 BUSH DRIVE	SAN JOSE	CA 95131	Rn. KAMMA	19
113784	ARCHIVES CORPORATION OEN AT 10/10/80 JIM BERN	404 WEST 35TH STREET	DAVENPORT	IA 52004	319-384-7440 JIM	19
122369	CASCADIA DATA, INC. OEN AT 4/28/81 TOM FOX	4300 28TH STREET, S.E.	GRAND RAPIDS	MI 49506	616-942-1429 Tom	19
112872	CORPORATE COMPUTERS OEN AT 8/ 8/ 8 ERIC BOHR	228 W. BIRCHMAN	GRAND LEAK	MI 48037	317-627-8193 ERIC	19
112828	DYNADATA INC. OEN AT 8/ 8/ 8 JOHN REUTER	113 INDEPENDENCE DRIVE	RENO, PAK.	CA 94423	John	19
122954	FORTIN ELECTRONICS OEN AT 4/ 2/81 JOHN FORTIN	440 KING EDWARD STREET	WINNIPEG, MANITOBA CANADA R2M 0P8		204-784-1431 John	19
112884	CHAT COMPUTERS OEN AT 2/21/80 DAN KENNEDY	7895 CONVOY COURT UNIT 4	SAN DIEGO	CA 92111	Dan	19
112824	RECOGNITION OEN IM 8/ 8/ 8 RENE O'ROURKE	1428 MONTGOMERY	SAN FRANCISCO	CA 94111	Rn. O'ROURKE	19
122850	RECOVERY OEN AT 12/24/80	10000 N.E. 8TH, 8017	BELLEVUE	WA 98004	206-453-8000 GENTLEMAN	19
122843	OSM COMPUTER CORP. OEN AT 8/ 8/ 8 BOB HAN KEN	2344 WALSH	SANTA CLARA	CA 95051	408-474-4918 BOB HAN	19
122199	ORSONO COMPUTER CORPORATION OEN AT 8/ 8/ 8	24000 CORPORATE AVENUE	NAVHARD	CA 94843	415-887-8000 GENTLEMAN	19
112421	SEE OF AMERICA OEN IM 8/ 8/ 8 RALPH VANDI	2345 W. COUNTY C	ROSELVILLE	MI 55113	612-636-5900 RALPH	19
112443	ROTHSCHILD INFORMATION SYSTEMS OEN AT 4/ 8/81 BYRON ROTHSCCHILD	248 SHELDON AVENUE	FALD ALTO	CA 94506	415-324-0000 BYRON	19
112775	S.D. SYSTEMS OEN AT 3/19/80 JOHN YOUNG	10111 ROLLER ROAD	DALLAS	TX 75238	214-346-8383 John	19
112160	SVETEL CORPORATION OEN AT 3/ 4/81 Rn. HANSEN	820 GUMBRIDGE PARKWAY	BURNHVALLE	CA 94006	408-746-2991 Rn. HANSEN	19

Printed Document
 < -- 125 characters -- >



Document Onscreen
 (first and second screen views)

Figure 3-2. Horizontal Scrolling

When you then want to go back to the previous screenful of text, use a command that moves the cursor off the left side of the screen (^A or ^S). The screen window will scroll to the left, and "+" flags will appear in the rightmost column. And, of course, word wrap will automatically take you back to the first screen, placing the cursor at the left margin. ^QS will also always take you directly to the beginning of the line in one scroll.

You should be aware that even if your right margin is less than 80, you could end up with lines that continue beyond the right edge of the screen. For example, this could happen if you are entering or inserting text with word-wrap off, or you insert text that pushes the line past the last column, or you join two paragraphs so that the line that joins them extends beyond the last column.

If you then try to move the cursor into the offscreen portion of the extended line, you may find that much of your text "disappears" from the screen. Don't be alarmed! You can get back to it simply by employing one of the commands that moves the cursor left (^A, ^S, ^QS).

TEXT ENTRY

Generally, text entry is accomplished simply by typing the text. However, related commands are used to control whether the text inserts or overtypes existing text, to control the forming of text into lines by word wrap, to indicate paragraph endings, or to "tab" to preset tab stops, etc.

The basic commands for entering text are shown in Table 3-3, with more detailed explanations of some commands in the paragraphs that follow. Additional commands and extensive discussion of on-screen text formatting for word processing purposes are given in Section 4, after presentation of deletion and saving commands.

Table 3-3. Basic Commands for Entering Text

<u>Command</u>	<u>Description</u>
^V	Insertion ON/OFF. Determines whether characters typed are inserted into current line, or replace (overtyp) characters already in line. Press once to turn insertion OFF, and again to turn insertion back ON. When on, INSERT ON shows in status line.
RETURN	End Paragraph. With insertion ON, RETURN inserts a hard carriage return in the file; with insertion OFF, RETURN makes the carriage return at the end of the line "hard" if it is "soft", then moves the cursor to the beginning of the next file line.
^N	Insert "Hard" Carriage Return. A "hard" carriage return is inserted at the cursor position and the cursor is left in front of it; that is, the cursor is not moved. Text to the right of or below the cursor moves down.
^I	Tab. Advance to the next tab stop. If there are no more tab stops on the current line, go to next line. Only tab stops set within the margins are used unless word wrap is off or margins are released.

Table 3-3. Basic Commands for Entering Text (Continued)

<u>Command</u>	<u>Description</u>
^OI	Set Variable Tab. Sets either an ordinary or a decimal tab stop (see Section 4).
^ON	Clear Variable Tab. Clears a tab stop (see Section 4).
^OF	Set Tabs and Margins from "Ruler" Line in File. Allows you to type a line of symbols in your file to be used to set tabs and margins (see Section 4).
^Px	Enter Control Character. ^P followed by a letter (x) enters the corresponding control character into the file; any other character except space is entered exactly as typed. This permits entering control characters that normally have command functions. For example, ^P^S or ^PS will enter a CTRL S (^S) into the document.

End Paragraph (RETURN)

If the line spacing is set to 2 when you press RETURN, two returns are inserted or two lines moved down over, etc. RETURN should not normally be used between the lines of a paragraph; let word wrap form the lines instead.

RETURN with insertion ON will split a line into two if the cursor is in mid-line, or produce a blank line if the cursor is at the beginning or the end of a line.

RETURN with insertion OFF may be used to change a soft carriage return to hard; for example after deleting the last line or lines of a paragraph.

Insert "Hard" Carriage Return (^N)

Depending on the cursor position, ^N will create a blank line (cursor at beginning or end of line) or split a line into two lines (cursor in mid-line).

Comparison of RETURN and ^N

Note the following differences between inserting a carriage return with RETURN and inserting a carriage return with ^N:

- o ^N makes an insertion whether insertion is ON or OFF; RETURN makes an insertion only when insertion is ON.
- o ^N leaves the cursor **before** the inserted carriage return; RETURN leaves the cursor **after** the carriage return.
- o ^N always single spaces; RETURN inserts multiple returns (or moves multiple lines) if the line spacing (^OS) is set greater than 1.

Generally, RETURN is the more convenient key to use when paragraph ends or blank lines are needed in the course of continuous text entry. ^N is a convenient way to make a blank line or lines into which to type a paragraph to

be inserted. Using ^N first makes sure the new line or paragraph ends in a "hard" carriage return even if you forget to type RETURN at the end; only a single ^N is necessary before entering a paragraph of any length under word wrap. Experienced users find ^N extremely useful in correcting text already entered.

Tab (^I)

The tab function works one way when insertion is ON and another way when it is OFF:

Insertion ON: Tab inserts spaces, and possibly a "hard" carriage return, to reach next tab stop. Text after the cursor moves ahead.

Insertion OFF: Tab moves the cursor over existing text; if there is no more existing text and the next tab stop is on the current line, the line is extended with spaces; if there are no more tab stops on the current line, WordStar inserts a "hard carriage return" and moves the cursor to a new line.

Note that the tab key (with insertion ON, or cursor beyond end of line; and variable tabbing on) enters regular space characters into the file. These will be subsequently edited just as if they had been entered with the space bar.

Each tab stop may be regular or "decimal". After you tab to a "decimal" stop, text moves left as entered until "." is pressed, aligning the data so the point is at the tab stop. See Section 4.

For tab operation with variable tabbing turned off (^OT command), see "Fixed Tabbing Mode," Section 6.

Enter Control Character (^Px)

^P is used to enter "print control characters" for underlining, boldface, subscripting, etc. into the document. These characters are fully described in Section 7 and summarized in the Print Menu. ^P- may also be used to enter a "hard" (regular) hyphen when "soft hyphen entry" is on (see ^OE, Section 4). In addition, ^P may be used to key in any code (1-7F hex) that your keyboard can generate, for special (non-document) purposes. The character entered with ^P will insert or overwrite, depending on whether insertion is ON or OFF. Table 3-4 summarizes some of the uses of ^P.

Table 3-4. Some Uses for ^P

<u>Command</u>	<u>Description</u>
^P-	Enter Hard Hyphen. Always enters a "hard" (regular) - even if soft hyphen entry (^OE) is on or ^B (with hyphen-help, ^OH, on) is pausing to allow hyphenation.
^PO	Enter Non-Break Space. Enter a control-O into the file at points where you want a space to print but you do not want the line wrapped or spaces inserted for justification.

Table 3-4. Some Uses for ^P (Continued)

Command	Description
^PH	Strikeover. Causes the next character to overprint the preceding character, i.e. to print in the same position. Strikeover displays as ^H.
^P RETURN or ^PM	Enter Overprint Line. Enters "carriage return" code without "line feed" overprint code into file, causing the LINE entered immediately after "^P RETURN" to OVERPRINT the preceding line. A hyphen (-) appears in rightmost column of screen to indicate that next line overprints line with hyphen (-).

Overprint Lines (^P RETURN or ^PM)

Overprint lines may be used to produce special effects, by printing multiple characters in the same column position. The ^P command is fully described in Section 7.

Other Commands

Many other commands influence the on-screen formatting of text. Read Section 4 for full descriptions; refer to the Onscreen Menu for a brief summary.

Hints for Entering Tables

Set the margins wider than the table and clear all tab stops. Set a tab stop for each desired column. Press the TAB key after entering each field. Tabbing after the last item on each line will automatically take you to the first field on the next line. Setting the margins and tab stops is discussed in Section 4 under the subheading "Setting Tab Stops and Margins".

If the table is not at the end of the file, check that insert is ON before entering the table, or use ^N to make a number of blank lines for the table.

To ensure that the table prints with the columns aligned as they appear on the screen (even if ^B or word wrap is used accidentally), place a .UJ OFF dot command just before the table to turn microjustification OFF. If .UJ OFF is not used, and a line in the table is word-wrapped or reformed with ^B (Section 4), the line may not print exactly as it appears on the screen. Remember to use .UJ ON at the end of the table to turn microjustification back on.

TEXT DELETION

The commands shown in Table 3-5 are used to remove text from the document.

Table 3-5. Deletion Commands

<u>Command</u>	<u>Description</u>
^G	Delete Character. Deletes the character at the cursor position. If the cursor is at the end of a line, deletes the carriage return, joining two lines.
DELETE	Delete Character Left. Deletes the character immediately left of the cursor. If the cursor is at the beginning of a line, deletes carriage return, joining the current line onto the preceding line. DELETE , DEL , RUB and RUBOUT are alternate labelings of the same key. The code " ^_ " (1F hex) is generated by some keyboards if the CTRL key is held while DELETE is pressed. The latter code is accepted to make it unnecessary to release the CTRL key or (on some keyboards) move to the SHIFT key before rubbing out characters.
^T	Delete Word Right. Deletes the word containing the cursor, and following spaces. If the cursor is in mid-word, ^T deletes only that portion of the word at and to the right of the cursor. If the cursor is between words, ^T deletes only the spaces up to the next word. If the cursor is at the end of a line, ^T deletes the carriage return and any spaces following. See "Definition of a Word" earlier in this section.
^Y	Delete Line. Deletes the entire line, on and off the screen, in which the cursor is resting. The lines that follow move up on the screen.
^QY	Delete to End of Line. Deletes from the cursor position rightward in the line in which the cursor is resting. Does not delete carriage return at end line, nor overprint lines.
^Q DEL	Delete to Beginning of Line. Deletes leftward to the beginning of the line (like ^QY). (See DELETE in this table for other key names.)
^KY	Delete Block. Deletes the currently marked block of text. See "Block Operations", Section 6.

SAVING AND ABANDONING

A document that you are entering or changing is not permanently stored until "saved" on disk. Furthermore, only a disk-saved document can be printed. The commands for saving (and abandoning) files are shown in Table 3-6.

Table 3-6. Saving and Abandoning Commands

<u>Command</u>	<u>Description</u>
^KS	Save File and Resume. Saves the document and initiates re-edit: short for ^KD followed by another D (or N) command for same file. Cursor is left at beginning of file; to restore cursor to previous position, enter ^QP as the next command. Use ^KS frequently to save your work so far, then continue editing the same document. Also, this command is the fastest way to get the cursor from the end to the beginning of extremely long files.
^KD	Save File--Done. Saves the document and goes to the no-file menu.
^KX	Save File and Exit. Saves the document and exits from WordStar to the operating system.
^KQ	Abandon File. Terminates editing of this file without saving the new version. Asks for yes-no confirmation if changes have been made; goes to the no-file menu after termination. Use ^KQ when you do not want the changes saved; also useful when no changes have been made, as after "editing" a file to inspect the document on the screen.

Every editing session whose results you want to keep must be ended with one of the "save" commands; a save must be issued during editing if you want to print what you have done so far; saving frequently during long sessions is advisable to guard against power failures, computer breakdown, or catastrophic command errors.

WordStar provides a "save and resume" (^KS) command to save your work so far, then continue editing. This eliminates the need to enter a "D" command after saving, and is a convenience for saving periodically during long sessions or saving to permit printing the text entered so far. After this save, if the help level is not 0, WordStar displays a message reminding you that the ^QP command may be used to return the cursor to its position before the save.

Note

Until saved, all changes made are temporary, and will be lost in the event of a power failure, computer crash, full disk, etc. The ^KS command provides a convenient way to file and continue editing. Save early and save often!

After saving is completed, the original file (the one named in the "D" command or after "WS" in the system command that calls up WordStar) will contain the updated document, and a file with the same primary name but type BAK will contain the previous version of the document. Note that only one .BAK file is kept. Multiple saves, including ^KS's, will lose the original input file. The **General Information Manual** describes file changes because of a "save."

After saving with the ^KD command, the no-file menu is displayed. You may then edit another file, print a file, or perform other commands. It is thus possible to edit several files in succession without re-invoking WS for each one.

The commands in this section relate to saving (filing) the document being edited under the file name it came from. The ADDITIONAL FILE COMMANDS, described in Section 6, permit other file-related operations such as writing part or all of the document on a file with a different name, merging files, and splitting a file into several files.

Section 4 On-Screen Text Formatting

FORMATTING COMMANDS

The commands for formatting text on the screen are shown in Table 4-1, followed by detailed descriptions of some of the commands.

Table 4-1. On-Screen Text Formatting Commands

<u>Command</u>	<u>Description</u>
^OC	Center Line. Document line containing cursor is centered between current margins. Blanks at beginning and end of line are ignored.
^OL	Set Left Margin. Asks for left margin. Either enter a number 1-240 and press RETURN or press ESCAPE to use cursor column margin number (as shown in COL item in status line).
^OR	Set Right Margin. Asks for right margin; enter column number of rightmost column to use for text, or press ESCAPE key to use cursor column.
^OF	Set Margins and Tabs from Ruler Line in File. Sets left margin to position of leftmost non-blank character in line containing the cursor, and right margin to rightmost non-blank character. This is a convenient way to reset the margins to match those used in a particular paragraph (or in a specially typed line).
^OG	Paragraph Tab. Temporarily sets the left margin in one tab stop from its present setting. For example, if the left margin is set at 1 and there is a tab stop at column 6, typing ^OG once will temporarily move the left margin to column 6. Successive ^OG's will set the left margin to successive tab stops.
^OS	Set Line Spacing. Asks for a number and sets line spacing. Enter 2 for double spacing, 3 for triple spacing, etc. This spacing is used whenever word wrap wraps a line, by ^B, and when the RETURN key is pressed.
^B	Reform Paragraph. "Forms" existing text as it was formed during entry by word wrap (except with optional hyphen-help) to end of paragraph. Starting point is left margin of line containing cursor, or cursor position if to left of left margin. Ending point is next hard carriage return encountered, or form feed or end of file.
^OI	Set Tab Stop. Asks for column number at which to set a (variable) tab stop. An ! will appear in the ruler line to show the new tab stop. Enter an # to set a decimal tab stop. An # will appear in the ruler line. (^O TAB can also be used.)
^ON	Clear Tab Stop(s). Asks for column at which to clear tab stop; type "A" and RETURN to clear all tab stops.

Table 4-1. On-Screen Text Formatting Commands (Continued)

<u>Command</u>	<u>Description</u>
^I	Tab. Moves cursor or inserts spaces to next tab stop on line; if none, goes to first tab stop on next line. Unless word wrap is off or margins are released, only tab stops between the margins are used. Fully described in Section 3 for the variable (normal) mode. (TAB may also be used.) For Decimal Tabs, see explanation later in this section.
^OX	Margin Release. Margins are released until the cursor has gone outside the margins then returned to between margins. MAR REL appears in status line while in effect. If margin release is already in effect, another ^OX unreleases it. Margin release has the same effect as turning word wrap off except that margin release terminates automatically.

Onscreen Menu Display (^O)

The Onscreen Menu shows whether the following features are currently ON or OFF:

Hyphen-help	Justification
Variable tabbing	Print control display
Page break display	Soft hyphen entry
Word Wrap	Ruler display

Setting the Margins (^OL and ^OR)

The left and right margins should be set to the desired values whenever text is being entered (unless word wrap is turned OFF), and whenever the reform paragraph command (^B) is used.

Setting Ruler Lines (^OF)

The ^OF command also sets tab stops at any columns containing an !, or decimal tab stops at any columns containing an #, and clears tab stops at columns containing a hyphen (-). Thus a "ruler" for tab stops and margins may be entered into the file, as discussed later in this section.

Setting Paragraph Tabs (^OG)

The margin set with ^OG is temporary; it will remain in effect only until RETURN is pressed, another margin command is entered, or the cursor is moved to a location in front of the place where ^OG was typed. On terminals with highlighting, the ruler at the top of the screen will display un-highlighted to the left of the temporary left margin set with ^OG.

Reforming a Paragraph (^B)

The ^B command may be used to reform text after making insertions or deletions. The ^B command may also be used to change margins, to change line spacing, to justify or unjustify the text, and/or to assist in hyphenation.

Set the desired parameters, position the cursor in the first line to be altered, and type ^B. Upon completion, ^B leaves the cursor after the hard carriage return (paragraph end) that terminated the reform operation.

If Hyphen-Help (^OH) is ON, the ^B command may pause to allow a hyphen to be entered to split a word between lines. To hyphenate, move the cursor if desired, then press the hyphen (-) key. To continue reforming without hyphenating, type ^B.

Additional description of the ^B command follows later in this section.

TOGGLE KEYS

The toggle keys for formatting are shown in Table 4-2, followed by detailed descriptions of some of the toggles.

Table 4-2. Formatting Toggle Keys

<u>Command</u>	<u>Description</u>
^OW	Word Wrap ON/OFF. Turns word wrap off if currently on; turns word wrap on if currently off. Turning word wrap off also activates any tab stops outside the current margins. Word wrap is described in detail after this table.
^OJ	Justification ON/OFF. When ON, "soft" spaces are inserted in each line formed by word wrap or ^B to bring the right end of each line out to the exact margin; when off, no "soft" spaces are inserted (and any already present are removed), leaving text "ragged right".
^OV	Variable Tabbing ON/OFF. When ON, WordStar's variable tab stops are in effect, and spaces are entered into file for tabs. When OFF, the description under "Fixed Tabbing Mode" in Section 6 applies. Should normally be left on for word processing use. Note: when turned OFF, the ruler line continues to show the variable tab stops.
^OT	Ruler Line ON/OFF. Turns display of the "ruler" line showing margins and tab stops off and on.
^OP	Page Break Display ON/OFF. Controls display of page break lines _____P in file display area of screen and PAGE and LINE items in status line.
^OD	Print Control Display ON/OFF. Controls display of control characters which do not print. Turn OFF to make the screen look more like printout when checking text; keep on while editing.

Turning ^OD off greatly improves visualization of text containing many print controls. Always turn ^OD back ON before editing. If textual changes are made with print control display off, the print controls will usually remain in their old places, which will usually yield undesired results.

Table 4-2. Formatting Toggle Keys (Continued)

Command	Description
^CH	Hyphen-Help ON/OFF. When Hyphen-Help is ON, the ^B command (reform paragraph) will pause upon encountering a long word that does not quite fit on the line. The operator may then position the cursor (which indicates where the hyphen will be placed) and press the hyphen (-) key to insert a (soft) hyphen and continue reforming, or press ^B to continue reforming without hyphenating.
^OE	Soft Hyphen Entry ON/OFF. When soft hyphen entry is ON, the "-" key always enters a "soft" hyphen, rather than a regular (hard) hyphen or dash. A soft hyphen is a hyphen that will print ONLY if word wrap or paragraph reform (^B) leaves it at the end of a line.

Page Break Display Toggle (^OP)

When page break display is off, FC=cccc and FL=lll display in status line as described in Section 2. By moving the cursor to the end of file and reading the FC= item, you can determine file size.

Print Control Display Toggle (^OD)

Note the following points when ^OD is OFF,

- o those soft hyphens (see ^OE in this table) which will not print do not display;
- o the "non-break-space" character (control-O) displays as a space, rather than "^O";
- o other print controls do not display (see Section 7).

Soft Hyphen Entry Toggle (^OE)

Turning soft hyphen entry ON allows hyphenating words with the - key as text is entered; only the hyphens which fall at the end of line will print. Turning ^OE ON is not necessary to hyphenate when ^B pauses for hyphenation under hyphen-help. Soft hyphens display highlighted; the ^OD command (above) can be used to suppress display of soft hyphens which will not print. To enter a hard hyphen—even if ^OE is ON—type ^P -. When ^OE is ON, the hyphen (-) key also enters a soft hyphen into a file name, or a text to search for or substitute, or answering other questions asked by various WordStar commands. To enter a hyphen in a file name when ^OE is ON, type ^P -. See the additional description of soft hyphens in the text later in this section.

Table 4-3. Defaults for Parameters

Item	Document Mode	Non-Document Mode
Left Margin	Column 1	Column 1
Right Margin	Column 65 (80-column screen) Column 60 (64-column screen)	Column 65 (80-column screen) Column 60 (64-column screen)
Variable Tab Stops	Cols. 6, 11, 16, ..., 56	-
Fixed Tab Stops	-	Cols. 9, 17, 25, ...
Variable Tabbing	ON	OFF
Word Wrap	ON	OFF
Justification	ON	OFF
Ruler Display	ON	OFF
Page Break Display	ON	Inoperative
Print Control Display	ON	ON
Soft Hyphen Entry	OFF	OFF
Hyphen-Help	ON	OFF

Any changes made in the items shown in Table 4-3 remain in effect as successive files are edited, except that all of the ON/OFF items are re-defaulted if an N edit follows a D edit, or vice versa.

ENTERING TEXT WITH WORD WRAP ON

Set the margins (^OL and ^OR, or ^OF) if you don't want to use the defaults. Turn justification off (^OJ) if you want ragged right, set the line spacing (^OS) for double or triple spacing if desired. On the first keystroke, indentation to the left margin (if not at column 1) will occur.

Each time you type beyond the right margin, the partial word that didn't fit on the line is moved down to the left margin on the next line, and the preceding line is justified (unless you selected ragged right). Within a paragraph, type without using the RETURN key, letting WordStar form the text into lines. Avoiding use of the return key in mid-paragraph is important: if you do use the RETURN key, the resulting "hard" carriage return will interfere with later paragraph reforming after corrections.

At the end of a paragraph, press the RETURN key. This will record a "hard" carriage return (fixed line break) in the file, indicated on the screen by a < in the rightmost column. If you want a blank line between paragraphs, press RETURN twice. Two RETURNS are all you need between block paragraphs. Any-

where else you want a fixed line break, as between lines of a list or a table, press the RETURN key.

Spaces in the Text

Any spaces you type are permanently kept in the file; they are termed "hard" spaces. To form indented paragraphs, type the desired number of spaces at the beginning of each paragraph. The first time you press the space bar, WordStar will indent to the left margin before entering your space, so that your space is in addition to those supplied by WordStar to get to the margin. The TAB (^I) key may also be used to begin indented paragraphs (with a stop set at the desired column (^OI)).

If you like two spaces after all periods, type that way. Your spaces will be kept. When a period falls at the end of a line, your spaces won't show on the screen but they will come back if later reforming makes the period fall in the middle of a line.

The spaces added to your text by indentation to the left margin, along with any added to the line during justification, are termed "soft" spaces. Soft spaces appear the same on the screen as hard spaces, but they are distinct to WordStar. If the line is later rejustified, or reformed to a new left margin, "soft" spaces will be selectively removed, but all spaces you entered (including with the TAB key) will be kept.

Releasing the Margins

Any time you want to enter something outside the margins, you may release the margin (^OX), move the cursor to the desired position, and enter the desired text. You don't need to release the margins in order to get the dot of a dot command line in column 1. Word wrap automatically disables whenever you are entering a period in column 1, or whenever the current line already contains a period in that column.

Print Control Characters

A formed line containing print control characters will appear to extend beyond the right margin on the screen. This is because the print controls occupy no character positions on the printed page; when printed, the line will be the correct length. (The print control characters, such as CTRL S to turn underlining on and off, are described in Section 7.) To view the text on the screen as it will print, you may turn off the display of print control characters with ^OD. Only the characters to be printed will then appear on the screen; a line containing print controls will appear the correct length. Be sure to turn print control display on again before continuing to edit.

HINTS FOR EDITING FORMATTED TEXT

Centering Lines

To center a line of text between the current margins, place the cursor anywhere in the line and type ^OC. This command deletes spaces and tabs at the beginning of the line and enters the appropriate number of hard spaces to center the line. In determining centering, spaces at the beginning and end of the text on the line are ignored.

Correcting Text within a Paragraph

First set the margins, line spacing, and justification to match the paragraph to be altered—if they are not already so set. The most convenient way to set the margins is to place the cursor in any full-length line in the paragraph, then type ^OF.

Then, change the text without worrying about the format. Position the cursor, delete text, insert new text, and turn insertion off (^V) to permit overtyping, as appropriate.

After you have the desired words in the paragraph, position the cursor in the first changed line (or the first line that looks messy), and type the paragraph reform command, ^B. The paragraph will be fixed up to look the same as if it had just been typed in with word wrap on, and the cursor will be left on the line immediately following the paragraph. You may notice that ^B stops part way through the paragraph and displays a message about hyphenation. This is hyphen-help, discussed further below. To continue without hyphenating, just type another ^B. To prevent such stops, turn hyphen-help off (^OH).

If you insert near the beginning of a line, the end of the line will move right, possibly even moving off the screen. This is OK. ^B will fix the overlong line.

Of course, text correction can be intermixed with text entry as desired. For example, if you notice a misspelled word two lines back, cursor up to it, correct it, and type ^B to make sure that line and the following lines are correctly formed. A backspace (^S) after the ^B will usually replace the cursor at the end of the paragraph, where you were entering text.

Whenever you are altering a paragraph, make sure it ends up with a hard carriage return at the end. Sometimes deleting text at the end of a paragraph will leave it without one (no < in the rightmost column of the screen). To correct this, "harden" the carriage return by placing the cursor at the end of the line (^OD) and, with insertion off (^V), press RETURN. Alternate methods of inserting hard returns include RETURN with insertion on and ^N. After one of these, you will probably find there is an excess soft return (evidenced by a blank line on the screen) which you must delete (^G).

Inserting a Paragraph

To insert a new paragraph between two existing paragraphs, position cursor on the first line of the second paragraph at the left margin and type ^N. ^N inserts a "hard" carriage return and leaves the cursor in front of it. Thus, the return needed to terminate the paragraph is now in the file and follows the cursor, which is on a blank line. Type the body of the paragraph. As word wrap forms lines, the paragraph below is pushed down. Type additional ^N's (or RETURNs with insertion on) if necessary to get the desired number of blank lines between paragraphs.

Splitting a Paragraph

To split a paragraph into two, position cursor at desired division point. Type ^N. This splits the line and supplies a hard carriage return to terminate the first paragraph, leaving the cursor in the last line of the first paragraph. Now type ^B, to remove any justification spaces from the last line of the first paragraph (the last line of a paragraph is never justified). Type additional ^N's (or RETURNS with insertion on) if blank line(s) are desired between paragraphs. The second paragraph now begins with a partial line that is probably not indented correctly. Place the cursor at the beginning of this line, correct the number of spaces present (add spaces if you are using indented paragraphs; delete any leftover spaces for block paragraphs), then type ^B to reform the second paragraph.

Joining Two Paragraphs

To join two paragraphs into one, place the cursor at the end of the last line of the first paragraph. Type ^G's to eliminate all carriage returns between the paragraphs, joining the first line of the next paragraph onto the current line. The cursor will now be in the middle of a long line. Establish the correct number of spaces as desired at this point (presumably one or two after a period). To avoid confusion over soft and hard spaces, the surest procedure is to delete all spaces adjacent to the cursor, then insert the one or two desired. Now type ^B, to fix the long line and reform to the end of the paragraph.

Note

As noted earlier, the forming operation removes all "soft" spaces from the text at the start. There is an exception to this: whenever removing a soft space or soft carriage return would result in running two words together with no space or "-" between them, the forming operation inserts a hard space in order to avoid running words together. This simplifies editing by making it unnecessary to type a space after words added to the end of a line.

Changing Margins, Justification, or Line Spacing

Paragraph reform (^B) works just as well for applying new settings to existing text as it does for applying the settings to modified text. Of course, it will also apply new settings to modified text. Set the desired margins, justification, and line spacing. You may wish to turn hyphen-help off (^OH) if you do not wish ^B to stop to hyphenate words. Put the cursor at the beginning of the paragraph and type ^B. The text will be reformed as specified, even unjustified if previously justified, without the need to reenter a single character.

For example, if you were to change the left margin to column 5, turn justification off, set the line spacing to 2, place the cursor at the beginning of the preceding paragraph, and type ^B, you would end up with the following example of ragged right text:

Paragraph reform (^B) works just as well for applying new settings to existing text as it does for applying the settings to modified text. Of

course, it will also apply new settings to modified text. Set the desired margins, justification, and line spacing. You may wish to turn hyphen-help off (^OH) if you do not wish ^B to stop to hyphenate words. Put the cursor at the beginning of the paragraph and type ^B. The text will be reformed as specified, even unjustified if previously justified, without the need to reenter a single character.

Since paragraph reform ^B starts with the line containing the cursor, it may be used to change margins (or justification or line spacing), in mid-paragraph. For example, you might want the text to get narrower in mid-paragraph to leave a space for a diagram on one side of the page. To produce such a space, first form the entire paragraph to the margins you desire for the first portion. Then set the new margins, position the cursor in the first line to have the new margins, and type ^B again. That line and succeeding lines will be reformed while the part above the cursor will remain unchanged. Additional margin changes may be made by applying ^B as many times as desired, each time starting farther down in the paragraph.

^B will help you hyphenate existing text if hyphen-help (^OH) is ON. As explained under "Hyphen-Help" below, ^B with hyphen-help ON will stop whenever a long word that appears to be a good candidate for hyphenation is encountered. You may press the hyphen (-) key to hyphenate and continue reforming, or press ^B to continue without hyphenating (thus placing the word on the next line). You may move the cursor (^S or ^D) before pressing the hyphen key (-). Hyphens entered through hyphen-help are "soft", that is, they will not print if later reforming places them in mid-line.

Cursor Position Before Reform

Paragraph reform (^B) never shifts any text on the first line that is either to the left of the cursor position or to the left of the left margin currently set. This allows section numbers and outline numbers to remain left of the margin when the paragraph is reformed, as discussed below.

When you wish to move a paragraph's left margin to the right, the cursor must be placed to the left of all text on the first line before you type ^B; otherwise, the text to the left of the cursor will not be moved rightward. In other words, if the left margin of the paragraph as displayed on the screen is to the left of the current left margin setting, be sure to place the cursor to the left of all text on the first line (including any hard spaces used for paragraph indentation) before typing ^B.

When the new left margin is set the same as, or to the left of, the left margin of the paragraph to be reformed, the cursor need not be positioned to the left of the text on the first line.

Unless there is a section number or word outside the left margin, placing the cursor at the beginning of the first line to be reformed before typing ^B always works, and placing the cursor anywhere in the first line works unless the new left margin is set to the right of the left margin of the text as displayed.

Text to the Left of the Left Margin

The ^OG (paragraph tab) command is particularly useful when entering or reforming text where there is a section number, word, or other text left of the margin. This command temporarily resets the left margin to the next tab stop.

1. This paragraph was entered by typing the 1, a period, ^OG, then the text of the paragraph. The next tab stop was located in column 6, so ^OG temporarily set the left margin to column 6. The temporary margin remains in effect until the RETURN key is pressed, or until a cursor motion command is used to move the cursor out of the paragraph or before the position within the paragraph where ^OG was typed.
 - a. Each successive ^OG moves the left margin over one more tab stop. To enter a paragraph like this, type ^OG, then "a" and a period, followed by a second ^OG, then the text of the paragraph.
 - b. A convenient way to enter an outline is to set tab stops at all desired indentations, clear any other tab stops, and use multiple ^OG's to establish each indentation.
2. You may also use ^OG to reset the left margin temporarily when reformatting a paragraph with ^B. Be sure to place the cursor to the right of any section number (or other text left of the left margin) before pressing ^B. The temporary margin will be released when the ^B is complete.

^OG is useful when the only text outside the margin is to the left of the first line of a paragraph. If you wish to enter text left of lines after the first line, or to the right of any line, of a formed paragraph, enter the paragraph first, then enter the text outside the margins with the margins released. For example, Table 4-2 has two columns, with formed text in the "Description" column. This table could be entered by setting the margins for the "Description" column, entering the command descriptions, then releasing the margins, turning insertion off, and typing the "Command" items.

Preventing Unwanted Micro-Justification

When printing text that has been "formed" with word wrap or paragraph reform (^B), WordStar will distribute the justification space evenly between the words on a line. This produces good appearance for paragraphs, but it can produce undesired results for tables or other text where the column alignment in the printout should be exactly as on the screen. Normally, such tabular text should not be reformed; word wrap should be prevented during entry of tabular text by setting the margins wider than the table and using the RETURN (or TAB) key between lines.

To ensure correct printing of columns of text, even if (inadvertently) word-wrapped or reformed, place the dot command .JJ OFF (Section 8) before the table. Type .JJ ON after the table to return to normal micro-justified printing. Further hints on entering tables are given in Section 3.

Hyphen-Help

Hyphen-help assists in improving the appearance of text by hyphenating long words that fall at the end of lines. With hyphen-help on, the paragraph reform command (^B) will identify long words that won't quite fit on a line, check that the word contains two syllables, roughly establish the proper place to hyphenate, then stop to allow the operator to indicate whether to hyphenate or not. Since the cursor may not be in exactly the right place for a hyphen, you can move the cursor one or more characters in either direction before pressing the hyphen key (-).

Hyphens entered via hyphen-help are "soft" hyphens; that is, they will not be printed if later reforming places them in the middle of a line, but they will remain in the file and be reactivated if further reforming places them at the end of a line again.

To use hyphen-help, make sure that ^OH is on (press ^O and look at the menu to check), make sure the margins, line spacing, and justification are set as desired, place the cursor at the beginning of the paragraph, and press ^B. When ^B finds a likely place to hyphenate, reforming stops and the following message is displayed at the top of the screen (except at help level 0):

TO HYPHENATE, PRESS -. Before pressing -, you may
move cursor: ^S=cursor left, ^D=cursor right.
If hyphenation not desired, type ^B.

The cursor will be on the character before which WordStar suggests inserting a hyphen. To hyphenate where the cursor is, press the - key. A "soft" hyphen will be inserted--regardless whether soft hyphen entry (^OE) and insertion (^V) are ON or OFF--and reforming will continue. If you wish to adjust the hyphen position, move the cursor left or right, then press -. If you do not wish to hyphenate the word, just press ^B, and reforming will continue, placing at the beginning of the next line the un-hyphenated word.

While the above message is on the screen, other commands may be used, such as ^Z to bring additional text into view. However, if the cursor is moved out of the word or right of the margin, or if a character other than the hyphen (-) key is entered, the message will clear and the hyphen (-) key will lose its special meaning. (If for some reason you wish to enter a regular (hard) hyphen while the above hyphen-pause message is on the screen, be sure to type ^P-, not just -.)

^B may stop for hyphenation and display the message shown above several times while one paragraph is being reformed -- one such pause occurs for each word which WordStar considers a good candidate for hyphenation. If you do not wish to hyphenate, you may turn hyphen-help off (^OH) to prevent such pauses.

Even with hyphen-help ON, ^B may complete with no hyphenation pauses. This is normal; it indicates the paragraph contains no words which WordStar considers good candidates for hyphenation. ^B will not concern itself (or you) with

words that fall in mid-line, with words with too few characters for the line being formed, with words that appear to have only one syllable, or with words whose entire first syllable does not appear to fit on the line. If you wish to hyphenate even in cases where ^B does not stop, it is possible to enter soft hyphens explicitly, as described in the next subsection.

Hard and Soft Hyphens

WordStar supports two kinds of hyphen characters: regular (hard) hyphens which always print, and "soft" hyphens which indicate syllable breaks where a word may be divided between lines (and a - printed), but where no hyphen should print if the entire word is placed on the same line.

SOFT HYPHENS

Soft hyphens display as a -; on terminals with highlighting the - will be dim or in inverse video. Once a soft hyphen is entered into the file, it always remains (unless explicitly deleted), but it may be activated (printed) or deactivated any time the line containing it is formed. Whenever word wrap or paragraph reform (^B) encounters a soft hyphen, the soft hyphen is set to print if it falls at the end of a line (if the soft hyphen is used as a place to divide the word between lines); otherwise, it is set not to print.

Soft hyphens are set to print or not print **only during line-forming**. Thus, if you make changes in the file (particularly the insertion or deletion of carriage returns after soft hyphens), and neglect to type ^B, you may get a hyphen that prints when it shouldn't or vice versa.

You can verify which soft hyphens will print by turning off display of print controls (^OD). Those soft hyphens which will not print will disappear from the screen. Be sure to turn ^OD back on before attempting to edit.

Soft hyphens are commonly entered using ^B with hyphen-help on, as described under the preceding subheading.

Soft hyphens may also be entered explicitly, by turning on soft hyphen entry (^OE), then pressing the hyphen (-) key whenever a soft hyphen is desired. For convenience, soft hyphens entered with the hyphen (-) key are always inserted even if insertion (^V) is off. Each soft hyphen entered with the hyphen (-) key is initially a non-printing soft hyphen; the soft hyphen will be set to print if word wrap or ^B subsequently breaks the word at the soft hyphen. After adding a soft hyphen to existing text, be sure to reform (^B) if you want the soft hyphen to print.

When soft hyphen entry is ON, you must either type ^P- or turn ^OE off to enter a regular - (hard hyphen) into the file. One of these methods may also be used for the answer to a question asked by a WordStar command, such as a text to search for or a file name. Ordinarily, you should leave ^OE OFF.

Soft hyphens may also be entered with the replace command (Section 5). For example, you may selectively change hard -'s (type ^P-) to soft hyphens (press - with ^OE on), or substitute soft hyphens into all occurrences of a long word. Be sure to reform (^B) after each such replacement.

HARD HYPHENS

Hard hyphens (regular -'s) are used whenever a - that always prints is desired, as in a word like hyphen-help or where a dash (--) is desired. A hard hyphen can be entered by pressing the hyphen key (-), unless ^OE is on or ^B is pausing for hyphenation (i.e., the prompt shown above under "Hyphen-Help" is displayed). A hard hyphen can **always** be entered by pressing ^P, then -.

Line-forming (^B or word wrap) will break a word at a hard hyphen if the hyphen happens to fall at the end of the line. However, unlike a soft hyphen, the hard hyphen will still be printed even if later reforming places the hyphen in the middle of a line.

Setting Tab Stops and Margins

The commands for setting the margins (^OL and ^OR) and for setting and clearing tab stops (^OI and ^ON) all ask for a column number.

For example, ^OL asks:

LEFT MARGIN COLUMN NUMBER (ESCAPE for cursor column)? █

To set the left margin (in our example) by column number, type the desired column number and RETURN. To use the cursor column (as shown in the status line), just press the ESCAPE key. To keep the same margin (i.e., to cancel an unintended command), press RETURN, or press ^U, the WordStar "interrupt" key.

To set the margins to match an existing line of text, position the cursor anywhere in this line and type ^OF. This is the most convenient method of setting the margins to match an existing (justified) paragraph, before making changes in the paragraph; this procedure may also alter the tab stops if there happen to be any !'s, #'s, or -'s in the line.

To set and clear individual tab stops, ^OI and ^ON are convenient.

Using "Rulers" in Your Document

To set the desired tab stops and clear all others, and set the margins at the same time, you may prefer to use a "ruler" line. Type a line into the document with

- ! at each column where a regular tab is to be set
- # at each column where a decimal tab is to be set (next subsection)
- in all other columns between the left and right margins

These must be hard hyphens; be sure soft hyphen entry (^OE) is OFF before entering them; check the ^O menu if not sure.)

Leaving the cursor anywhere in this line, type ^OF. The desired tabs and margins will be set, and all other tab stops cleared. To keep the ruler line from appearing in the printed document, turn it into a "comment" dot command (a line beginning with two periods).

For example, to set tabs at columns 10, 20, and 30, set the left margin to 5, the right margin to 50, and clear any other tabs between columns 5 and 50, enter the following into the file, then use ^OF:

```
-----|-----|-----|-----
```

To keep the ruler in usable but non-printing form in the file, so that the tabs can be reset to these values whenever you wish to edit the table to which they apply, make the ruler an OVERPRINT line in a comment dot command line: position the cursor at the beginning of the line, turn insertion on, insert two periods, then type ^P and RETURN (^PM also works).

For the above example, such a ruler should appear on the screen as follows. Note the "-" in the rightmost column of the "comment" line. (This is an overprint flag, not a hyphen.)

```
|.. -----|-----|-----|----- -|
|<
```

This gets the .. out of the ruler while still suppressing printout of the ruler. To use the ruler, position the cursor in the ruler (not in the blank comment line), and type ^OF.

Ruler lines are usually unnecessary for text other than tables, since the ^OF command responds to any non-blank characters and the tab stops often don't matter.

In summary, to enter a non-printing, reusable ruler line, position the cursor at the beginning of a line. Type ^N if necessary, to make a blank line ending in a RETURN. Type two periods, ^P, RETURN, space over to the desired left margin, then type hyphens to the desired right margin, except !'s at columns where tab stops are desired (or #'s for decimal tab stops, described in the next subsection). Type ^OF to make the tabs and margins specified by the ruler take effect.

Decimal Tabs

Decimal tabbing provides a quick and easy way to enter columns of numbers with the decimal points aligned, and to enter other text requiring right-alignment rather than the left-alignment produced by regular tabs. After you tab to a decimal tab stop, characters entered will move to the left, pushing the entire field over to maintain right-alignment to the tab stop column. The cursor remains at the tab stop. When a period is typed, this right-aligning action terminates; the cursor will move right if additional characters are entered.

Right-alignment also terminates when the RETURN key or the space bar is pressed, when the TAB key is pressed again and the next tab stop is not decimal, or if the cursor is moved out of the field. It is possible to move the cursor around within the "field" (the non-blank characters left of the tab stop) and make corrections; right-alignment will not terminate and WordStar will keep the field properly aligned as characters are inserted and deleted, provided that the cursor is kept within the field. Whenever right-alignment is in effect, the word decimal appears in the status line.

Decimal numbers entered under decimal tab will be aligned with the decimal point in the column at which the tab stop was set. Texts not containing decimal points or periods (or spaces), if entered under decimal tab, will be aligned with the last character one column to the left of the tab stop.

Decimal tab stops can be set by using either of the methods for setting tab stops. With the ^OI command, type a # before typing the column number or pressing the ESCAPE key. When using a ruler, type a # instead of an ! at the tab stop column. The specified column should be the column in which you wish the decimal points to appear, or the column **after** the column in which you wish text not containing periods to end.

To edit text previously entered in a decimal tab field, make sure a decimal tab stop is still set at the proper column, turn insertion off (^V), and bring the cursor to the tab stop **with the tab key**. This will restore right-alignment and make the word **decimal** appear in the status line. You may then move the cursor around as desired within the field and delete, replace, or insert characters as desired. (Once you have tabbed to the field, you may then turn insertion back ON again.) WordStar will maintain the alignment by moving the characters in the field to the left of the cursor—left or right as required.

If you fill up a decimal field by entering enough characters to fill all the blank space to the left of the cursor, right-alignment will cease until you delete the excess characters.

Decimal tabbing is only active when variable tabbing is ON (the default). To verify, press ^O and check the menu; ^OV turns variable tabbing ON.

As with regular tabs, no permanent record of the decimal tab columns is made in the file. You must reset the tab stops before entering additional information or editing text previously entered (with automatic right-alignment).

Note

You may wish to use a comma or some other character in place of a period to terminate "decimal" tabbing. WordStar has a provision for changing the "decimal point" character; see the list of patch items in the **Installation Manual**. If you have a European version of WordStar, the "decimal point" may already have been changed to a comma.

Text Wider Than the Screen

WordStar is not limited to the screen width in forming text. Users with wide printers, narrow screens, or who are preparing copy for photo-reduction can format text to widths up to 32,000 columns. There is no length limit for a manually formed line. However, if you are planning to type very long lines, remember that you should try to confine text manipulation to columns 1-240. Some WordStar functions do not work effectively beyond column 240.

Overprinting Characters

The strikeover character, entered by typing `^PH` and displayed as `^H`, provides a way to print two (or more) characters in the same position. For example, to print "à" as required in French, it is necessary (on a printer with regular ASCII characters only) to print an "a" and a "`" in the same position. This is accomplished by entering "`", backspace, "a" into the file. Type

```
  `^PHa          ( ` CTRL-P H a)
```

Screen display: `^Ha` On paper: `à`

As another example, typing

```
  H^PHI^PHN^PHZ  (H  CTRL-P H  I  CTRL-P H  N  CTRL-P H  Z)
```

will display

```
  H^HI^HN^HZ
```

and will print an H, an I, an N, and a Z in the same position

■

producing the symbol used in this manual to represent the cursor.

Overprint Lines

One or more document lines which print **on the same line** can be used for special effects. For example, another way to make the cursor symbols ■ used in this manual is to overprint an H, an I, an N, and a Z in the same position, using three overprint lines to print the I, N, and Z over the H.

When an overprint line follows a dot command, it is considered part of the dot command and is not printed. You can take advantage of this feature to keep "rulers" for setting tabs and margins with the `^OF` command in the file in a form that will not print, but may be used with `^OF`.

Overprint lines are entered by typing the first line, then typing a `^P` before the `RETURN` at the end of the line, then typing the line that is to print over. To overprint a third line, type `^P RETURN` again and type another line. The `^P RETURN` sequence enters a carriage return without line feed into the file. Each screen line that will be overprinted by the following screen line will show a "-" flag in its rightmost column.

Section 5 Finding Text

PLACE MARKERS

Place markers provide a convenient means of remembering one or more positions in the document and for moving the cursor back to any one of these positions later. Place markers are not stored in the file and are remembered only for the duration of an edit. Previously entered place markers are not known if the file is edited again later, although they do last through a "save and resume" command (^KS). The commands for handling place markers are shown in Table 5-1.

Table 5-1. Place Marker Commands

<u>Command</u>	<u>Description</u>
^K0-9	Set Place Marker. The marker indicated (0-9) is set to the cursor position. If the marker has already been set to this position and displayed, it will be undisplayed (but still set); otherwise it will be displayed as <n>.
^Q0-9	Move to Place Marker. The cursor is moved to the specified place marker (0-9). If the marker is hidden, it will be displayed; if the marker has not been set, an error message will be displayed.

There are ten place markers, numbered 0 through 9. Initially, all are "unset." Any attempt to move the cursor to an unset place marker will produce an error message.

A place marker can be **set** to the current cursor position by typing ^K followed by one of the digits 0 through 9. The marker will then be displayed as <n> highlighted, at the set position, where n is the number. The marker display <n> is not actually in the file; cursor motion commands will skip over it.

The cursor can be **moved** to any place marker already set by typing ^Q followed by the number. The usual caution about long backward moves in extremely long documents applies (Section 6).

If the cursor is already at a place marker, a place marker can be **hidden** (removed from the screen display) by typing ^K followed by the number. The position of the marker will still be remembered; if it is subsequently accessed (^Qn), it will reappear.

The beginning of block marker, and the end-of-block marker, <K> can also be set, hidden, and moved to in a similar manner (typing B or K instead of a digit); these markers will be discussed further in Section 6.

FIND AND REPLACE

The commands used for Find and Replace are shown in Table 5-2, followed by detailed directions on how to use these commands.

Table 5-2. Find and Replace Commands

<u>Command</u>	<u>Description</u>
^QF	Find a String. Asks for a string to find. If you press ESC after typing the string, moves cursor beyond the next occurrence of string; if you press RETURN after typing the string, ^QF allows for options.
^QA	Find and Replace. Asks for a string to find, a string to replace it with, and options. If no options are given, the next occurrence of the find string after present cursor position is displayed and you are asked REPLACE (Y/N); if you type Y, replacement is performed.
^L	Find or Replace Again. The last Find or Replace command (whichever was more recently used) is repeated as though entered again with the identical response to all questions.
^QV	Restore Cursor. After a Find, Replace, or ^L command, moves cursor to its position before this command, or to the starting point of the last iteration if a repeat count or the G option was included in the command. Particularly useful after NOT FOUND errors.

Note

If certain other commands have been entered, ^QV has a different meaning (see description above in Section 3).

Introduction

The Find command (^QF) provides a convenient way to move the cursor to a desired place in the file, without inspecting the entire file on the screen. Used in conjunction with the "Find/Replace again" command (^L), it also provides a convenient way to find all occurrences of a given word, phrase, or other string of characters. Use "Find" to find the first occurrence; observe it on the screen, and make changes if desired; then press ^L to advance the cursor to the next occurrence.

The Replace command (^QA) provides a convenient way to replace one word, phrase, or other string of characters with another word, phrase, or string, without explicitly positioning the cursor, deleting the old text, and typing in the new. By specifying the "global" option, you can replace all occurrences in the entire file with a single "Replace" command. Before actually making the substitution, Replace displays the text found and asks whether to replace it in this instance. This permits selective replacement. The asking can be suppressed for rapid substitution if desired.

The "Find/Replace Again" command (^L) may also be used to repeat a "Replace" command, allowing other editing commands to be used between replace's without re-entering the entire Replace command each time.

Replace has a number of convenient additional uses, such as inserting a commonly used string with a keystroke; several of these are described under the heading "Hints for Using Find and Replace" later in this section.

Basic Use of Find

Find is initiated by typing ^QF. WordStar then asks:

FIND? ■

This question appears below the menu, moving the top of the file display area down one line. Respond by entering any sequence of characters you wish to locate (the find string). then press RETURN. The find string may be a word, a phrase, a partial word, or any other string up to 30 characters. WordStar then asks:

OPTIONS? (? FOR INFO) ■

For now, just press RETURN; we will discuss this question shortly.

WordStar then searches forward through the file from the location of the cursor to the next occurrence of your find string. When a find occurs, the cursor is left after the last character of the string, the screen is redisplayed, and the command is complete. If the find string is not found, the cursor is left at the end of the document and an error message appears:

*** NOT FOUND *** "<your find string>" *** Press ESC Key *** ■

For example, suppose you have just started editing a document (cursor is at beginning of file) and you wish to move the cursor to the first place where the words "Section II" appear. Enter ^QF, then answer the questions thus (you type underlined text):

FIND? Section II RETURN OPTIONS? (? FOR INFO) RETURN

The basic Find command looks only for an **exact match** for the characters you enter as the find string: the above example would not find "Section II" (two spaces between words) or "section II" (lower case S).

The basic Find command will also locate the search string even if it is imbedded in other words. The above example would also find "Section III" if it occurred before "Section II"; an attempt to find "age" would also find the "age" in "page" or "agent" if one of these occurred first. Handling such an unwanted match is simple: just type ^L, and WordStar will repeat the Find, starting from the current cursor position and thus finding the next match.

Options described later in this section can modify the exact match rule.

Find ignores the distinction between hard and soft spaces and carriage returns.

If the find string is null (RETURN only entered), the cursor will not be moved. This lets you cancel an unwanted Find command by pressing RETURN in response to each question.

Basic Use of Replace

"Replace" does a "Find", then substitutes another string of characters for the find string, as specified.

Replace is initiated by typing ^QA. WordStar asks "FIND?" as for the Find command; after you have entered the find string, it asks:

REPLACE WITH? █

Type whatever you want substituted for the find string. WordStar then asks "OPTIONS?" as described above; respond by pressing RETURN only for now.

WordStar then searches for the find string, as described above. If it is not found, a NOT FOUND error occurs and the cursor will be at the end of the document. If found, text in the vicinity of the find is displayed on the screen and

REPLACE (Y/N):

appears in the status line. The cursor flashes back and forth between the string found and the question in the status line. If you want the substitution performed, type Y (y and ^Y also work). If not, press any other key.

To repeat the Replace command from the new cursor position with the same answers to all three questions, type ^L.

For example, to replace the next occurrence (after the cursor) of "Jones" with "Smith", you would type ^QA and answer the questions as follows:

FIND? Jones RETURN REPLACE WITH? Smith RETURN OPTIONS? RETURN

Find and Replace Options

The "OPTIONS?" question asked by Find and by Replace can be answered with one or more of the letters G, N, W, U, or B (in upper or lower case) a number between 1 and 65535, or a combination of these. Also, ? can be entered to request a menu summarizing the options, followed by reasking OPTIONS?. Terminate your answer by pressing the RETURN key.

The effect of each of these options is shown in Table 5-3

Table 5-3. Find and Replace Options

Option	Description
n	Number (n). Do the Find or Replace n times. For example, when used with Find, it means find the nth (say fourth) occurrence of the string. When used with Replace it means replace the next four occurrences. The number may be more than one digit. NOT FOUND error occurs if command cannot be performed that many times; as many Finds or Replaces as possible will have been done.
G	Global Search. Do Replace on the entire file: move cursor to the beginning of the file, then replace repeatedly (asking each time) until no more occurrences are found. NOT FOUND error occurs only if no occurrences at all found. Cursor is left at the end of the file. If used with Find, finds the last occurrence in the file.
N	Automatic Replace. Replace without asking--convenient with G if you are sure there will be no undesired matches.
B	Backward Search. Search backward instead of forward from current cursor position. If NOT FOUND error occurs, cursor will be at beginning of file. If used with G, Finding or Replacing starts at end of file and proceeds to beginning.
U	Ignore Upper/Lower Case. Ignore the distinction between upper and lower case in the Find string; makes "age" also match "Age" or "AGE", etc. May be used with either Find or Replace.
W	Whole Word Search. Match on whole words only. Find or Replace only those occurrences of the find string that have a non-letter, non-digit character before and after them. Makes "age" NOT match "page" or "agent".

Note

W will not find occurrences of the Find string at the very beginning and end of the file; there must be at least one character (any character, including space, carriage return, etc) before and after the string.

One more point about the **OPTIONS?** question: if you end your entry to the preceding question (**FIND?** for the Find command, **REPLACE WITH?** for the Replace command) by pressing the **ESCAPE** key instead of the **RETURN** key, the options question will not be asked.

In the following examples of Find and Replace options, typed entries are underlined:

o **FIND?** Jones **RETURN** **OPTIONS?** (? FOR INFO) 13 **RETURN**

Finds the 13th occurrence of "Jones" after the present cursor position.

- o FIND? section RETURN OPTIONS? (? FOR INFO) wub RETURN

Finds previous (b) occurrence of "section" as a separate word (w), in either upper or lower case (u). Will find "section" or "Section" or "SECTION", but not "dissection" or "sectional" or "sub-section".

- o FIND? John Jones RETURN REPLACE WITH? James D. Smith RETURN

OPTIONS? (? FOR INFO) gn RETURN

Changes all (g) "John Jones"s in the document to "James D. Smith", without asking the operator whether to perform each substitution (n).

- o FIND? carraige RETURN REPLACE WITH? carriage RETURN

OPTIONS? (? FOR INFO) gn RETURN

Similarly correct the misspelled word "carriage" throughout the document.

Special Characters in the Find String

The control characters shown in Table 5-4 may be used in your response to the FIND? question (in either the Find or the Replace command) to match various classes of characters:

Table 5-4. Special Find Characters

Character	Description
^A	Matches any single character. (To enter ^A into the find string, type ^P^A.)
^S	Matches any character not a letter or digit. (Since ^S alone is used to delete a character from the string being entered, you must type ^P^S to enter a ^S in the find string.)
^Ox	Matches any character other than x, where x is any character entered immediately after the ^O.
^N	Matches the sequence "carriage return, line feed" (which is what is normally stored in the file between lines). The distinction between hard and soft carriage returns is ignored.

^N also works in the answer to the REPLACE WITH? question. When used in the latter case, it produces a "hard" carriage return.

In addition, the question-response special characters described in Section 5 may be used: ^S, ^D, and ^Y to correct typing errors, ^P to put any control character into the string, ^R to restore the previous answer, etc.

Examples showing use of the special characters in Table 5-3:

- o FIND? ^NSection II RETURN OPTIONS? (? FOR INFO) RETURN

Finds "Section II" at the beginning of a line only.

- o FIND? ^N RETURN OPTIONS? (? FOR INFO) 50 RETURN

Finds the 50th carriage return after the cursor line, that is, moves forward 50 lines in the file. If cursor is at beginning of file when this command is given, then it finds the 51st line.

- o FIND? ^N^N RETURN OPTIONS? (? FOR INFO) RETURN

Finds the next blank line (two adjacent carriage returns) and leaves cursor on following line.

- o FIND? X^A^AX RETURN OPTIONS? (? FOR INFO) RETURN

Finds the next occurrence of two X's with any two characters between them, for example "XABX", "X1,X", "X +X", etc.

- o FIND? ^N RETURN REPLACE WITH? |^N| RETURN
OPTIONS? (? FOR INFO) 13n RETURN

Without asking, change the next 13 carriage returns to "|", carriage return, "|"; that is, add a | to the end of the current line and the next 12 lines, and insert a | at the beginning of the next 13 lines. This form of command is useful in forming boxes around tables.

Note

In using the special find string characters, you must be aware of the fact that what is normally thought of as a "carriage return" between lines is actually **two** characters, a carriage return and a line feed; this fact impacts the use of ^A and ^S in the middle of a find string.

Finding and Replacing Soft Hyphens

As noted in Section 4, a "soft hyphen" is a special character at which a word may be split between lines. Soft hyphens are not printed unless left at the end of a line by word wrap or paragraph reform (^B).

If you turn soft hyphen entry ON (^OE), then pressing the "-" key, while answering the FIND? or the REPLACE WITH? question, will enter a soft hyphen into the answer. This permits searching for soft hyphens and adding soft hyphens to text using the Replace command. The Find command treats all soft hyphens the same, whether or not they are active (set to print). Soft hyphens added to text with the Replace command are initially inactive; they will not print unless subsequent line forming places them at the end of a line.

For example, the Replace command could be used to change all occurrences of the word "microcomputer" to "micro-com-puter". The -'s will be soft hyphens (and display highlighted) if soft hyphen entry (^OE) is on when ^QA is typed

to initiate the Replace command. The soft hyphens thus added to the file will initially be non-printing; they will serve to tell ^B and word wrap where the word may be hyphenated in later line-forming. Usually, after adding soft hyphens, you will want to reform the affected text with ^B to activate the soft hyphens.

When soft hyphen entry is on, you may press ^P then - to enter a hard hyphen (one that always prints).

Hints for Using Find and Replace

FINDING A LONG STRING

Usually it is handiest to type only part of the string (maybe 5 or 10 characters) in response to the FIND? question; if this results in finding the wrong thing, press ^L to proceed to the next occurrence.

RESTORING THE CURSOR

To restore the cursor to the starting point after a NOT FOUND error, type ^QV.

GLOBAL REPLACE

Here are two approaches to making a global replace:

- o Use the G option, with N if selective replace not desired.
- o Move the cursor to the beginning of the document (^QR) and execute a Replace command for a single replacement only. This will take care of the first occurrence; then type ^L to proceed to the next occurrence.

The second method lets you use other editing commands as desired between replaces, yet initiate the next Replace with a single keystroke.

ACCELERATING GLOBAL REPLACE

Normally, Replace displays each substitution, even if the N option in conjunction with the G option or a number (n) is in use. This screen updating accounts for most of the Replace command's execution time. If you press any key while such a command is executing (choose a harmless key, such as "cursor up"), WordStar's normal suppression of screen updating when another key has been entered will take effect, and the Replace will complete **much** faster.

STOPPING GLOBAL REPLACE

As just noted, a key pressed during a global Replace or a Replace with a number (n) will suppress display of the ongoing changes while **accelerating** execution. Thus, if you have such a command in progress and you notice it is having an undesired effect on your document, use only the interrupt key (^U) to stop it.

CAUTION WITH LARGE FILES

As detailed in Section 6, commands that move the cursor a long way backwards should be used with caution in large files because of long processing time, and since they can lead to a DISK FULL error because of the temporary file space used. Instead, saving with ^KS is recommended to move the cursor to the beginning of the file. This applies to the G option; in a large file, if the cursor is not near the beginning of the file, execute a ^KS before starting a global replace. Similarly, type ^KS before using the ^QV command in a large file if the cursor is currently far beyond the starting point.

REPLACING TO END OF FILE

To replace all occurrences of a string from the present cursor position to the end of the file, respond to the OPTIONS question with a large number (n), such as 9999. All occurrences forward from the cursor will be changed, then a NOT FOUND error will occur. Using a large number (n) differs from using the G option in that the cursor is not moved to the beginning of the file first (as it is with the G option).

CANCELLING A COMMAND

To cancel an unwanted Find or Replace command, do one of the following:

- o enter RETURN only for each question
- o type ^U, the interrupt command

STOPPING A FIND OR REPLACE

To stop a Find or Replace in progress, type ^U, the interrupt character. An INTERRUPTED error will occur; the cursor will have been advanced to a random position. This is most useful after a typing error in the find string prevented finding something you thought was nearby, e.g., on the screen. With a long file, such an error will be indicated by the fact that instead of completing in a second or two, the command continues processing and WAIT appears in the status line. Stopping the command before it searches to the end of the file reduces the time to get the cursor back to the starting point.

USING A SINGLE KEYSTROKE

To use a single keystroke for a commonly-used insertion, use the Replace command with a null (RETURN only) find string, then the desired string as the replace string, and the N option. This will insert the Replace string at the cursor position. Each time you press ^L, the string will be inserted again at the current cursor position.

FINDING AND DELETING A STRING

To find and delete a string, use the Replace command with a null replace string (RETURN only). This will advance the cursor to the next occurrence of the find string, and replace it with nothing (i.e., delete it). Press ^L to repeat.

CONVERTING A NON-DOCUMENT

To convert a file from a non-WordStar source so that its paragraphs can be reformed, you must change all carriage returns within each paragraph to spaces, then reform (they will all be "hard"). Position the cursor at the beginning of the first paragraph to be converted. Enter ^QA and (user entries are underlined):

```
FIND? N RETURN  REPLACE WITH? _ RETURN  OPTIONS? (? FOR INFO) N RETURN
```

Note that a space was entered for REPLACE WITH?. The above will change the first carriage return to a space, joining the first and second lines, and leave the cursor at the beginning of what was the second line. Type ^L's until all carriage returns in the paragraph except the last one are removed. At this point, the paragraph is all one document line. Move the cursor to the beginning of the paragraph (no cursor motion is necessary if right margin is set to 1, since paragraph is now all one line), type ^B and then stand back! A marginated and justified paragraph, with the cursor at the end!

Cursor down to the next paragraph (the cursor will already be in the correct place if there are no intervening blank lines) and repeat the process, using the single keystroke ^L to remove each undesired carriage return, ^B to form each paragraph and cursor down to pass those carriage returns you want to keep.

REPEATING A FIND OR REPLACE

To repeat a Find or Replace already typed, just press ^L.

USING THE PREVIOUS RESPONSE

Suppose you want to repeat the previous Find command, but with different options. Suppose the find string was long and tedious to type. Type ^QF, then respond to FIND? with a ^R. The previous find string will be displayed. Press RETURN to keep the old answer; OPTIONS? will then be asked as usual. Minor changes may be made in the answer by backspacing (with ^D, ^H, or BACKSPACE), retyping the desired characters, then using forward cursor (^D) or ^R to restore the rest of the string before pressing RETURN.

This method of resurrecting the old answer to the same question also works with the REPLACE? question, the OPTIONS? question, and other WordStar questions whose prompt ends in ?. Section 1 gives more description of question-response control characters.

Section 6 Other Editing Features

BLOCK OPERATIONS

The block move, block copy, and block delete commands give WordStar a powerful and easy-to-use "electronic cut and paste" ability. The commands used to carry out block operations are shown in Table 6-1.

Table 6-1. Block Commands

<u>Command</u>	<u>Description</u>
^KN	Column Mode ON/OFF. The setting for this toggle determines whether any blocks you mark are to be interpreted by WordStar as column blocks or ordinary margin-to-margin blocks.
^KB	Mark Block Beginning. Set block beginning marker to cursor location, or hide marker if already set and displayed at cursor position.
^KK	Mark Block End. Set or hide block end marker <K>.
^KV	Move Block. Currently marked block of text is moved to the cursor position. Block markers move with text.
^KC	Copy Block. Currently marked block of text is copied at cursor position. Original text not changed; block markers move with copy.
^KY	Delete Block. Entire currently marked block of text is deleted from document.
^KW	Write Block. Asks for a file name, and writes currently marked block of text to that file. Text in document being edited is not changed.
^KH	Hide Block. Block marking is undisplayed if currently displayed, or displayed if currently hidden.
^QB	Move to Block Beginning. Cursor moves to block beginning marker; this marker is displayed if hidden.
^QK	Move to Block End. Cursor moves to block end (similar to ^QB).
^QV	Move to Block Source. Cursor moves to position of beginning marker before last block move, block copy, block delete, or block write. Use to inspect place text moved from. (The ^QV command has a different meaning if a Find or Replace has been executed since the last block operation (see Section 5).)

Note

Currently, you cannot use micro-justification with columnar-formatted material. For correct printing of text columns, enter .UJ OFF before the columns and .UJ ON following the columns. (See page 4-10, Section 8, and Section 3 for more information.)

Examples of Block Operations

Suppose you wish to move a paragraph of text to a different position in the document being edited. Proceed as follows: Place the cursor at the beginning of the paragraph to be moved. Type `^KB`. This "marks" the beginning of the "block" to be moved; `` will appear on the screen to indicate the position of the beginning marker. Move the cursor to the beginning of the line after the paragraph, and type `^KK` to "mark" the end. On a terminal with highlighting, the marked block will now show dim or in inverse video; on other terminals, `<K>` will be displayed at the end marker position. Now move the cursor to the desired destination, and type `^KV`. The marked paragraph, including the markers, will move to this position and appear on the screen.

As a second example, suppose you wish to move a sentence from within a paragraph to a different position. Proceed in a similar manner, marking the beginning (`^KB`) and end (`^KK`) at any desired positions, whether or not in the middle of lines. Then position the cursor at the desired destination, which may also be in the middle of a line (as between two sentences), and type `^KV` to invoke the move. After moving the sentence, you will usually need to "reform" the source and destination paragraphs with the `^B` command for margin realignment. Also, depending where you set the begin/end markers, there may be too many or too few spaces before or after the moved sentence, or where the sentence came from. This can easily be corrected with a few editing commands.

The block copy command, `^KC`, is similar except the marked text is not deleted at the source; the block delete command, `^KY`, deletes the entire marked block; and the block write command, `^KW`, copies the marked text onto a **separate file** (more about this later in this section under "Additional File Commands"). Related commands include block hide/redisplay, which eliminates and restores the display of the block markers*(or the highlighting of the entire block) from the screen, and `^QV`, which, if issued after a block move or copy, moves the cursor to the place where the block came from.

For a quick listing of the block commands while editing, type `^K` and wait for the menu to come up; then clear this menu by pressing the space bar. Type the help command `^JV` to display a summary of the process of moving a block.

We will now describe the block commands in more detail. If this is your first reading of this manual, you may wish to skip to the next section, and come back here when you need a better understanding of the block commands. Since the block move, copy, delete, and write commands all operate on the current marked block of text, we will detail block marking first.

Marking a Block

A block is marked by placing the cursor at the desired beginning point and typing `^KB`, and placing the cursor at the desired end point and typing `^KK`. These commands work like the place marker commands (previous section): if the cursor is already at the indicated marker and the marker is displayed, it will be hidden (removed from the screen display).

The beginning and the end can be marked in either order, with any other intervening commands, and will remain in effect until reset whether used or not. For example, you can mark a block, then edit the text within the block. If the block is later block-copied, the copy will reflect all the changes.

The markers may be moved as desired. For example, if you execute another "mark end" (^KK) to correct the position of the end marker, it is not necessary to mark the beginning again.

To remember the block beginning and end commands, note that the word **Block** begins with a **B** and ends with a **K**.

ORDINARY TEXT BLOCKS

If the last line in the block you intend to mark is a complete line, we recommend placing the end marker at the beginning of the next line to include the carriage return at the end of the last line. The beginning and end markers may be set in mid-line to extract a sentence from the middle of a paragraph. All lines between the lines containing the markers are always included in their entirety.

COLUMN BLOCKS

If you are preparing for a column move, type ^KN before setting markers to set the system for column mode. Then type ^KB and ^KK as described above, except that you must place ^KK one space to the right of the end-point. The only difference will be how WordStar interprets these markers: they will define on the screen a rectangle whose upper left-hand corner is and whose lower right-hand corner is <K>. On subsequent block operations, this rectangle will be what WordStar moves, copies, or deletes.

How the Marked Block Is Displayed

On terminals with highlighting (inverse video or high and low intensity) for which WordStar has been installed, the entire marked block is displayed highlighted, with no or <K> shown. This makes it easy to see what text is marked. The spaces on the screen after the end of the last line in the block, and the flag character (< for hard carriage return) in the last line, are included in the highlighted area only if the end marker is after the carriage return at the end of that line.

A marked block will **not** appear highlighted in the following instances:

- o the beginning marker is after the end marker, or at the same place
- o only one of the markers is set and displayed
- o the terminal has no highlighting capability,

On terminals without highlighting, for ordinary margin-to-margin blocks, the beginning marker will display as and the end marker will display as <K>; for column blocks, the beginning marker will display as a column of s and the end marker will display as a column of <K>s.

Hiding and Redisplaying the Block

A command is included for convenience to hide or redisplay the marked block. ^KH hides the beginning and end markers (or "un-highlights" the marked block, if that mode of display is in use); if the display is already hidden, ^KH restores the display.

Unlike the place marker commands (which will operate on and display a hidden marker), block operations cause an error if the marked block is currently hidden. This protects your document against accidental block commands. If such an error occurs when you wanted the block operation to be performed, type ^KH and repeat the command.

Moving a Block

The block move command (^KV) **moves** all the text in the marked block to the **cursor position**, deleting the original at its old position. If no block is marked when the command is given, or if either marker is hidden, an error message occurs (Appendix B).

The destination may be in the middle of a line, if desired — for example when rearranging sentences in a paragraph. Just put the cursor where you want the block moved to. The cursor is left at the beginning of the moved text.

The beginning and end markers **move with the block** and remain displayed. After inspecting the result, type ^KH to hide the block markers -- both to remove the distraction from the screen, and to protect against block commands typed by accident. If you wish to use the same block markers later, just type ^KH again.

The block move command moves **exactly** the characters you have marked, and does no automatic reformatting. Thus, text reformatting is often required after a move. After rearranging sentences, for example, use paragraph reform (^B, Section 4) to re-establish the margins. You may also notice that you included too many or too few spaces or carriage returns at the beginning or end of the block. These errors are easily corrected with a few regular editing commands.

After a block move, the command ^QV will move the cursor to the place the block came from. It's a good idea to inspect here after moving, as you may have left too many spaces or carriage returns behind, or you may need to reform the paragraph. Note that any place markers 0-9 in the marked block do **not** move with it—they remain at the place the block came from.

For an example of moving a column block, see Figure 6-1.

A	BB	CCCC	■DDDDDDD	A	CCCC	BB	DDDDDDD
A	BB	CCCC	DDDDDDD	A	CCCC	BB	DDDDDDD
A	BB	CCCC	DDDDDDD	A	CCCC	BB	DDDDDDD
A	BB	CCCC	DDDDDDD	A	CCCC	BB	DDDDDDD
A	BB	CCCC	DDDDDDD	A	CCCC	BB	DDDDDDD

Figure 6-1. Moving a Column Block

Copying a Block

The block copy command (^KC) is identical to the block move command except the text is **not** deleted at the source; a copy of it is made at the cursor position. The cursor is left at the beginning of the new copy of the text. Again, the block markers move with the text.

Several copies of a block of text may be made, one after the other, by typing ^KC several times in succession. Copies may be made in different places by moving the cursor between copy commands. Each copy is made from the previous one if you don't alter the markers; so make any desired copies of the text in its current form before altering it.

For an example of copying a column block, see Figure 6-2.

A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	BB	CCCC	BB	DDDDDDDD

Figure 6-2. Copying a Column Block

Deleting a Block

The block delete command (^KY) is a convenient way to remove a large quantity of text from a file. It is also dangerous; the existence of this command is one of the reasons why you should hide a marked block (^KH) when done with it.

Block delete leaves the beginning and end markers both hidden and set to the position the text was deleted from. The cursor is not moved; however, the ^QV command may be used after ^KY to move the cursor to the position of the deletion.

For an example of deleting a column block, see Figure 6-3.

A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD
A	BB	CCCC	DDDDDDDD	A	CCCC	DDDDDDDD

Figure 6-3. Deleting a Column Block

Writing a Block to a File

The block write command asks for a file name and writes the text in the marked block to that file. This permits extracting a segment of text from one document and saving it as though it were a different document. Uses of this command include moving sections from file to file and moving blocks within large files; block write and related commands are further discussed in the "Additional Files Commands" later in this section.

Block write does not move the cursor, and does not alter the text in the document currently being edited. If a file with the specified name already exists, WordStar will ask

FILE d:filename EXISTS -- OVERWRITE? (Y/N): █

If, in response to the above prompt, you type Y, WordStar will proceed with the block write, destroying any previous contents of the specified file. If you type N, WordStar will ask you again for the file name.

Column Block Operations

When you move text in block mode, the carriage returns move along with the block of text. In column mode, this isn't so. When you move a column composed of lines ending in carriage returns, a block of blank lines will remain in their place. To remove the gap in your document, you will have to delete these blank lines.

You cannot use the command ^KY (Delete block) to delete blank lines while you're in column mode, because column move, copy, and delete commands do not affect carriage returns. So, to eliminate the blank lines, enter the command ^KN to return to block mode, mark the block of blank lines, and delete them with ^KY.

Also, you cannot use ^KR or ^KW in column mode, to read or write a column of text to or from another file.

Column mode does not change the way you use WordStar to enter text or edit within a column. For example, it doesn't allow you to word wrap or justify columns. All text entry and edit operations will still affect your text from margin to margin, whether or not you are in column mode.

You should keep this principle in mind when you use print control characters (for underlining, boldfacing, or doublestriking, for example) in columns. You need to make sure the print control characters begin and end on each line of the column you want to be affected.

For instance, if you are creating a table of several columns, and you want the first three lines of the first column to be boldfaced, you can't just use the ^PB command (for boldface) at the beginning of the first line and the end of the third line. If you do, the first three lines of each column will be boldfaced.

Instead, use the ^PB command at the beginning and end of the first three lines of the first column.

NO

This:

```

^Bxxxxxxxxx      xxxxxxxxxxx
xxxxxxxxx        xxxxxxxxxxx
xxxxxxxxx^B      xxxxxxxxxxx
xxxxxxxxx        xxxxxxxxxxx

```

produces this result:

```

XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX

```

YES

This:

```

^Bxxxxxxxxx^B    xxxxxxxxxxx
^Bxxxxxxxxx^B    xxxxxxxxxxx
^Bxxxxxxxxx^B    xxxxxxxxxxx
xxxxxxxxx        xxxxxxxxxxx

```

produces this result:

```

XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX
XXXXXXXXXX      XXXXXXXXXXX

```

The Limit on Block Length

There is limit to the amount of text that can be block-moved, or block-copied at a time. The limit varies depending on the amount of RAM the system has available. If the block is too long, the command will result in a BLOCK TOO LONG error message. When this message occurs, repeat the operation with two or more commands each operating on half (or less) of the text.

Caution with Long Documents

Block move, block copy, block delete, and block write all involve moving the file cursor (internally—not visible on screen) to the location of the marked block, then back to the original position. If the cursor is a long way from the marked block, the command will execute very slowly and run the risk of a DISK FULL because of the work file space used (as discussed in "Long Documents" later in this section). For moving and copying text when the source and destination are far apart, it may be easier to use the block write command and the additional file read command (Section 6).

ADDITIONAL FILE COMMANDS

The commands described in this subsection relate to use of files other than the file being edited. Common applications of these commands include merging documents, extracting a section to form a separate document, assembling a document from previously prepared sections, and "cut and paste" within a document.

The files operated on by these commands and the files operated on by editing are interchangeable. You can extract a portion of one document with the block write command, then later edit the resulting file or you can merge a document previously entered by editing operations into another with the read additional file command, and so on. The commands are shown in Table 6-2, with discussions following.

Table 6-2. Additional File Commands

Command	Description
^KW	Write Block. Asks for the file name, and writes the marked block of text into that file (as described in the previous subsection). Document currently being edited is not altered.
^KR	Read File. Asks for file name, and inserts the entire contents of the indicated file into the current document at the cursor position . The file read may have been created with the block write command, or through the normal editing process--such files are interchangeable.
^KJ	Delete File. Asks for file name, then erases the file. Space occupied by file is made available for reuse. Similar to the no-file menu Y command, Section 1.
^KL	Change Logged Disk. Changes disk drive for filenames entered without a disk drive name, and disk drive whose directory is displayed. Similar to the no-file menu L command.
^KF	Directory ON/OFF. Turns on and off display of the file directory during editing. Similar to the no-file menu F command.
^KP	Print File. Invokes printing of a document (See Section 8). Similar to the no-file menu P command.
^KO	Copy File. Makes a copy of a file in another file. Similar to the no-file menu O command.
^KE	Rename File. Changes the name of a specified file. Similar to the no-file menu E command.

Entering the File Name

Several of the commands in Table 6-2 ask for the name of the file to which the command is to be applied. Type in the desired file name and press RETURN. Control characters are available to correct typing errors in the answer or recall the previous answer to eliminate the need to retype; at help levels 2 and 3 the following reminder of the more commonly used control characters appears above the NAME OF FILE? question (see Section 1):

^S=delete character ^Y=delete entry ^F=File directory
^D=restore character ^R=Restore entry ^U=cancel command

DIRECTORY DISPLAY (^F)

To view the file directory temporarily while entering a file name for an additional file command, type ^F at the NAME OF FILE? question. The names of the files on the logged disk drive will be displayed until RETURN is pressed; ^Z and ^W may be used as necessary to scroll the directory display up or down to permit viewing all file names. (To request a directory display that remains on the screen, rather than disappearing upon completion of the command, use the ^KF command).

REPEATING FILE NAME (^R)

To enter the same file name as used in the last additional file command given, just type ^R to the NAME OF FILE? question. The previous name will appear on the screen; press RETURN to use it. This saves keystrokes and eliminates the need to remember the exact file name used, as from a block write command to subsequent read and delete commands for the same file. The NAME OF FILE? question of the block write, read additional file, and delete file commands differ from most questions in WordStar in that a single previous answer is stored for all three of them.

Common Uses of Additional File Commands

STANDARD TEXT (BOILER PLATE)

When you have standard paragraphs or sections that you frequently use, enter each into a separate file. Then use the ^KR command whenever desired to copy one of these paragraphs or sections from the separate file to the cursor position in a document you are editing. (Alternately, the MailMerge .FI dot command may be used to insert the boiler plate files while printing is being performed. The optional MailMerge command is described in Sections 9-12.)

After copying a "boiler plate" file into the document being edited, the Replace command (Section 5 above) may be used to assist in inserting names, addresses, or other information that changes with each use of the boiler plate. More flexible and powerful insertion facilities are provided by the optional MailMerge command, described in Sections 9-12.

MOVING TEXT FROM ONE DOCUMENT TO ANOTHER

Edit the first document, mark the desired text (put cursor at beginning of the text, type ^KB, put cursor at end, type ^KK), and execute a block write (^KW). Terminate editing of this document (abandoning with ^KQ is fastest if you have made no changes or deletions), open the second document, put the cursor where you want the text, and do a ^KR, specifying the file name used in the preceding ^KW.

ALTERNATE METHOD OF MOVING TEXT WITHIN A DOCUMENT

The block move and block copy commands were described earlier in this section; an alternate method of moving or copying text is to write the desired text onto an additional file (^KW command), move the cursor to the destination, and read the file (^KR command). This method is for moving text a great distance within a very long document, as it is faster and requires less temporary disk storage.

DELETING FILES

To conserve disk space, delete any file you make temporary use of (as to hold text being moved between documents) as soon as you are done with it and have checked the results. This can be done with the ^KJ command.

If you do get a DISK FULL error (Appendix B), the ^KJ command may be used to delete any unnecessary files.

CHOICE OF FILE NAMES

When using the ^KW command, be sure not to choose an existing file name containing information you want to keep. To reduce the chance of overwriting existing text, some users like to use distinct file types. For example, DOC for documents, LIB for boiler plate files, and TMP for temporary files used only for moving text around within documents.

HELP COMMANDS

The following commands control the "help level" and display learning aids and reference information on the screen.

The "help level" (0 to 3) determines the degree of prompting and menu display used by WordStar. The various help levels were described in Sections 1 and 2 and are summarized on the screen when a "set help level" command (^JH) is entered.

Table 6-3. Help Commands

<u>Command</u>	<u>Description</u>
^JH	Set Help Level. Displays current "help level" and asks for new, as detailed in Section 1.
^JB	Paragraph Re-Form. Explains use of the ^B command.
^JF	Flags. Explains the meaning of flags in the rightmost column.
^JD	Dot Commands. Explains the ordinary dot commands (P command).
^JI	Command Index. Tells which menu to go to for common word processing commands. Explains how to enter text.
^JS	Status Line. Explains items on the status line.
^JR	Ruler Line. Explains the ruler line.
^JM	Margins and Tabs. Explains how to set margins and tabs.
^JP	Place Markers. Shows how to use place markers.
^JV	Moving Text. Shows how to move a block of text.
^P	Print Control Characters. Explains use of print control characters.
^O	Shows whether options such as word wrap and justification are on or off.

The ^J commands display information on the indicated subjects; many of these commands display more than one screenful, awaiting a keystroke between screens. To return to editing without proceeding through all the screens, type ^U.

The command prefix menus also show useful information in addition to commands that may be entered. The menus are described in Section 2.

MISCELLANEOUS COMMANDS

Table 6-4 describes commands not covered yet, and mentions a number of others for reference.

Table 6-4. Miscellaneous Commands

<u>Command</u>	<u>Description</u>
^QQ	Repeat. The next command entered is repeatedly executed at a user-controllable rate. The screen is updated after each execution. While ^QQ is in effect, the digits 1-9 may be typed to vary the speed. 1 is fastest, 9 is slowest. The default speed is 3. Any other key terminates the repetition. For example, ^QQ^C displays successive screenfuls of text until stopped.
^U	Interrupt. Stops command(s) in progress. The slower commands interrupt in the middle of execution, leaving the cursor in an unspecified place.

Table 6-4. Miscellaneous Commands (Continued)

Command	Description
^Px	Enter Control Character. Enters any next character x, except space, into the document, even if it is a control character normally interpreted as a command; if the next keystroke is a letter, the corresponding control character is entered. See Section 3.
^KL	Change Logged Disk Drive. Displays name of current logged disk drive, and asks for new logged disk drive. (To leave logged disk unchanged, press RETURN). Same function as no-file menu L command (Section 1).
^KF	File Directory ON/OFF. Enables/Disables ongoing display, during editing, of the file directory (names of all files) of the logged disk drive.
^KP	Print a File. The ^KP command first initiates printing. After printing has begun, a second ^KP stops printing ; after a printing job has been stopped, a third ^KP continues printing again. See Section 8 for details.

The Interrupt Command (^U)

If you have typed several commands, the interrupt command (^U) will clear those whose execution has not yet started. Also, ^U may be entered in response to questions such as FILE NAME? or FIND? to abort the command asking the question. Unless nothing is interrupted, ^U displays

*** INTERRUPTED ***

and requires the operator to press the ESCAPE key.

Changing the Logged Disk Drive (^KL)

Changing the logged disk drive does not effect which disk is used by edits and prints already initiated. It does change the default disk for all file names subsequently entered, as well as the disk whose directory is displayed.

The File Directory Toggle (^KF)

WordStar will usually display part of the directory only; ^Z and ^W may be used to scroll the directory display in order to view all file names.

Note that ^KF causes the directory to become part of the screen display until another ^KF is given. In contrast, ^F typed while entering a file name will invoke a temporary directory display.

LONG DOCUMENTS

While WordStar can edit as large a file as can be held on a disk, the WordStar edit function works most quickly, easily, and flexibly on files of moderate size. For best results, break up large documents into multiple files whenever practical. However, there are several reasons why you may not wish to divide your document into multiple files:

- o A page break is mandatory between files.
- o Automatic page-numbering works only within a file (though you can specify the starting page number of each file with a dot command).
- o Multiple print commands must be given to print multiple files.

Determining File Size

The size of a file in bytes (characters) can be determined with the operating system file status command by entering the R command from the no-file menu. You may also check file size, while editing, as follows: move the cursor to the end of the file (^QC command) and enter ^OP to turn off page display. When page display is off, the number of bytes (characters) in the file displays in the status line, in the form FC=cccc.

How Large Is Large?

This varies over a wide range depending on the amount of RAM in your system. When a file can be held entirely in RAM, as indicated by the fact that the cursor will move from the end of the file to the beginning (^QR command) in a couple of seconds, the file is still small. When this operation starts taking minutes instead of seconds, the file is large. At this point you should either read the rest of this section carefully, or divide the file in two (see the block write command, ^KW, described earlier in this section, "Additional File Commands").

Space for Large Files

When editing a file, WordStar always uses disk space to make the new copy, and also uses additional space for a temporary file whenever the cursor is moved **backwards** in the file from a point at which a change was made over more characters than can be held in RAM.

The first limit you will reach is having insufficient disk space for the **temporary file** used during cursor backup. When this limit is reached, a DISK FULL error (Appendix B) may occur on backwards cursor motion, but it will still be possible to move the cursor forward and to save. The impact of this limitation can be minimized by moving only forward when editing (below).

The second limit is that reached when there is insufficient disk space for the **new copy of the file**. Don't let this occur! Watch your file size and disk space available (with the operating system file status command), and move files to separate disks as necessary to assure plenty of working space.

Eventually a file may get so large that it is not possible to fit two copies on a disk. In this case, the file must be edited to a different disk each time. As noted in Section 1, this is done by entering a space and a second disk drive name **after** the file name. You can do this with D or N in WordStar or in the system command that calls up WordStar. When you do this, each "save" will alternate between disks. Divide such large files into smaller files whenever you can. The absolute limit on file size is the capacity of a disk.

Editing Technique for Large Files

Avoid moving the cursor a great distance backwards when you are editing a large file for two reasons:

- o To minimize temporary work file disk space requirements and thereby avoiding DISK FULL errors;
- o Moving the cursor a long way backwards is very slow.

To avoid moving the cursor a long way backwards, organize your changes to proceed forward through the file making all changes in approximate sequential order. To get back to the beginning from a place near the end, save (^KS) instead of using ^QR. Not only is saving faster for large files; saving also protects you against disasters by saving all changes made so far.

Similarly, if you want to do a global replace, save first to get to the beginning of the file. Also avoid using the block move and block copy commands if the source and destination locations are distant from each other. Instead, use block write (^KW) to a file, move the cursor (saving if cursor destination is before source), then use additional file read (^KR).

MORE ABOUT CHANGING DISKS

This section repeats the rules given in the **General Information Manual** about changing disks, and adds some exceptional conditions for changing disks safely.

1. You may safely change the disk in a drive at the system prompt. Some systems may require you to type ^C (control-C) immediately after the change.
2. You may change disks when WordStar is at the no-file menu (not editing) and not printing to a disk file.
3. If there has been no disk in a drive since it was last safe to change disks, you may insert one in that drive.
4. You may change the disk in a drive if it is only to be read, as with the file read command ^KR (earlier in this section) or print (Section 8) commands. But be sure you issue no command that could write on the newly inserted disk.

DOCUMENT FILES AND FILE COMPATIBILITY

A WordStar document file (one edited with the D command, or in which word wrap or ^B was used) may be incompatible with some other programs or languages. This has no impact on word-processing applications in which all editing and printing is done with WordStar, but if you wish to use WordStar as a general purpose editor—to prepare input for other text formatters, to enter data for application programs, or to edit program source files—read on.

The difference between a WordStar document file and a standard ASCII file is that in the WordStar document file, the high order bit of a byte is set in certain cases, whereas in the standard ASCII file, this bit is always clear. Many programs and languages ignore this bit; in others, it causes errors.

To generate a file that is sure to be compatible with other programs, invoke edits with the "edit a non-document" (N) command (further described in the next section), and don't use word wrap or the "reform paragraph" (^B) command. Enter all carriage returns and format all lines as desired manually.

Alternately, in some systems you may use WordStar in any manner, then mask off high order bits by editing the file with the operating system's editor or with MicroPro's WordMaster. This will of course have the effects noted in the next paragraph; you may want to keep an unmasked copy for later re-edit with WordStar.

WordStar document files should not be edited with other editors if you expect to use the file later with WordStar. Doing so may change all soft spaces and soft carriage returns into hard spaces and hard carriage returns, which will frustrate any later attempts at reforming existing text with WordStar. Also, if a file is thus edited, then printed with WordStar on a daisy-wheel printer, micro-justification may not occur.

NON-DOCUMENT FILES

The word-processing user need not be concerned with this subsection.

Editing a Non-Document

The "Open a Non-Document" command (N on the no-file menu) has a dual purpose: (1) to disable dynamic pagination for file compatibility, (2) to supply a different set of defaults for convenience.

We have occasionally noted differences between a regular file edit, initiated with the D command from the no-file menu or with a system command of the form "WS filename", and a "Non-document" edit initiated with the N command. Here is a complete list:

1. Dynamic pagination, which makes use of the high order bit, is suppressed. Page break display (^OP) cannot be turned on.
2. Status line shows file character and file line instead of page and line on page (Section 2).

3. Dot commands are not checked during editing:
 - a. No "?" flag for invalid dot command.
 - b. The message PUT AT FILE BEGINNING FOR CORRECT PAGE BREAK DISPLAY does not appear.
4. Word wrap, justification, variable tabbing, and ruler display default OFF rather than ON. These features may be turned on with the usual commands (Section 4) if desired.

Note that use of word wrap or paragraph reform (^B) can put "high order bit" flags in the file, causing possible incompatibility with some external programs.

Fixed Tabbing Mode

For normal word processing uses, leave variable tabbing mode on. If you have occasion to work with existing files containing tab characters, or wish to use fixed tabs (for example, in computer program preparation), read this section.

When variable tabbing is off, "tab" characters (^I, 09 hex) are used in the file, displayed with fixed stops every 8 columns, as opposed to the multiple spaces entered into the file by variable tabbing mode. This type of tabbing is compatible with that used by most operating system editors and by MicroPro's WordMaster; such tabs are customarily used in program development.

Since each "tab" is a single character, fixed tabs edit differently from variable tabs:

- o The cursor cannot be placed within the white space on the screen representing the tab, but "pops" across it
- o A tab deletes as a single character
- o A single character will overwrite a tab

When inserting before a tab, the text after the tab remains in the same screen position until sufficient text is inserted to push the tab to the next stop, at which point it "pops" right to the next multiple of 8 columns.

The tabbing mode relates to the **entry** of tabs (insertion (^V) on, or the line must be extended to reach the next tab stop). Tab characters already in the file will display the same (looking like spaces) and edit in the normal fixed-tab manner (not at all like spaces--previous paragraph) when variable tab mode is on. When variable tab mode is on and the tab key is used to move the cursor over existing text (insertion off), and the text contains tab characters, the cursor may come to rest beyond the next tab stop column since it can't stop in the middle of a tab character.

There is no need to set fixed tabbing to edit a file already containing fixed tabs unless you need to use the ^I (tab) key and have it enter fixed tab characters into the file.

Section 7 Printing Features: Part 1

Two types of print directives, print controls and dot commands, were introduced in the **General Information Manual**. This section provides specific details on print controls and some dot commands. Section 8 continues with details on the rest of the dot commands and procedures for printing a document.

PRINT CONTROL CHARACTERS

The print controls are single control characters entered into the file during editing to produce such special effects as underline, boldface, and subscripts during printing.

Print controls are entered by typing ^P followed by the desired letter. The letter may be typed in upper or lower case, or with the CTRL key pressed. Features such as underlining and boldface, produced by print controls, may be used freely in mid-paragraph (or even within a word); the control characters fall through the word wrap and paragraph re-form operations with no special consideration.

Formed lines containing print controls will appear to be too long on the screen, but will be printed the correct length on paper. This is because WordStar puts extra characters in the line to compensate for the fact that the print controls use no columns during printing.

The print controls are shown in Tables 7-1 and 7-2, followed by detailed discussions of certain topics. (When two characters are given under "Character," the command must be entered at the beginning and end of the affected text.) The Print Menu gives a quick summary of these print controls.

Table 7-1. Print Control Toggles

<u>Character</u>	<u>Function</u>
^S ^S	<p>Underscore Toggle. Enter before and after phrase to be underlined. Only non-blank characters are underlined; spaces and tabs between the two toggles are not underlined. Example:</p> <p style="padding-left: 40px;">Screen: Just ^Sone^S word. Paper: Just <u>one</u> word.</p>
^B ^B	<p>Boldface Toggle. Offsets slightly and overstrikes on Daisy Wheel and other printers capable of incremental motion; multi-strikes each character on "Teletype-like" (i.e., regular) printers.</p> <p style="padding-left: 40px;">Screen: Just ^Bone^B word. Paper: Just one word.</p>
^D ^D	<p>Double-strike Toggle. Strikes each character twice with no offset. Produces a lighter boldface than ^B; may also be used with carbon ribbon to produce extremely sharp impression of entire document.</p> <p style="padding-left: 40px;">Screen: Just ^Done^D word. Paper: Just one word.</p>

Table 7-1. Print Control Toggles (Continued)

<u>Character</u>	<u>Function</u>
^X	^X Strikeout Toggle. Prints -'s over characters; may be used to indicate deleted text in a revised version of a document. Screen: Just <code>^Xone^X</code> word. Paper: Just one word.
^V	^V Subscript Toggle. Enclosed characters printed as a subscript, (i.e., printed a fractional line below the rest of the text). Screen: <code>H^V2^VO</code> Paper: <code>H₂O</code>
^T	^T Superscript Toggle. Enclosed text is printed fractional line above rest of text. Screen: <code>(ab)^T2^T</code> Paper: <code>(ab)²</code>
^Y	^Y Ribbon Color Toggle. For daisy wheel printers and other printers with ribbon color selection, causes enclosed text to be printed in alternate color, usually red. Screen: Just <code>^Yone^Y</code> word. Paper: Just one word. [red]

Subscript Toggle (^V)

The amount of roll-down defaults to 3/48ths of an inch and may be altered with the subscript roll (.SR) command (Section 8). On printers without fractional line roll, a subscript is printed in the next line if it is blank (e.g., if double spacing); otherwise, it is printed in the same line.

Ribbon Color Toggle (^Y)

Of course, a two-color ribbon must be installed in the printer for ^Y to be effective. Special installation is required to activate this character on non-daisy printers (see the **Installation Manual**).

Table 7-2. Other Print Controls

<u>Character</u>	<u>Function</u>
^C	Stop Print. Stops printing until restarted by operator. May be used to permit typewheel or ribbon change, so that multiple type-faces or printing of different colors may be intermixed within document. Screen: Stop here.^C Paper: Stop here. [printer stops]
^A	Select Alternate Character Pitch. For daisy wheel printers, this goes to 12 characters per inch (elite), or as modified by the character width (.CW) dot command (Section 8). Normally ^A has no effect on non-daisy printers.

Table 7-2. Other Print Controls (Continued)

<u>Character</u>	<u>Function</u>
^N	Return to Standard Character Pitch. For daisy wheel printers, selects 10 characters per inch (pica), or as altered with .CW command (Section 8). Normally has no effect when printing on a non-daisy printer.
^K	Left-Right Heading/Footing Control. This character is used in heading and footing dot commands to produce headings, page numbers, etc. which print on the left side of even-numbered pages and on the right side of odd-numbered pages.
^F	"Phantom Space." On a daisy wheel, print the character for code 20 hex. This code, normally a space for non-daisy printers, prints a "cent sign" or other special character on many 88- and 96-character daisy wheels--the exact graphic depends on the print wheel in use.
^G	"Phantom Rubout." On a daisy wheel, print the character for code 7F hex. This code prints a NOT sign, double underline, or other graphic on many 96-character daisy print wheels.
^O	Non-Break Space. Prints as a space, but not treated as a space for line break or justification purposes during line forming. Screen: FORTRAN^OIV Paper: FORTRAN IV
^H	Strikeover. Causes the next character to overprint the preceding character on the line. Screen: a^H` la mode Paper: à la mode
^Q	User Printer Functions. These control characters are intended for accessing special printer functions that WordStar does not otherwise support, such as changing type fonts or activating a sheet feeder.
^W	
^E	
^R	

Stop Print (^C)

A stop print may be used in mid-line, or several times in the same line if desired. When the pause occurs, PRINT PAUSED will appear in the status line; the P command (no-file menu) or the ^KP command (while editing a file) may be used by the operator to restart the printer. Note that printers which normally print bidirectionally under WordStar will always print a line containing a ^C left to right.

Return to Standard Character Pitch (^N)

When installing WordStar for a "Teletype-like" (non-Daisy) printer, the user may set up ^A and ^N to select between two character widths if the printer is capable of changing character widths upon being sent a control sequence of four or fewer characters. See the **Installation Manual**.

Left-Right Heading/Footing Control (^K)

When used on the same line as a heading or footing (.HE or .FO) dot command, the effect of ^K is to suppress printing of following spaces up to the next non-space if the page number is even. Outside of .HE and .FO commands, ^K is ignored. See discussion of left-right page numbers in Section 8.

Non-Break Space (^O)

Use ^O where you want a single space to appear without allowing expansion during justification or wrap to the next line.

Strikeover (^H)

Strikeovers are useful for putting accent marks over letters and for creating special symbols by overprinting multiple characters. May be used in "formed" text — word wrap and paragraph reform make proper allowances for backspaces. Registration is not exactly precise in justified text. On a non-backspacing (Teletype-like) printer, do not backspace through the same column more than 8 times.

User Printer Functions

(^Q, ^W, ^E, ^R)

When installing WordStar, each of these four controls may be set up to send any desired sequence of one to four characters. Any line containing a user printer function control is always printed forward even if bidirectional print is in use.

Until a definition is installed, the four functions do nothing. Check Appendix C of the **Installation Manual** to see if the standard WordStar installation for your printer activates any of these characters. For information on installing your own definitions, see the **Installation Manual**.

Other Control Characters

Control characters not defined in Table 7-1 or Table 7-2 will print as a ^ and a letter, just as they display, with the exception of the characters shown in Table 7-3.

Table 7-3. Non-Printing Control Characters

<u>Character</u>	<u>Function</u>
^L	Form Feed causes a page break.
^I	The tab character enters ^I (one character) into the file which has the same effect as typing ^I in fixed tabbing mode (Section 6).
^M	Carriage Return. Entering a carriage return without a line feed (by pressing ^PM or ^P RETURN) will create an overprint line as described in Section 4.
^J	Line Feed. This character is not used in normal applications.

DOT COMMANDS

Dot commands are special non-text lines entered into the file for purposes such as setting the paper length or specifying a page heading. All dot commands have defaults suitable for normal use; you can begin using WordStar without using dot commands at all. Dot commands themselves do not print, but control the printing of actual text. Dynamic page break display also responds to certain dot commands.

The general form of dot commands was described in the **General Information Manual**. Briefly, a dot command consists of a period in column 1, a two-letter code, and, (for certain commands), a number, line of text, or other argument. Dot commands are entered into the file during editing in the same manner as other text, and display on the screen during editing. For convenience, automatic indentation to the left margin is disabled when a period is entered into or already present in column 1.

A dot command line placed anywhere in the file will be interpreted by the print function. Variables such as top and bottom margin and line height may be varied at will as far as printout is concerned. However, dynamic page break display will respond to the commands that specify line height, paper length, and top and bottom margins only when they are placed at the beginning of the file, before all text.

Tables 7-4 through 7-9, along with Tables 8-1 through 8-3, describe the regular print dot commands. These commands are summarized in Appendix A. For quick reference while editing, the ^JD command displays a brief summary of the dot commands.

The optional MailMerge command provides additional dot commands to control input of variable information from a data file or from the operator, insertion of other files into the printout, repeated printing of a file, etc. These additional dot commands are described in Sections 9-12. MailMerge also interprets all of the dot commands described here.

VERTICAL PAGE LAYOUT

The dot commands used for vertical page layout are shown in Table 7-4.

Table 7-4. Dot Commands for Vertical Page Layout

<u>Command</u>	<u>Description</u>
.LH n	Line Height. Sets line height to $n/48$ ths of an inch on daisy wheel printers. Default: $8/48" = 1/6"$ (six lines per inch). (Lines in subsequent dot commands are assumed to have the height specified by .LH—either explicitly or by default.)
.PL n	Paper Length. The number of <u>lines</u> , including top and bottom margins on an entire page. Default: 66 lines.
.MT n	Top Margin. The number of <u>lines</u> from the top of the paper to the beginning of the body of the text on the page. Default: 3 lines.

Table 7-4. Dot Commands for Vertical Page Layout (Continued)

<u>Command</u>	<u>Description</u>
.MB n	Bottom Margin. The number of <u>lines</u> at bottom of page not used for text. Default: 8 lines.
.HM n	Heading Margin. The number of blank <u>lines</u> from the page heading to the body of the text. (See also .HE command.) Default: 2 lines.
.FM n	Footing Margin. The number of <u>lines</u> between the end of the text and the page number or footing (see .FO). Default: 2 lines.

Discussion of Vertical Page Layout

The maximum number of lines on the page used for the body of the text is the paper length, minus the top and bottom margins. If the line height (.LH, above) is changed after these commands are given, the same number of inches, not lines, of text continues to be printed. Fewer lines are of course used for particular pages where .PA or .CP commands (below) cause page breaks. The top and bottom margin values may be adjusted to give the desired number of text lines on a page, and to center the text vertically on the page for your positioning of the paper in the printer.

During editing, the commands for line height, paper length, and top and bottom margin (.LH, .PL, .MT, and .MB) will be interpreted correctly by the page break display only if they appear at the beginning of the file. However, as far as printing is concerned, they may be used anywhere in the file to vary the vertical page format.

Note that the settings used for vertical page layout must be used in conjunction with the adjustment of page perforations in your printer. This adjustment can make a difference of two or three lines in how far up or down on the page the body of text appears (see Figure 7-1).

Line Height (.LH n)

As noted in Table 7-4, if no line height is explicitly specified in a file, the default is n=8, meaning a line height of 8/48" (1/6"), or 6 lines per inch. Table 7-5 shows how other specifications translate into lines per inch.

Table 7-5. Line Heights

<u>Dot</u> <u>Command</u>	<u>Lines</u> <u>per Inch</u>	<u>Dot</u> <u>Command</u>	<u>Lines</u> <u>per Inch</u>	<u>Dot</u> <u>Command</u>	<u>Lines</u> <u>per Inch</u>
.LH 1	48.0	.LH 6	8.0	.LH 12	4.0
.LH 2	24.0	.LH 7	6.8	.LH 16	3.0
.LH 3	16.0	.LH 8	6.0	.LH 18	2.6
.LH 4	12.0	.LH 9	5.3	.LH 20	2.4
.LH 5	9.6	.LH 10	4.8	.LH 24	2.0

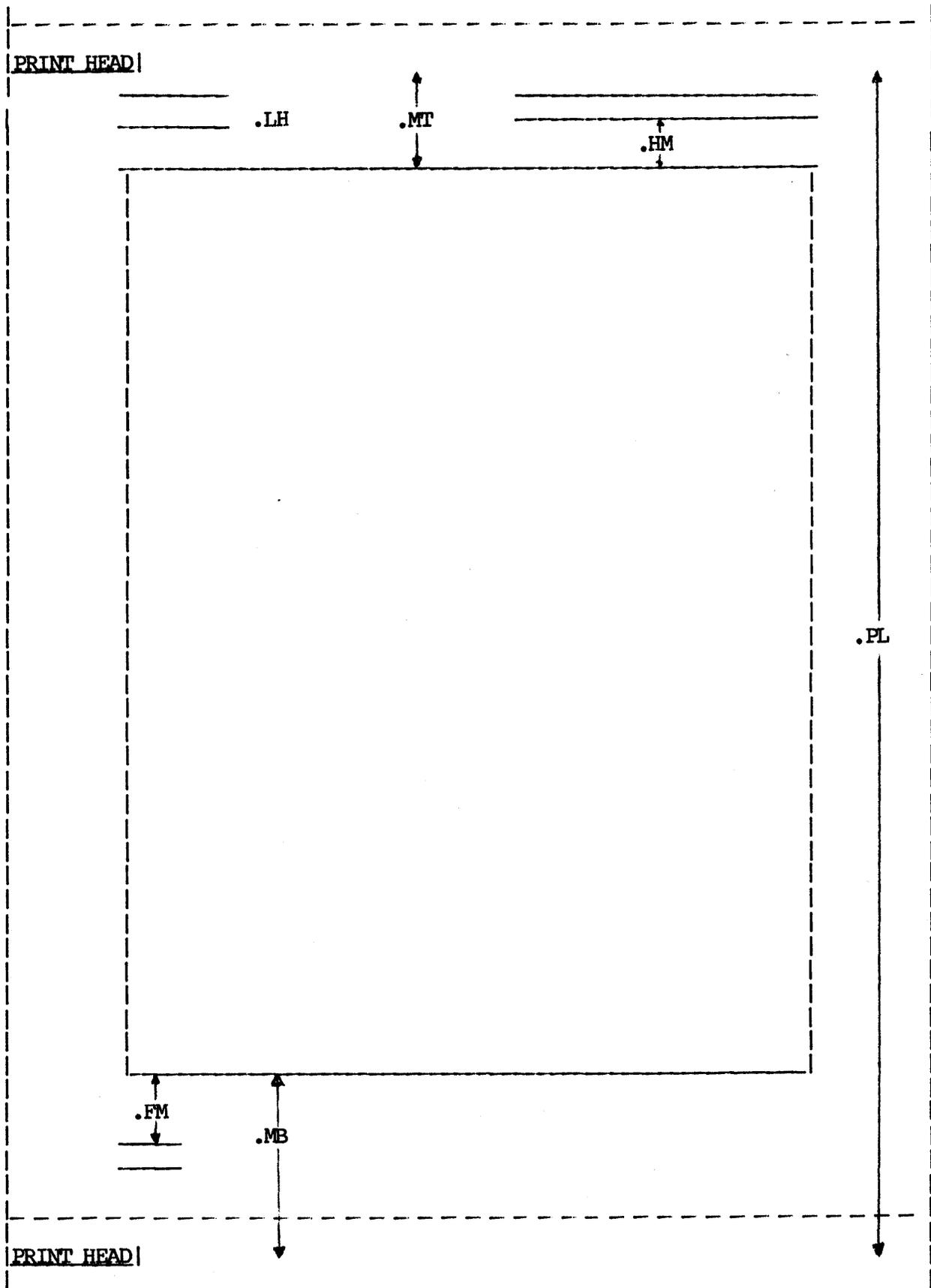


Figure 7-1. Vertical Layout of a Typical Page

The .LH command provides an alternative or supplement to the single, double, triple spacing that can be applied via the ^OS command (Section 4) to text as lines are formed. If .LH is used when printing on a printer incapable of incremental spacing, page breaks are nevertheless determined as though the command took effect.

Note that all subsequent commands taking a number of lines as an argument will be interpreted in terms of the new line height. Previously set values (top margin, paper length, etc.) will remain the same in inches.

CHANGING LINE HEIGHT ON A DAISY WHEEL PRINTER

On Daisy wheel printers, the line height may be specified in 48ths of an inch with the .LH command. For example, to print 8 lines per inch instead of the usual 6, use the command:

```
.LH 6
```

When the line height is changed on a daisy wheel printer, **previously specified** margins and paper length are not effected. They remain the same in inches, regardless of the line size. However, subsequent .PL, .MT, .MB, .HM, and .FM commands are interpreted (converted to inches) in terms of the new line height.

Thus, if you use the .LH command, carefully consider the order in which .LH and other vertical format commands are given. For example, .LH 6 followed by .MT 4 yields a 1/2 inch top margin (4 lines of 6/48 each), whereas .MT 4 followed by .LH 6 yields a top margin of 2/3 inch, because the .MT command, appearing first, is interpreted using the default line height of 8/48 of an inch.

The print function will handle as many changes of line height as you wish, but for dynamic page break display to work, you must set the line height only at the beginning of the file.

Hint: To achieve varying line heights without interfering with dynamic pagination, set the line height to 4 (one-half of normal) at the beginning of the file, then use double-spaced text for close-spaced printout, and triple or quadruple spaced text for wider line spacing. The ^OS command, (Section 4), can be used to cause automatic double, triple, etc. spacing as text is entered or reformed.

CHANGING LINE HEIGHT ON A NON-DAISY PRINTER

The line spacing on a non-daisy printer is unaffected, but the page breaks and page length are determined as **though on a daisy wheel printer**. Thus, drafts of text to be final-printed on a daisy wheel may be printed on a line printer with page breaks occurring as they will in the final, but with the amount of text being printed on a page frequently too little or too much for the forms in use. Use the USE FORM FEEDS option (described in Section 8).

If you have a document containing `.LH` commands and you wish to print it neatly on a non-daisy printer, remove the `.LH` commands. Since `..` indicates a comment, you can change them to `.LH` with the Replace command. Then they can easily be changed back to `.LH` later.

Paper Length (.PL n)

The paper length must match the forms in use (except that smaller values will also work if the `USE FORM FEEDS` option is selected when printing). The default is 66 default-height lines, or 11 inches.

WordStar assumes 66 lines to the page, corresponding to 11-inch (letter size) paper at 6 lines per inch. If you wish to use a different size of form (such as legal size), specify the number of lines on each **complete piece of paper** with the `.PL` command. This is not the number of lines of text printed, but the form length. The paper length may be set shorter than the actual form length only if your printer has hardware form feed capability and the `USE FORM FEEDS` option is elected every time print is initiated (see Section 8).

A `.PL` command should also be used as appropriate if your non-daisy printer prints lines spaced other than 6 to the inch. For example, if your printer prints 8 lines to the inch and you want to use 11 inch paper, put `.PL 88` at the beginning of your file.

Top Margin (.MT n)

Note that the page heading, if in use, and the heading margin, are printed in this space. See also the commands for heading margin and heading text (`.HM` and `.HE`). Default: 3 lines. The "top of the page" for the first page printed is wherever you position the paper before starting print if the `USE FORM FEEDS` option is not specified when print is initiated (see Section 8).

Bottom Margin (.MB n)

The page number or footing, if in use, is printed within the bottom margin. See the command for footing margin (`.FM`) below. Default: 8 lines.

TOP AND BOTTOM MARGINS

WordStar leaves a number of blank lines set by the top margin command (`.MT`) at the top of each page (with the heading positioned in this space, if a heading is in use), and a blank area (containing the page number, or the footing if one has been specified) set by the bottom margin (`.MB`) command at the bottom of each page. The number of lines of text printed on each page, if no page break is caused by a `.PA` or `.CP` command, is equal to the paper length (`.PL`), less the top and bottom margins. To increase the amount of text on a page, decrease the top or bottom margin; to decrease the amount, increase margins.

POSITION OF TEXT ON THE PAGE

The text can be moved up or down on the page either by changing the top (`.MT`) and bottom (`.MB`) margins by the same amount, or by moving the paper in the printer, as preferred. The default top and bottom margins approximately center the text vertically on the page if the paper is positioned with the print head two or three lines down from the top of the page when printing is initiated.

If you are loading single sheets, such as letterheads, you may want to move the text up (smaller top margin) so that you can roll each sheet under the bail.

Information on moving the text on the page horizontally is given in the next subsection ("Horizontal Page Layout").

Heading Margin (.HM n)

Note that the heading and the heading margin fall within the top margin space. If a value greater than top margin less 1 is specified, top margin less 1 is used. Default: 2 lines.

Footing Margin (.FM n)

Note that the footing margin and the page number or footing appear within the bottom margin space. Default: 2 lines.

HORIZONTAL PAGE LAYOUT

Most horizontal formatting, such as the margination and justification of text, is done during editing, and does not involve dot commands. The dot commands shown in Table 7-6 are provided to control those aspects of horizontal formatting that are done by the print function.

Table 7-6. Dot Commands for Horizontal Page Layout

<u>Command</u>	<u>Description</u>
.PC n	Page Number Column. <u>Column</u> at which the page number is printed when footing is not in use and page-numbering is in effect. Default: center column. (See Table 8-1 for the commands relating to footings and page-numbering.)
.PO n	Page Offset. Number of (current width) <u>columns</u> the entire document is indented (moved right) from the printer's left margin, in addition to all indentation in the file. Default: 8 columns.

Page Number Column (.PC n)

The page number column may be set to print page numbers at left, right, or center, etc., at the bottom of the page. (Additional page number positioning options are provided through the use of # in .HE and .FO commands, as described in Tables 8-1 and 8-2.) The column width used is that of the character width in effect when the .PC command is given, as determined by ^A, ^N, or .CW commands. Default is 1/2 the edit function's default right margin, to center numbers under text of default width.

Page Offset (.PO n)

The page offset command allows offsetting the text from the tractor-feed holes at the left of the paper, and allows putting narrow paper near the center of wide printer carriages. Default: 8 columns.

The text can be moved horizontally on the page by changing the page offset. By default, WordStar prints 8 spaces (in addition to any in the file) at the beginning of each line; to move the text to the left edge of your printer carriage, put the following at the beginning of the document:

`.PO 0`

PAGINATION

The dot commands used for pagination are shown in Table 7-7.

Table 7-7. Dot Commands for Pagination

<u>Command</u>	<u>Description</u>
<code>.PA</code>	Unconditional Page. Start new page unconditionally.
<code>.CP n</code>	Conditional Page. Start new page if there are fewer than <code>n</code> lines (of the current height) left on the current page.

Page break control is used for two purposes:

- o to force the following text to begin at the top of a page, as at the beginning of a chapter;
- o to prevent going to a new page in an inappropriate place (such as in the middle of a table or after a section title but before the beginning of the text after the title). Many users also wish to prevent page breaks one or two lines into a paragraph, preferring that the entire paragraph be on the next page.

Unconditional Page (`.PA`)

For the first case, where a new page is always desired, use the unconditional page command:

`.PA`

Conditional Page (`.CP n`)

For the second case, it is usually desired to have a page break occur only when less than a certain number of lines remain on the current page. For these cases, use the conditional page (`.CP`) command. This command tests the number of lines remaining on the current page, and causes a page break only if too few remain. For example, if you have a table 10 lines long, put

`.CP 10`

above it. This will cause a page break during printout (and also display the page break line on the screen unless the page break display is OFF) only if less than 10 lines remain on the current page. That is, the following 10 lines, containing your table, will print on the current page if they will fit, otherwise a new page will be begun, with your table at the top.

Using .CP instead of .PA reduces the need to check pagination and move dot commands as the document is updated. For example, if a page break fell in the middle of the table of the previous example and you corrected this by inserting a .PA above it, you would need to find and remove the .PA later if you made an insertion above the table as .PA always causes a page break even if it falls at the top of a page. On the other hand, a .CP 10 that falls more than 10 lines above the bottom of a page has no effect and may be left in the document, to become active whenever revisions preceding it make it fall near the bottom of the page.

As another example, we suggest always putting .CP 5 (or so) above each section title. This forces a new page if less than 5 (or whatever number you specify) lines remain on the page, so that a section title will not appear as the last line on a page or with only two or three lines of text after it. If you enter these as a matter of habit when initially entering documents, then as the document is revised it will always print well-paginated even if you do not review the pagination after each edit.

One more example: look at this manual. It rarely pages in mid-paragraph. This was accomplished via generous use of .CP commands.

Use .CP to keep blocks of text together, to prevent paging just after a title, in the middle of a table, etc. Using lots of .CP commands can make the document always print well paginated regardless of insertions or deletions as these commands have no effect when not needed.

Section 8 Printing Features: Part 2

HEADINGS, FOOTINGS, AND PAGE NUMBERS

The dot commands for headings, footings, and page numbers are shown in Table 8-1.

**Table 8-1. Dot Commands for
Headings, Footings, and Page Numbers**

<u>Command</u>	<u>Description</u>
.HE text	Heading. All text on the rest of the line beginning with .HE is used as a page heading for FOLLOWING pages until another HE is given. Default: no heading. (See Table 8-2.)
.FO text	Footing. The rest of the line beginning with .FO is used as a page footing for the current and following pages. Default: page number. (See Table 8-2.)
.OP	Omit Page Numbers. This command suppresses the printing of page numbers in the footing line if no footing has been given.
.PN	Page Number. .PN without a number turns page numbering back on after a .OP command without setting page number.
.PN n	Page Number. .PN with a number turns page numbering on (if it has been turned off with .OP) and sets the page number.

The special characters shown in Table 8-2 are interpreted in headings (.HE) and footings (.FO) only.

**Table 8-2. Special Characters
Used in Headings and Footings**

<u>Character</u>	<u>Description</u>
#	Prints as current page number. May be used to position page number wherever desired at top or bottom of page.
\	Print next character literally; do not interpret it as a control symbol— use \# to print # in a heading or footing, \\ to print \.
^K	If the page number is even , ignore spaces up to the next character ^K may be used to cause page number or other heading or footing text to appear on the corner of the page away from the binding.

Note that a control-K is entered into the file by typing control-PK, as with all print controls ("Print Control Characters" in the preceding section).

Heading (.HE text)

Use the .HE command to specify the text of a one-line heading to be printed at the top of each page. Examples:

.HE Part II

.HE Section 3

Basic Editing

When composing a .HE command on the screen, bear in mind that the ".HE " takes four columns that don't print, so it will display four characters to the right of where it will print. Spaces in addition to one after ".HE" are printed, so a right-adjusted heading may be produced, for example, as follows:

.HE

Section 5

The heading may be changed as often as desired. The initial (default) heading is blank; the heading may be changed back to blank with .HE with no text. To print a heading on the first page, a .HE command must precede all text in the file.

Underline, boldface, and other enhancements invoked by print control characters may be used freely in headings (and footings) without affecting the body of the text; conversely, enhancements in use in the body of the text do not affect headings and footings.

PAGE NUMBER IN THE HEADING

If you wish the page number to be printed at the top of the page, give a .HE command with a "#" in the position where you wish the page number printed. For example, if you want the word "page" followed by the page number at the top left of each page, use the following dot command:

.HE page #

When composing a heading containing a #, bear in mind that the number of columns occupied by the page number will depend on the number of digits in the page number. When printing the page number at the top of the page but not using a footing (no .FO command), it is necessary to give a .OP command to prevent WordStar from printing the page number again at the bottom of the page.

CHANGING THE HEADING

The heading may be changed as often as desired; to revert to no heading, give a blank heading:

.HE

Each .HE takes effect at the next page top encountered; if it occurs before any text has been printed on the current page (for example, immediately after a .PA command), it will be used on the current page.

The number of lines between the heading and text can be changed with the `HM` (heading margin) command. This command moves the heading, without altering the page length or the position of the text on the page; the heading margin falls within the top margin. No heading will be printed if the top margin (`.MT`) is set to zero.

SPECIAL EFFECTS IN THE HEADING

Underline, Boldface, and other enhancements invoked by print control characters may be used freely in headings (and footings). Print controls in `HE` (and `.FO`) commands do not affect the body of the text, nor do those in the body of the text effect the heading (or footing). If you vary the character width (as discussed below), the heading (or footing) will be printed in the character width that was in effect when the `HE` (`.FO`) command was given. However, if `^A` or `^N` is used within the heading (or footing), the pitch in effect at each time the heading is printed will be used.

Footing (`.FO` text)

The `.FO` command may be used to specify a line of text to be printed at the bottom of each page. Use of this command is similar to use of the `HE` command (preceding). The most recently specified footing is used when the bottom of each page is encountered. If the footing contains a `#`, the page number will be printed in place of the `#`.

The `.FM` (footing margin) command may be used to specify the number of blank lines between the bottom of the text area and the footing line. The footing margin lies within the bottom margin; varying the footing margin moves the footing up and down without changing the number of lines of text on the page. No footing will be printed if the bottom margin (`.MB`) is set to zero.

As many `.FO`'s as desired may be given; the footing most recently specified will be used when the bottom of each page is encountered. The characters `#`, `\`, and `^K` are interpreted in the footing text as described for the `HE` command above.

When no `.FO` command, or `.FO` with no text after it, has been given, WordStar will print the page number in the footing line at the column specified with the `.PC` command (default center unless suppressed with the `.OP` command). When a user-specified footing is in effect, page numbers are **not** automatically printed. If you wish the pages to be numbered, include a `#` at the desired position in the heading or footing.

THE DEFAULT FOOTING IS THE PAGE NUMBER

If no footing is in effect (no `.FO` command given, or most recent `.FO` command had no text after `.FO`), WordStar will print the page number in the footing line unless suppressed with a `.OP` command. The page number is centered at the column specified with the `.PC` command; the default is column 33 (or column 30 if a 64-column wide screen is used, reflecting the narrower default margins used in the edit function), so as to be centered under text formed using the default margins.

PAGE-NUMBERING

By default, WordStar numbers the pages in each file from 1 up as the file is printed. The page number may be changed as desired with the .PN command. For example, if a file represented the second chapter of a large document, and there were 23 pages in the first chapter, you might want to put

.PN 24

at the beginning of the chapter 2 file, so that its pages would be numbered from 24 up as it was printed. Note that .PN effects the page numbering at printout only; the page numbers displayed in the status line during editing always start with 1 and increase by 1 each page.

The maximum page number WordStar will accept is 65533. (For the other dot commands, the maximum argument is 255.)

The page number may be positioned wherever desired in the heading or footing line by using a # in the .HE or .FO command, as discussed above. If no footing is specified, the page number is printed by default in the footing line. This default page number printout may be disabled with .OP, and re-enabled with .PN (no number need be given after .PN unless it is also desired to set the page number). The column at which the page number prints in the default footing may be changed with .PC n. For example, if you wanted to center the page number under text 80 columns wide (as formatted during editing) you could use

.PC 40

The following footing command would have the same effect:

.FO #

ALTERNATING PAGE NUMBERS

By using the special character ^K in a .HE or .FO command, you can make WordStar print page numbers (or other heading and/or footing texts) at the right hand side of odd numbered pages but at the left hand side of even numbered pages, so as to be on the side of the page farthest from the binding. To enter ^K into the text, you must press ^PK. The effect of ^K is to suppress printing of following spaces (up to the next non-space character) if the page number is even. For example, the following footing is used in this section of this manual:

.FO ^K 8-#

The above footing prints on even-numbered pages as

8-#

putting "8-" and the page number on the lower left corner of the page. On odd numbered pages, it prints as

8-#

Omit Page Numbers (.OP)

If a footing has been specified, .OP has no effect; .OP also does not affect printing of page numbers where a # appears in the heading or footing. Page numbering defaults on.

Page Number (.PN or .PN n)

A page number command **without** a page number (.PN) has no effect if the footing line has been preempted with a .FO command.

A page number command **with** a page number (.PN p) sets the page number to appear at the bottom of the current page and/or at a # encountered as the page heading or footing is printed. The default starting page number is 1; the page number increases by 1 each page whether or not printed. .PN effects the printout page number only; those displayed at the top of the screen during editing always run up from 1.

OTHER FEATURES

Dot commands for other printing features are shown in Table 8-3.

Table 8-3. Dot Commands for Other Features

<u>Command</u>	<u>Description</u>
.CW n	Character Width. On daisy wheel printers, sets character width to $w/120$ ths of an inch, for either the standard or alternate character pitch, whichever is in effect. Default: $12/120" = 1/10"$ (10 characters per inch).
.SR n	Sub/Super-Script Roll. On daisy wheel printers, rolls the carriage $n/48$ ths of an inch before printing a subscript or superscript. Default: $3/48"$.
.UJ ON .UJ OFF	Microjustification ON/OFF. When Microjustification is OFF, all spaces, including soft spaces, are printed exactly as they appear in the file. Spaces added to justify lines on the screen print as they appear on the screen, rather than being evenly distributed between words in $1/120$ ths of an inch on daisy printers. Default: ON.
.BP ON .BP OFF	Bidirectional Print ON/OFF. Bidirectional print (printing alternate lines right to left) is normally ON for daisy printers.
.. text	Ignore. This command specifies that the rest of the line is commentary material not to be printed.

Character Width (.CW n)

Standard and alternate pitch are selected by the ^N and ^A print controls. Has no effect on non-daisy printers. Allows unusual character spacings—for example, spacing characters farther apart than normal for emphasis in a title. The default standard pitch is 10 to the inch (equivalent to .CW 12); the

default alternate pitch is 12 to the inch (.CW 10). Table 8-4 shows the .CW command to use for various pitches (characters per inch). It also shows where to set the right margin when printing at a given pitch on standard paper (8-1/2" x 11").

Table 8-4. Character Pitch

Dot Command	Pitch (Ch/Inch)	Right Margin	Dot Command	Pitch (Ch/Inch)	Right Margin
.CW 4	30	195	.CW 12	10	65
.CW 5	24	156	.CW 15	8	52
.CW 6	20	130	.CW 17	7	46
.CW 8	15	98	.CW 20	6	39
.CW 10	12	78	.CW 24	5	32

Changing the character width or pitch (with .CW, ^A, or ^N) does not affect previously specified page offset (.PO) or page number column (.PC) values, nor previously specified heading (.HE) or footing (.FO) texts (except when ^A or ^N are used within the actual heading or footing texts). Subsequent page offset, page number column, heading, and footing commands (.PO, .PC, .HE, and .FO) will be interpreted in terms of the character width and pitch in effect when the .PO, .PC, .HE, or .FO is encountered.

CHANGING THE CHARACTER PITCH

The width of each character printed (how far the print head moves between characters) can be varied in two ways: with the ^A and ^N print control characters (earlier in this section), which may be imbedded mid-line to allow switching between two character widths, and (on a Daisy wheel printer) with the .CW command, which allows setting any character width, but only between lines. These can interact, as will be described shortly.

When a page offset (.PO), page number column (.PC), heading (.HE), or footing (.FO) is specified, it is interpreted in the current character pitch; subsequent pitch changes do not alter the page offset, page number position, or the character spacing in previously specified page headings or footings.

CHANGING PITCH ON A NON-DAISY PRINTER

To change pitch on a non-daisy printer, use the Alternate pitch (^A) and standard pitch (^N) print control characters. Their effect depends on your printer's capabilities and on what control sequences are installed in WordStar for these characters. There will be no effect if no control sequences are installed or your printer has one pitch only.

CHANGING PITCH ON A DAISY WHEEL PRINTER

To change pitch on a daisy wheel printer, use the ^A and ^N print controls or the .CW command or a combination of all three:

- ^A Selects alternate pitch, which defaults to 12 characters per inch and may be changed by giving a .CW when alternate pitch is in effect;

- ^N** Selects standard pitch, which defaults to 10 characters per inch and may be changed by giving a .CW when standard pitch is in effect;
- .CW n** Sets the character width to n/120ths of an inch for standard or alternate pitch, whichever is in effect, without affecting the other pitch. Table 8-4 gives the .CW command to use for various numbers of characters per inch.

EXAMPLES OF DAISY WHEEL PITCH CHANGES

^NThe word "**^A**crammed"**^N** is printed in alternate pitch will print with the word "crammed" in 12 pitch and the rest in 10 pitch if no preceding .CW commands have altered the pitches.

```

^A
.CW 20
^N
.CW 8
narrow^C^A w i d e ^C^Nnarrow

```

will print "narrow" in characters 8/120 inch wide (15 characters per inch), then "wide" in characters 20/120 inch wide (6 characters per inch), then "narrow" in 8/120 wide characters again. The ^C's (Section 7) cause the printer to pause so that the operator may install a different typewheel for wide characters. The carriage returns after the ^A and the ^N will cause two blank lines to be printed first.

Microjustification (.UJ ON/OFF)

Microjustification is normally on. Turning microjustification off might be useful, for example, to make a columnar table print with the columns aligned as they appear on the screen even if soft spaces were inadvertently allowed to get into the table lines by re-forming (^B) or word wrap. You may also use .uj 1 (for ON) and .uj 0 (for OFF).

Bidirectional Print (.BP ON/OFF)

Turning bidirectional print off might in some cases produce better quality output when the printer's character registration or paper feed is a little sloppy. You may also use .bp 1 (ON) and .bp 0 (OFF).

Comment (.. text)

Any undefined dot command is also treated as a comment by the print function; however, the edit function displays a ? flag in the rightmost screen column for undefined dot commands. (You may also use .ig text)

PROCEDURES FOR PRINTING

The print function prints a document or other file from a disk. Unless suppressed by an option described below, the top margin, bottom margin, page heading, and page footing are added to the text in the file, and dot commands are interpreted. The print control characters are always interpreted during

printout to control underline, boldface, pauses for typewheel changes, character pitch, etc.

Microspace Justification

If the printer in use is a daisy wheel printer (Diablo or Qume), thimble printer (NEC) or other printer capable of incremental spacing, and WordStar is properly installed to use this printer (**Installation Manual**), the printed copy will be **microspace justified**: WordStar will remove the "soft" spaces used to justify formed lines on the screen, and add space in units of 1/120th inch between words, and possibly between characters, to produce an evenly spaced line without large gaps between words. To further enhance the appearance of printed text, punctuation characters such as periods and commas are printed in a space narrower than other characters, and M's and W's are widened slightly.

Microspace justification is applied only to the area between the left and right margin of lines "formed" with word wrap or paragraph reform, so that margin alignment and position of any text outside the margins is maintained. Lines not "formed" with word wrap or paragraph reform are not microspace-justified, so that the alignment of columns in tables is precisely reproduced (the last line of a newly-entered paragraph must be "formed" with paragraph reform in order to be microspace-justified on printout).

Only a disk-stored document can be printed by WordStar; refer to the **General Information Manual** for document saving commands.

Simultaneous Editing

Since the print function can operate at the same time as the edit function, if your system has enough memory, it does not have its own menus, but is invoked, stopped, and resumed with the P command of the no-file menu, or the ^KP command while editing. When the print function is inactive, these commands will invoke initiation of printing. When printing is in progress, the same commands will stop printing. If printing is suspended ("paused"), the P or ^KP command will cause printing to resume. The menus change appropriately to indicate the current meaning of the command.

When printing is in progress, the no-file menu or the file being edited shows on the screen in the normal manner.

Editing can be initiated or continued, and most other no-file commands can be executed, while the (regular) print function is active, except on computers with minimal RAM memory. Keyboard response is somewhat slowed during printing; concurrent editing and printing are suggested for review and minor correction, but not for high-speed initial entry of text. When editing while the print function is active, watch for WAIT in the status line, or listen for clicks from your disk drive, and stop entering text until the disk activity completes. You may suspend printing (as described later in this section) temporarily when faster keyboard response is desired.

Error Handling

There are no error messages during regular print execution. Contradictory page formats, such as the heading margin greater than the top margin minus 1, force WordStar to make arbitrary decisions to allow printing to continue.

Control characters with no special definition are printed as ^ and a letter. Unrecognized dot commands are ignored (**not** printed). The additional dot commands interpreted by the optional MailMerge command (Sections 9-12) are also ignored by the regular print command. (The MailMerge command displays a message upon encountering an unrecognized dot command; MailMerge may thus be used for checking the dot commands in a document even when its other facilities are not needed.)

Printing Other Files

While the print function is intended primarily for printing documents prepared with WordStar, you may print any ASCII disk file. Form feeds work as page indicators, and tab (^I) characters expand to 8-column stops, ensuring compatibility with languages and other programs that output print files to disk. An option is available for suppressing page formatting to permit printing a direct image of an (already-paginated) file.

Printing to Disk

Print function output can be directed to disk as well as to the printer, so that a print image can be saved for later output or for examination on the screen with the edit function. In a disk output file thus produced, all dot commands present have been interpreted (unless suppression of page formatting was specified) but most print control characters remain. If no WordStar print control characters were used, the disk print output file may be printed without using WordStar.

Printer Setup

You will want to position the paper in your printer so that the text comes out in the desired vertical and horizontal position. A few trials may be needed to establish the desired paper position. The position of the text on the page can also be manipulated via the .PO, .MT, and .MB dot commands (section 7) as well as by moving the paper in the printer. The print function assumes the paper to be at the "top of form" position when printing is initiated, unless the USE FORM FEEDS option (below) is specified.

The Optional MailMerge Feature

MailMerge provides additional print-time facilities for insertion of variable information from a data file or operator entry into form letters, insertion of other document files into the printout, print-time line-forming, etc. This section describes the regular print command; the MailMerge command differs in that one additional question (NUMBER OF COPIES?) is asked during the initiation dialog, and in that editing cannot be performed at the same time as printing. MailMerge operation is detailed in Sections 9-12.

Initiating Printing

When a print command (P or M from the no-file menu, or ^KP while editing) is given with no print in progress and no print suspended, the command means "Initiate print". WordStar will ask:

NAME OF FILE TO PRINT? ■

Enter the file name. (File names are discussed in the **General Information Manual**. They are also summarized in a prompt that appears on the screen whenever you use the "open a document" command, D from the no-file menu.) The usual control characters (Section 6) may be used to correct typing errors and invoke file directory display. For details on initiating MailMerge, see Section 12.

To start printing immediately with all options defaulted; make sure the printer is ready and the paper properly positioned, and press the **ESCAPE** key after typing the file name. To cause WordStar to ask the print options questions before beginning to print, press the **RETURN** key after typing the file name. If the file is not found, a message will be displayed and the question asked again.

When the name of the file to print is terminated with the **RETURN** key, WordStar will ask the following **Print Options Questions** before starting to print:

DISK FILE OUTPUT (Y/N):
START AT PAGE NUMBER (RETURN for beginning)?
STOP AFTER PAGE NUMBER (RETURN for end)?
USE FORM FEEDS (Y/N):
SUPPRESS PAGE FORMATTING (Y/N):
PAUSE FOR PAPER CHANGE BETWEEN PAGES (Y/N):
Ready printer, press RETURN:

All of the Y/N questions are answered with a single character: Y or y or ^Y for "yes", any other character for "no"; either the **RETURN** or **ESCAPE** keys can be used to give a "no" or other default response to any of the options questions. Seven **RETURN**s thus produces the same effect as hitting the escape key after the name of the file to print. Initially, you will probably want to default most or all of the questions. The print command can be aborted by typing ^U at any of the print options questions.

Explanations of each of the print options questions follow.

DISK FILE OUTPUT (Y/N): ■

A "no" response (any single character except Y or y or ^Y) will cause the print output to go to the printer, as normally desired.

A response of Y or y or ^Y causes WordStar to ask "OUTPUT FILE NAME?". The "printed" output will then be placed on this file; this file will differ from the input in that it will be a print image, with all dot commands expanded (unless a "yes" answer is given to **SUPPRESS PAGE FORMATTING**) suitable for later copying to the printer or for examination on the screen with the edit function.

START AT PAGE NUMBER (RETURN for beginning)? ■

Type a number followed by a carriage return or escape in order to start the print at that page number. This allows restarting after printer paper jams, or printing only some latter part of a document.

A null, 0, or 1 response causes printing to begin at the beginning of the file. A non-numeric, non-null response will cause the question to be reasked until an acceptable answer is given.

STOP AFTER PAGE NUMBER (RETURN for end)? ■

Type a number and press either RETURN or ESCAPE to stop the print operation after completion of the given page number. This step provides you with a way to print only the desired pages of a document without having to manually interrupt the print operation. A null response will cause the printing to continue until the end of the file is encountered.

USE FORM FEEDS (Y/N): ■

Normally, WordStar sends the correct number of line feeds to the printer to advance to the top of the next page. Answering Y to this question causes WordStar to send a "form feed" character (0C hex) instead of multiple line feeds between pages, and also before the first page (most printers ignore form feeds when already at top of form.) Of course, the printer must be equipped to respond to form feeds, and the paper must be loaded into the printer with the top of form in the desired position.

Using form feeds is faster with some non-daisy printers, and eliminates the need for the paper length set with the .PL command to exactly match the forms and the need to vertically position the paper manually before initiating print.

SUPPRESS PAGE FORMATTING (Y/N): ■

A "Y" response to this question causes WordStar to print the dot commands in the file, rather than interpreting them. The page formatting normally done under control of the explicit or default dot commands is not done -- no top margins, bottom margins, page offsets, headings, footings, or page numbers are added to the text in the file. The output will print across the folds in the paper if not already paginated. Most print control characters in the file are interpreted regardless of the answer to this question.

Use of the SUPPRESS PAGE FORMATTING option yields a printout of the exact contents of the file, rather than a formatted document, allowing you to proofread the dot commands. This option is also appropriate for printing already-paginated files not created by WordStar, and for printing disk files created with the print function DISK FILE OUTPUT option.

PAUSE FOR PAPER CHANGE BETWEEN PAGES (Y/N): ■

To print on single sheets individually loaded into the printer, such as letterheads, give a "yes" response (Y or y or ^Y) to this question. WordStar then pauses after printing each page. When such a pause occurs, PRINT PAUSED appears in the status line. After changing the paper, type a P (no file) or ^KP (while editing a file) to continue printing.

A "no" response (any character but Y, y, or ^Y) causes WordStar to print continuously. This assumes you are printing on continuous forms.

Ready printer, press RETURN: ■

Make sure your printer is ready - turned on, set "on-line", whatever your equipment requires. Unless the USE FORM FEEDS option was specified, make sure the paper is positioned where you wish the top of the first page to print. If the paper is positioned part way down a page, each successive printed page will begin at this position.

Then press any key. Printout will begin, and control will return to the no-file menu or to the edit function.

Suspending and Aborting Printing

A print command (P if no file, ^KP while editing) given while printing is in progress will cause WordStar to stop printing, display a message showing the name of the file being printed, and ask the following question:

"Y" to ABANDON PRINT, "N" TO RESUME, ^U TO HOLD: ■

- o "Y" causes the print in progress to be aborted.
- o "N" causes printing to continue. You may resume printout after stopping to adjust the paper in the printer, etc.
- o An interrupt character (^U) causes control to return to the no-file menu or to the edit function with the print suspended ("paused") but not aborted. The next print command typed will cause print to continue. Any number of other commands may intervene before printing is continued.

To abort when print is already "paused" (next subsection), resume, then stop by typing two print commands in succession. This will get you the ABANDON question; answer Y.

Continuing Printing

Whenever printing is "paused" (suspended), printing can be resumed by entering a print command--P if no file being edited, ^KP if editing. Print can become "paused" for any of the following reasons:

1. PAUSE BETWEEN PAGES option in use and page completed (earlier in this section);
2. ^C print control character (pause until resumed by operator, as for typewheel change, Section 7) encountered in file;
3. Print stopped by operator with print command, then ^U entered at RESUME question (earlier in this section);
4. Disk full when DISK FILE OUTPUT is in use (an explanatory message is also displayed; see discussion in Appendix B).

When printing is "paused", PRINT PAUSE appears in the status line. When editing, an additional message, TYPE ^KP TO CONTINUE PRINT, is displayed above the main command menu.

Appendix A Summary of WordStar Commands

SUMMARY OF EDITING COMMANDS

Commands for Cursor Motion, Scrolling, and Searching

Commands on this page are displayed as they appear on the keyboard.

Scroll Down \hat{W} One Line	Up \hat{E} One Line	Up \hat{R} One Screen		
Left \hat{A} One Word	Left \hat{S} One Character	Right \hat{D} One Character	Right \hat{F} One Word	
Scroll Up \hat{Z} One Line	Down \hat{X} One Line	Down \hat{C} One Screen		

Scroll Down $\hat{Q}\hat{W}$ Continuously	Top of $\hat{Q}\hat{E}$ Text Area	Beginning $\hat{Q}\hat{R}$ of File		
Replace $\hat{Q}\hat{A}$ Text	Left Side $\hat{Q}\hat{S}$ of Screen	Right Side $\hat{Q}\hat{D}$ of Screen	Find $\hat{Q}\hat{F}$ Text	
Scroll Up $\hat{Q}\hat{Z}$ Continuously	Bottom of $\hat{Q}\hat{X}$ Text Area	End $\hat{Q}\hat{C}$ of File		

Cursor to
 $\hat{Q}\hat{0}-9$
 Place Marker

Cursor to Position
 $\hat{Q}\hat{P}$
 Before Last Command

Cursor to
 $\hat{Q}\hat{K}$
 End of Block

Cursor to
 $\hat{Q}\hat{V}$
 Start of
 Last Find
 or Source
 of Last Block

Cursor to
 $\hat{Q}\hat{B}$
 Beginning
 of Block

Basic Commands for Entering Text

^V	Insertion ON/OFF	^I	Tab
RETURN	End Paragraph	^O^I	Set Variable Tab
^N	Insert Hard RETURN	^O^N	Clear Variable Tab
^Px	Enter Control Character	^O^F	Set Margins and Tabs from any line in the file

Deletion Commands

DEL	Delete Character Left	^G	Delete Character Right
		^T	Delete Word Right
^Q DEL	Delete to Beginning of Line	^Q^Y	Delete to End of Line
	^Y		Delete the Entire Line
	^K^Y		Delete a Block

Commands for Saving and Abandoning

^K^S	Save File and Resume	^K^D	Save File--Done
^K^X	Save File and Exit	^K^Q	Abandon File

Onscreen Commands

	^O^C	Center a Line
^O^L	Set Left Margin	^O^R Set Right Margin
	^O^X	Release Margins
^O^G	Paragraph Tab	^O^S Set Line Spacing
	^B	Re-Form Paragraph

Formatting Toggles

^O^W	WordWrap ON/OFF	^O^H	Hyphen-Help ON/OFF
^O^T	Ruler Line ON/OFF	^O^E	Soft Hyphen ON/OFF
^O^J	Justification ON/OFF	^O^D	Print Display ON/OFF
^O^V	Variable Tabs ON/OFF	^O^P	Page Break Display ON/OFF

Place Marker Commands

^K0-9	Set/hide a Place Marker	^Q0-9	Move to a Place Marker
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Find and Replace Commands

^Q^F	Find Text	^Q^A	Find and Replace
^L	Find or Replace again	^Q^V	Restore Cursor to last Find/Replace

Parameters:

n	Find n times	B	Backward Search
U	Ignore Upper/Lower Case	G	Global Search (Replace)
W	Whole Word Search	N	Automatic Replace

Special Find Characters:

^A	Match any character	^Ox	Match any other than x
^S	Match any special character	^N	Match "RETURN, line feed"

Block Commands

^K^B	Mark Beginning of Block	^K^K	Mark End of Block
^K^V	Move a Block	^K^C	Copy a Block
^K^Y	Delete a Block	^K^H	Hide a Block
^Q^B	Move to Block Beginning	^Q^K	Move to End of Block
^Q^V	Move to Block Source		

Additional File Commands

^K^W	Write Block to File	^K^R	Read a File into Text
^K^O	Copy a File	^K^E	Rename a File
^K^J	Delete a File	^K^L	Change Logged Disk
^K^F	Directory ON/OFF	^K^P	Print a File

The Help Commands

^J^H	Display and Set the Help Level	^J^S	Status Line
^J^B	Paragraph Re-Form (CTRL B)	^J^R	Ruler Line
^J^P	Place Markers	^J^F	Explanations of Flags
^J^D	Ordinary Dot Commands	^J^V	Moving Text
^J^M	Margins and Tabs	^J^I	Command Index

Miscellaneous Commands

^QQ	Repeat a Function	^U	Interrupt
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SUMMARY OF PRINTING COMMANDS

Press **^P** before typing one of these print control keys.

Print Control Toggles

^S	Underscore	^V	Subscript	^X	Strikeout
^B	Boldface	^T	Superscript	^Y	Ribbon Color
^D	Double-Strike				

Other Print Controls

^C	Stop Print	^A	Alternate Pitch	^F	Phantom Space
^K	Right-Left	^N	Standard Pitch	^G	Phantom Rubout
^L	Form Feed	^J	Line Feed	^M	Overprint Next Line
^H	Strikeover	^O	Non-Break Space		

Ordinary Dot Commands

Table A-1. Summary of Dot Commands

Command	Function	Units	Default
.LH	Line Height	1/48 inch	8 = 6 lines to the inch
.PL	Paper Length	lines	66 default lines = 11 inches
.MT	Margin at Top	lines	3 default lines = 1/2 inch
.MB	Margin at Bottom	lines	8 default lines = 1 1/3 inch
.HM	Heading Margin	lines	2 default lines = 1/3 inch
.FM	Footing Margin (page # margin)	lines	2 default lines = 1/3 inch
.PC	Page # Column	columns	1/2 default right margin
.PO	Page Offset	columns	8 default columns = 4/5 inch
.PA	new Page		
.CP	Conditional Page	lines	
.HE	Heading		blank
.FO	Footing		page number at .PC column
.OP	Omit Page #'s		
.PN	Page Number		1
.CW	Character Width	1/120 inch	12 for standard pitch, 10 for alternate pitch
.SR	Subscript Roll	1/48 inch	3
.UJ	Microjustify	OFF(0)ON(1)	ON (1)
.BP	Bidirect. Print	OFF(0)ON(1)	ON (1)
.IG	Comment (also ..)		

Table A-2
Character Pitch

Pitch (characters per inch)	Dot Command
5	.CW 24
6	.CW 20
7	.CW 17
8	.CW 15
10	.CW 12
12	.CW 10
15	.CW 8
20	.CW 6
24	.CW 5
30	.CW 4

Default

Table A-3
Line Heights

Lines per inch	Dot Command
2.0	.LH 24
2.4	.LH 20
2.6	.LH 18
3.0	.LH 16
4.0	.LH 12
4.8	.LH 10
5.3	.LH 9
6.0	.LH 8
6.8	.LH 7
8.0	.LH 6
9.6	.LH 5

Default

SUMMARY OF MAILMERGE COMMANDS

This section briefly summarizes variables, data files, and the MailMerge dot commands. Refer to the text (Sections 9-12) for introductory explanations and additional detail.

Variables

A MailMerge variable is a symbolic name for a data item (text) which may be different in each of several letters or other documents printed by MailMerge from the same document file.

A Variable name consists of a letter followed by 0 to 39 additional letters, digits, and/or (hard) '-'s. The variable name (without &'s) is used in dot commands that establish the variable's value.

Examples: NAME
 ADDRESS1
 DATE-TODAY

A Variable reference, or place where the variable's current value is to be inserted, consists of an &, the variable's name, and another &. Spaces are allowed between the &'s and the variable name, but (hard) spaces are not allowed within the name. Soft spaces and soft carriage returns are ignored between the &'s and the variable name, and after a soft hyphen (which is also ignored) within the variable name.

Examples: &NAME&
 &ADDRESS1&
 & DATE-TODAY &
 &ADDRESS5/O&

/O in a variable reference causes that LINE to be omitted from the printout if the variable is null and the rest of the line is blank.

Variable values (the data to be inserted at references to the variable) may be 0 to 200 characters long. A variable may be given a value in three ways:

From a data file (via .DF and .RV)

Keyed in by the operator during MailMerge (via .AV)

Set within the document or an invoking document (with .SV)

A variable must be given a value before it is used. References to undefined (no value yet given) variables are printed. &'s not enclosing valid, defined variable names are printed, permitting normal use of & in text.

Data Files

A data file used with MailMerge to supply names and addresses when printing form letters or other documents consists of data items (variable values; fields) separated by commas, with a carriage return after the last item of the group of items to be used in one letter (or other document).

There must always be the same number of items on a line (record), with commas present to "hold places" for any items which are omitted.

To include a comma, or leading or trailing blanks, in an item, enclose the item, or at least the comma or blanks, in quotes("").

Data files may be prepared with WordStar (use the N command) or DataStar.

For DataStar compatibility, any data file line containing FF hex or 7F hex in the first byte is ignored.

Example: three valid lines (records) of a data file:

```
NORCAL Computers,1500 Highland Avenue, "Alameda, California", 94501, Mr. Smith
TRIAD, 1829 Santa Clara Road, "Malad City, Idaho", 83251, John
Wolcott Associates, 16 Rue Diesal, "Casteau, Belgium", APO 09055, Mr. Baudoin
```

(Carriage returns may be used as an alternative to commas between items. Such use improves screen readability when the data file is created with WordStar, but use of carriage returns is discouraged because it reduces MailMerge's tendency to get "back in sync" after an omitted data item or comma, and because it prevents processing the data file with SuperSort to select records or place them in alphabetical or Zip Code order.)

Form Letter Using a Data File

```
.OP                               omit page numbers
.DF datafilename
.RV variable1, variable2, variable3, . . . (must match data file)

    text of letter, using &variable&'s as desired

.PA                               start next letter on new page
```

Form Letter Using Operator Data Entry

```
.OP                               omit page numbers
.CS                               clear screen (optional)
.AV "prompt", variable1
.AV "prompt", variable2
. . .                             (one .AV for each variable)

    text of letter, using &variable&'s as desired

.PA                               start next letter on new page
.FI nameofthisfile               (if automatic repeat desired)
```

"Document" to Print/Check Data File

```
.DF datafilename
.RV variable1, variable2, variable3, . . .

.CP n                n=# variables
&variable1&
&variable2&
&variable3&
. . .
```

Two Useful Command FilesOperator Entry of Data Once at Beginning of Form Letter Run

```
.AV "Today's date", date
.FI letterfile
..
```

letterfile is a document in one of the forms shown above, using &date& where today's date should print.

Operator Entry of Data File Name

```
.AV LETTERFILENAME
.AV DATAFILENAME
.FI &LETTERFILENAME&
..
```

letter file whose name operator enters is a document in data file form shown above, but containing
.DF &DATAFILENAME&

MailMerge Dot Commands

MailMerge also does the regular print dot commands (Section 7). In the following tables (A-4 and A-5), brackets enclose optional parameters.

Table A-4. MailMerge Dot Commands

<u>Command</u>	<u>Function</u>
.DF filename [CHANGE]	Data File: Specifies data file to be used. CHANGE, if given, requests diskette change.
.RV variable1, variable2,...	Read Variables: Gives names and order of variables to be read from data file. List of one or more variable names must correspond in number and order to data items in data file.
.RP [n]	Repeat: If n given, document is processed n times. If n omitted, document is processed until data file exhausted. The function of .RP with no n is included in .DF; command is needed only if a different (inserted) document is to be repeated.
.SV variable, value	Set Variable within document: named variable is set to value on rest of line.

Table A-4. MailMerge Dot Commands (Continued)

<u>Command</u>	<u>Function</u>
.AV ["prompt"], variable, [length]	Ask Operator for Variable Value: Prompts on screen and allows operator to enter data. "prompt" optional prompt text, in quotes. If omitted, variable name used. variable identifies variable for which operator will enter data. length optional maximum length
.DM [message]	Display Message: Displays message (rest of line) on screen. Leaves blank line if message omitted.
.CS [message]	Clear Screen and display optional message.
.FI filename [CHANGE]	File Insert: Specified file is inserted in printout at position of .FI command. File will be inserted multiple times (processed repeatedly) if it contains .DF/.RV or .RP.

The commands after .PF in Table A-5 are effective only if .PF ON has been given, or if a variable reference has already been seen in the current paragraph. For each, DIS is the default and means "match the input".

Table A-5. MailMerge Dot Commands for Print-Time Line-Forming

<u>Command</u>	<u>Function</u>
.PF ON/OFF/DIS	Print-Time Line-Forming ON or OFF or DIScretionary. DIScretionary (default) means form lines from variable reference to end of paragraph only.
.RM n/DIS	Right Margin 1 to 240 or DIScretionary.
.LM n/DIS	Left Margin 1 to 240 or DIScretionary.
.LS n/DIS	Line Spacing 1 to 9 or DIScretionary.
.OJ ON/OFF/DIS	Output Justification ON or OFF or DIScretionary.
.IJ ON/OFF/DIS	Interpret Input as Justified ON or OFF or DIScretionary: affects method of determining right margin if .RM DIS is in effect, and determines output justification if .OJ DIS is in effect.

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Appendix B WordStar Error Messages

This appendix contains explanations of WordStar's error and warning messages. Additional error messages that can occur while INSTALLing WordStar are described in the **Installation Manual**.

THE DISK TEXT FILE

Many of WordStar's messages are read in from a disk file WSMMSG.S.OVR as they are needed for display. This includes most error messages, the menus, and many explanatory messages. The messages are stored in a disk file in order to reduce WordStar's RAM requirements while allowing full, understandable message and explanation texts and multiple menus.

When WordStar is in use, the file WSMMSG.S.OVR should always be on disk drive A. If disks are changed during WordStar use, be sure to keep a disk containing WSMMSG.S.OVR in disk drive A at all times. Operation of WordStar without WSMMSG.S.OVR present is normally an error, but experienced users may operate WordStar thus if desired.

If the message text file is not present, the following message appears:

```
@@@  
File WSMMSG.S.OVR not found. Menus &  
messages will display as @@@ only.
```

WordStar will continue running, but many messages will be replaced with "@@@"; in particular, the menus will appear as @@@ only. Hence WordStar sets the "Help Level" to 0 if WSMMSG.S.OVR is not present to minimize the display of messages and menus.

THE ERROR RELEASE KEY

A number of the edit function errors require the user to hit the ESCAPE key after the error message is displayed. This is to make sure the message stays on the screen until read, and to insure that WordStar does not proceed to the next command even if the user has typed ahead. The messages for most of these errors have the form:

```
*** ERROR n: (specific message) *** Press ESCAPE Key █
```

When such a message is displayed, WordStar forgets any typed ahead characters and ignores further input until an ESCAPE is typed. Editing then continues; the command that caused the error usually will have made no change in the file and not moved the cursor.

If such an error occurs when the disk message text file (previous subsection) is not available, the message will appear as:

```
*** ERROR n: @@@ *** Press ESCAPE Key █
```

The @@@@ is printed in place of text that would have been obtained from WSMGS,OVR had that file been present. The number (n) remains the same, so the message may be found in the following section.

EDIT FUNCTION ERROR MESSAGES

*** INTERRUPTED *** Press ESCAPE Key ■

Occurs when the "interrupt" key, ^U, is pressed. This isn't actually an error, but the error message mechanism is used to call attention to the fact that the command in progress has been aborted and/or additional typed-ahead characters have been discarded. Hit the ESCAPE key and continue editing. Does not occur if ^U is typed when there is nothing to interrupt.

*** NOT FOUND: string *** Press ESCAPE Key ■

Occurs when the Find (^QF), Replace (^QA) or Find/Replace Again (^L) command cannot find the specified string between the cursor position and the end of the document (beginning if B option used). The user's answer to the FIND? question is included in the message. The cursor is left at the end (beginning) of the document.

The ^QV command may be entered after a NOT FOUND message to return the cursor to the starting point. If a repeat count or the G option was given, this will be the position of the last occurrence found. Also, ^QP may be entered immediately after hitting ESCAPE to return the cursor to the position where the command was given, even if a count or the G option was used.

When a repeat count is specified, this message will occur if fewer occurrences are found. With the G (global) option, the message will occur only if no occurrences are found.

*** ERROR E5: THAT PLACE MARKER NOT SET *** Press ESCAPE Key ■

You gave a "move cursor to place marker" command for a place marker that you have not set since you began editing the file you are now editing. As described above, press the ESCAPE key to release the error message and continue.

*** ERROR E6: BLOCK BEGINNING NOT MARKED (OR MARKER IS UNDISPLAYED) *** Press ESCAPE Key ■

You gave a block move (^KV), block copy (^KC), block delete (^KY), or block write (^KW) command without first marking the beginning of the text to be operated on with the mark block beginning command (^KB). As with all error messages containing "Press ESCAPE Key", press the ESCAPE key to release the error.

To tell WordStar where the beginning of the block of text to move, delete, etc. is, position the cursor on the first character in the block, and type ^KB. After marking both the beginning and the end, repeat the command that yielded the error.

ERROR E6 also occurs after "hiding" (undisplaying) the block beginning marker with ^KB (cursor already at marker) or with block hide/display (^KH). In these cases the existing marker can be redisplayed with another block hide/display command (^KH).

***** ERROR E7: BLOCK END NOT MARKED
(OR MARKER IS UNDISPLAYED) *** Press ESCAPE Key ■**

Similar to error E6 except end is not marked. To tell WordStar where the end of the text to operate on is, place the cursor on the CHARACTER AFTER the last character to move, delete, etc, and type ^KK. After marking the end of the block (or causing the marker already set to display), repeat the command that gave the error.

***** ERROR E8: BLOCK END MARKER BEFORE BLOCK BEGINNING MARKER
*** Press ESCAPE Key ■**

You have put the end marker earlier in the file than the beginning marker, and it is not clear to WordStar what text to block move, copy, delete, or write. Correct the markers, then reissue the command that gave the error.

***** ERROR E9: BLOCK TOO LONG -
MOVE OR COPY IN TWO SMALLER BLOCKS *** Press ESCAPE Key ■**

The amount of text between the beginning and end markers is more than WordStar can block move or copy. Operate on it in two or more smaller pieces.

Users with minimal RAM will see this message a lot; with more RAM, it will occur less often. The number of characters that may be in a block is about 500 in the smallest RAM that WordStar will operate in and every added K of RAM adds 1024 characters to the maximum block size. Adding 8K of RAM memory to your system adds about 8000 characters to the block size, making it possible to move seventeen times as much text.

The block write command is not subject to any block size limitation.

***** ERROR E10: CURSOR NOT IN RANGE FOR COLUMN MOVE / COPY
*** Press ESCAPE Key ■**

In WordStar, neither column move nor column copy is possible when the cursor lies in a negative print position or past column 240.

***** ERROR E11: THAT FILE EXISTS ON DESTINATION DISK.
DELETE EXISTING FILE FIRST,
OR USE A DIFFERENT DISK. *** Press ESCAPE Key ■**

This message only occurs when you have specified that a file on one disk be edited and the new version be placed on a different disk. See "Starting WordStar", Section 1 and the D command in Section 1. This message indicates that a file with the same name already exists on the destination disk drive (the second disk drive name given). If WordStar proceeded in this situation, the existing file on the destination disk would be lost. This error prevents inadvertent file destruction.

After the **ESCAPE** key is pressed, WordStar goes to the no-file menu; the requested edit is not initiated. From the no-file menu you can delete the existing file if desired, then re-invoke the edit with the **D** command. Alternatives include inserting a different disk to accept the destination file, and exiting to the operating system and using the **REName** command to change the name or type of one of the files.

Can't edit a file of type **.BAK** or **.\$\$\$**
-- **rEname** or **cOpy** the file before editing

Occurs at **D** or **N** command from no-file menu if the file name entered ends in **.BAK** or **.\$\$\$**. The edit is not initiated and the no-file menu remains on the screen. If you really wish to edit the file, rename (with the **E** command) the file to a different type. Alternately, for a file of moderate size, you could edit a new file name and then read the **.BAK** or **.\$\$\$** file into it with the additional file read (**^KR**) command.

ALLOW PRINT TO FINISH BEFORE EDITING A FILE.
YOUR SYSTEM DOES NOT HAVE ENOUGH MEMORY TO
PERMIT SIMULTANEOUS EDITING AND PRINTING.

Occurs at **D** or **N** command from no-file menu if the print function is in use and your system has relatively little memory, or the operating system is not relocated to make all memory present available to WordStar (see description of error **F25** in this appendix). The edit is not initiated; the no-file menu remains on the screen. See the **Installation Manual** with regard to memory requirements.

***** ERROR E12: DISK FULL *** Press ESCAPE Key ■**

The disk is full. May occur when moving cursor towards beginning of a large file (see "Long Documents," Section 6), in which case it will still be possible to move the cursor toward the end of the file and to save your work. If it occurs while moving cursor forward or while saving, you are probably out of luck. **DON'T LET YOUR DISK GET FULL!**

To prevent full disks, check your file sizes and disk space frequently with the system file status utility, and keep lots of extra space on each of your disks. See the **General Information Manual** for further discussion of disk space.

Suggestions for recovering from a **DISK FULL** error:

1. If cursor was being moved toward the beginning of a large file (see Section 6) and you haven't already tried to save the file, it may still be possible to move it toward the end. In that case, get back to the beginning by **SAVING** with **^KS**, then move **FORWARD** to the desired position.
2. If cursor was being moved toward end of the file, or the **DISK FULL** error occurred while saving, first delete (**^KJ** command) any unneeded files. You could also delete any file that you know you could replace later from another disk, including **WS.COM** or even **WSMSG.S.OVR**. Proceed with your edit, and remember to arrange more disk space (e.g. by moving some documents to a different disk) after saving.

3. If deleting files doesn't allow you to complete your edit, and you don't have much work to lose, abort the edit, make more disk space available (erase unwanted files or move some files to another disk), then repeat the edit.
4. If you have made substantial changes or additions, and thus don't want to abort the edit, yet can't get enough space to complete the edit by deleting files, one of the following drastic measures may work:
 - a. If there is extra space on the other disk drive, try putting the changed portions of the file on it with block write. Then recombine in a subsequent edit after arranging more disk space.
 - b. Delete unchanged portions of the file until saving does not yield a DISK FULL error. Then recover these portions from the BAK file or from a previous backup copy you (hopefully) kept.
5. If the DISK FULL arises out of a block write (^KW) command, the above recoveries are not relevant. Delete (^KJ) the file written, as it is incomplete and not "closed". If you can arrange additional disk space by deleting other files or using a different disk drive, repeat the block write. Then proceed with your edit.

Sometimes as soon as you hit the ESCAPE key, another DISK FULL error will occur. In this case your disk is really full and you are out of luck. Don't let this happen — watch your disk space!

THE BEST CURE FOR DISK FULL ERRORS IS PREVENTION!

***** ERROR E13: COLUMN READ / WRITE NOT ALLOWED *** Press ESCAPE Key ■**

The 3.0 version of WordStar does not allow column read/write. You can, however, duplicate the effects.

To read a column into one file from another, first change column mode to block mode with ^KN; then read a block containing the column to the end of the destination file. Turn column mode on again (^KN), mark the column desired, and move the column to the desired location with ^KV. Finally, delete the remainder of the text block from the end of the file.

To write a column from one file to another, copy the column, with column mode ON, from its original spot to the end of that file; then change to block mode (^KN) and write the column to the second file. Delete the column from the end of the original file.

FILE filename NOT FOUND

The file named in response to the FILE NAME? question asked by the additional file read command (^KR) or the print command (Section 8) does not exist. The actual name you typed appears in the message; the message appears on the screen below the FILE NAME? question, and the cursor is replaced after the question. Enter the corrected name -- be sure you include the disk drive if needed -- or just enter RETURN if you don't want to complete the command. Forward cursor (^D) and ^R can be used to bring back characters from the previous answer without retyping them (Section 1).

INVALID FILE NAME: xxxxxx

Similar to the previously described error; whatever you typed in response to the question (echoed back in the message where xxxxxx is shown above) was not a correctly formed file name. File naming is described in the **General Information Manual** and is detailed in your system documentation; the D command summarizes the form of file names on the screen.

Note

WordStar will not accept "wild card" file names containing * or ?; those characters get the above error.

*** INTERNAL ERROR I15: INVALID COPY LENGTH *** Press ESCAPE Key ■

*** INTERNAL ERROR I16: INVALID ADDRESS *** Press ESCAPE Key ■

*** INTERNAL ERROR I17: MEMORY FULL *** Press ESCAPE Key ■

*** INTERNAL ERROR I18: MEMORY SHORTAGE *** Press ESCAPE Key ■

*** INTERNAL ERROR I19: POINTER > 64K FROM CURSOR *** Press ESCAPE Key ■

*** INTERNAL ERROR I36: BAD OVLY # *** Press ESCAPE Key ■

The above are internal errors which should not occur. If one does occur, saving immediately and exiting to the operating system is recommended. Make a copy of the .BAK file, as the internal error may have garbled your document. Then reinvoke WordStar and check your file. If one of these errors is reproducible (i.e. if you can find a reliable way to make it happen again), please report it to your dealer.

WARNINGS

The following are warnings, for your information. See also Print Function Warnings.

***** WARNING: WORD TOO LONG TO FIT MARGINS**

When forming a line, WordStar found more characters than would fit between the currently set left and right margins with no word break (space or hyphen). For example, if you type a line of *'s across the screen, (e.g. as part of a table heading), with word wrap on and the margins not released, this message will appear when it gets wider than the margins. You can leave it too wide, or delete the excess *'s, depending how you want the page to appear. The message will also appear on a "word" too long during paragraph reform (^B).

When a "word" is too long, WordStar looks about 10 characters beyond the margin for a break. If found, it is used, and the "word" is allowed to project into the right margin. If not found, the word is split AT the margin.

CAN'T DISPLAY PAGE BREAKS IN A NON-DOCUMENT FILE

An ^OP command was given during a "non-document" edit invoked with the N command (Sections 1 and 6). The command was disregarded.

PUT AT FILE BEGINNING FOR CORRECT PAGE BREAK DISPLAY

This appears, highlighted, ON THE SCREEN LINE with a .PL, .MT, .MB, or .LH dot command that is preceded by document text (anything, including blank lines, other than dot commands) when page break display is on. The intent of this message is to remind you that dynamic page break display will not pick up and respond to this dot command, and thus may show different page breaks during editing than will occur on printout. The command is nevertheless entered into the file, and will be interpreted by the print function. The message is on the screen only; it is not entered into your document. This message does not appear if page break display is off (^OD command) or during non-document edits (N command, Section 6).

?

A question mark appears in the rightmost screen column, highlighted, opposite incomplete or apparently erroneous dot commands. An unrecognized two-letter code, a missing numeric argument where required, or a number greater than 255 (except with the .PN command) will cause a ? to display. Also appears as a command is being entered; disregard until command is fully typed. Does not appear during non-document edits (N command, Section 6).

File WSMMSG.OVR not found. Menus & messages will display as @@@@ only.

Occurs when WordStar is started, when at the no-file menu, and/or when editing of a file is initiated if the message text (WSMMSG.OVR) is not found on disk drive A nor on the current logged disk drive. See "The Disk Text File" in this appendix.

@@@

The disk text file WSMMSG.S.OVR is not present, and WordStar tried to display some message or menu (including the no-file menu) from that file. See "The Disk Text File" at the beginning of this section.

Note

The most common and important error messages will display even if WSMMSG.S.OVR is not on line, or will display part of their text (including the error number, if any), followed by @@@. However, the menus will be completely unavailable and only @@@ will appear at the top of the screen.

***** WARNING:
WRONG VERSION OF WSMMSG.S.OVR --
SOME MESSAGES MAY BE INCORRECT *****

Occurs if the disk text file WSMMSG.S.OVR in use is that from a different release than the WordStar (WS.COM) being run. The message file may not contain all of the correct messages; some messages may be absent. WordStar execution continues; an attempt to display a message not in the text file will yield: IF THIS DISPLAYS YOU ARE USING WRONG VERSION OF WSMMSG.S.OVR.

Exception: the first release of WSMMSG.S.OVR did not contain the WRONG VERSION OF WSMMSG.S.OVR warning; use of a later WS.COM with the earliest WSMMSG.S.OVR will cause IF THIS DISPLAYS THERE IS A BUG to display.

!'s and beeps

!'s appear on the screen, wherever the cursor happens to be, usually accompanied by beeps from the terminal, when WordStar is receiving keyboard input at a faster rate than it can process and has exhausted its capacity to store characters for later processing. This normally occurs only when using the REPEAT key on the terminal, or holding down an auto-repeat key. The !'s and beeps are to warn you that WordStar is losing keystrokes; stop typing or release the key you are REPEATING when they occur. After processing all characters not missed, WordStar will re-display the screen, removing the !'s. You may then continue editing.

***** WARNING: DISK FULL,
DELETING OLD .BAK FILE TO MAKE SPACE
(NORMALLY, THE PREVIOUS BACKUP FILE IS DELETED
ONLY AFTER EDIT IS SUCCESSFULLY COMPLETED).**

If you are working with files of moderate size, take this as a warning that your disk is filling up. Save the document you are working on, and make more disk space available (by deleting unwanted files, or moving some files to new disks) before proceeding. See the **General Information Manual** about disk space and file sizes and about .BAK files.

When working with files so large that three copies of the file cannot fit on a disk (two copies if you have specified a different destination disk), this message will always occur in the course of an edit. Disregard it. See Section 6, "Long Documents."

WARNING: You are editing the same file as you are printing. WordStar will not allow you to save the edited version until the print has completed or has been abandoned.

WordStar permits editing and printing the same file at the same time, but the edited version cannot be saved while the print is in progress. When you initiate editing of the file that is being printed, the above warning message is displayed.

INFORMATIONAL MESSAGES

FINISHING PRINT BEFORE EXIT
(type ^U to cancel exit command) ...

Occurs if an X command from the no-file menu, or a ^KX command while editing, is given while the print function is active. Printing will continue; the exit to the operating system occurs when printing completes.

FINISHING PRINT OF SAME FILE BEFORE SAVING
(Type ^U to cancel Save command) ...

Occurs when any Save command (^KD, ^KS, ^KX) is given while the file that is being edited is also being printed. WordStar will wait for the print to complete, then save. If you wish to use other commands before the print and save are complete, interrupt the save command by typing ^U. Note that if printing is paused, WordStar will wait forever if left to itself. In this case, type ^U to cancel the save command, then issue the appropriate commands to continue or abandon printing.

FINISHING PRINT OF .BAK FILE BEFORE SAVING
(Type ^U to cancel Save command) ...

Occurs if any Save command is given while printing the .BAK file of the file being edited; similar to preceding message.

FATAL ERRORS

The following errors terminate WordStar execution and return control to the operating system.

You are attempting to run an uninstalled WordStar.
Please run INSTALL first.

Occurs upon invoking the uninstalled WordStar (file WSU.COM) supplied on the distribution disk. Before trying to run WordStar, "Install" WordStar for your particular terminal and printer by invoking the INSTALL program, also supplied on the distribution disk, and answering the questions it asks. See the **WordStar Installation Manual** for details on installation.

***** FATAL ERROR F23: INVALID SCREEN HEIGHT OR WIDTH**

This can occur only after an error has been made in custom installation by "patching" as described in the **Installation Manual**. The screen height is set less than 16 or greater than 120 lines, or the screen width is set less than 64 or greater than 250 columns.

***** FATAL ERROR F25: NOT ENOUGH MEMORY**

Occurs when WordStar is started. Not enough memory is available for WordStar to operate in. 64K is the minimum memory requirement.

***** FATAL ERROR F27: DISK DIRECTORY FULL**

The number of file directory entries a disk can hold has been exceeded. This happens rarely, as the byte capacity is usually the ruling factor, but if you use many small files, such as 1-page letters or paragraphs of boiler plate, you may find it necessary to watch your file count.

The maximum number of file directory entries on a disk is system-dependent but is often 64 entries on single density disks. Each file requires one entry, and any file over 16K (about 16000) characters long requires an additional entry for each additional 16K or fraction thereof. When counting files remember that WordStar can generate two working files, each possibly as long as the file being edited.

***** FATAL ERROR F28: CLOSE FAILURE
SYSTEM FAILURE, OR YOU CHANGED DISKS******* FATAL ERROR F29: RENAME FAILURE
SYSTEM FAILURE, OR YOU CHANGED DISKS**

These messages should not occur; they indicate some sort of operating system error has occurred, or you changed the disk in a drive during an edit, or you deleted the input file or the work file with the ^KJ command.

***** FATAL ERROR F46: Overlay file WSOVLY1.OVR Not found**

The file WSOVLY1.OVR must be on disk A (or the current logged disk drive) when WordStar is invoked. Copy the file from the distribution disk (or log the disk drive containing the file), then re-invoke WordStar.

PRINT FUNCTION MESSAGES

The following messages can occur during the dialog to initiate printing:

FILE filename NOT FOUND

INVALID FILE NAME: xxxxxx

Name of a non-existent file, or an invalidly formed file name, entered. Descriptions earlier in this appendix apply.

WARNING: You are printing the same file as you are editing. The last saved version will be printed, not reflecting unsaved changes. Furthermore, WordStar will not allow you to save the edited version while the print is in progress.

This warning occurs when the ^KP command is used to initiate print and the file name entered is that of the file being edited. The warning reminds you that WordStar does not permit saving (^KD, ^KS, ^KX) while the same file is being printed, and that WordStar prints only disk-saved files -- edits you have not yet saved will not be printed.

**END EDIT (^KD) BEFORE STARTING PRINT.
YOUR SYSTEM DOES NOT HAVE ENOUGH MEMORY TO
PERMIT SIMULTANEOUS EDITING AND PRINTING.**

Occurs when the ^KP command is given if your system has insufficient RAM to support concurrent printing and editing. (May also occur if your operating system isn't relocated to make all RAM available; see the description of error F25 in this appendix.)

When DISK FILE OUTPUT is in use, the following can occur:

***** FATAL ERROR F27: DISK DIRECTORY FULL**

As described in this appendix.

***** PRINT OUTPUT DISK FULL. PRINT PAUSED. *****

Occurs when the disk on which the print output file is being written becomes full. A print pause is automatically invoked; PRINT PAUSED appears in the status line as usual. After this message, you may make additional disk space available (for example, by deleting files; see discussion of ERROR E12 earlier in this section), then continue the print with the usual command (P on no-file menu, or ^KP while editing). If you continue the print without making more disk space, the PRINT OUTPUT DISK FULL message will recur after about a second.

If you wish to abandon the (paused) print after the output disk has filled up, type two print commands in rapid succession, then answer Y to the question evoked by the second print command -- that is, at the no-file menu, type PPY; while editing, type ^KP^KPY. After abandoning, you will probably want to delete the disk output file, since it will be incomplete and not "closed". Be sure to abandon the print before deleting the file.

Other than the above, the regular print function has no error messages - other conditions, such as invalid dot commands, are handled by ignoring the command or making an assumption. See Section 7.

SOME OPERATING SYSTEM MESSAGES

These are some of the messages from the operating system that may arise in conjunction with WordStar use. Texts vary from system to system; those shown here are typical only. Refer to your system documentation.

LOAD ERROR or TOO BIG

Occurs at attempt to invoke WordStar if you have far too little memory. This message means that the WordStar program won't fit in the memory available.

DISK d: NOT READY

Means that WordStar accessed a disk drive that contained no disk or the disk was present but the drive door was not closed. WordStar always requires a disk in drive A, and in the current logged disk drive if other than A, as well as in any disk drive addressed by a WordStar command. Most systems will proceed when the disk is inserted. The message may appear if a disk is inserted and a command is then given without waiting a few seconds; in this case, disregard it.

BDOS ERR R/O

Occurs on some systems if you change disks when you shouldn't, or changed disks when at the system prompt and neglected to type ^C. If you get this message, reread the section in the **General Information Manual** about disk changing.

MISCELLANEOUS ERROR MESSAGES

***** ERROR E38(-42): BAD OVERLAY FILE, OR
WRONG VERSION OVERLAY FILE *** Press ESCAPE Key ■**

***** ERROR E43(44): WRONG VERSION OVERLAY FILE *** Press ESCAPE Key ■**

The above errors are usually caused by using an incorrect version of WSOVLY1.OVR (from a different release of WordStar), or by the WSOVLY1.OVR file having been damaged through a system failure or an error in copying. Make a new copy of WSOVLY1.OVR from your distribution disk. If the problem persists, see your dealer for assistance.

***** ERROR E46: Overlay file WSOVLY1.OVR Not Found *** Press ESCAPE Key ■**

The WSOVLY1.OVR file (supplied on the distribution disk) must be on disk drive A or the current logged disk drive.

***** ERROR E47: FILE MAILMRGE.OVR NOT FOUND
(The separately sold file MAILMRGE.OVR is
required for use of chosen function.) *** Press ESCAPE Key ■**

This message will be displayed if M is entered at the no-file menu and the file MAILMRGE.OVR is not on disk drive A or on the disk in the current logged disk drive.

***** ERROR E52: PROGRAM IS AN EMPTY FILE!? *** Press ESCAPE Key ■**

This message may be displayed when the name of a file which is not a valid program is entered during use of the R command of the no-file menu.

***** ERROR E53: PROGRAM TOO BIG FOR
MEMORY AVAILABLE UNDER WordStar *** Press ESCAPE Key ■**

There is not enough memory on your system to run the specified program under WordStar. To run the specified program, you must exit from WordStar.

**File WS.COM Not Found --
Can't Run a program unless WS.COM is available.**

WS.COM (or other filename assigned when INSTALLED) was not found on either disk drive A or on the current logged disk drive. WS.COM must be available in order to return to WordStar after completing the specified other program.

Note

This error will occur if WS.COM has been renamed since INSTALLATION. If you wish to change the name of your WS.COM file, you must re-INSTALL. To re-INSTALL without remaking all the installation selections, use installation option B or C (**Installation Manual**), enter the existing file name and the desired new file name at the appropriate prompts, then use the RETURN key at each menu to keep the present selection.

FILE d:filename ALREADY EXISTS

The new file name specified in the rENAME command already exists. Choose a different name or rENAME the existing file.

FILE d:filename NOT ON SAME DRIVE

Both filenames specified for the rENAME command must be on the same disk drive; you can not move a file from one disk to another by rENaming.

TOO LITTLE MEMORY TO COPY WHILE EDITING

Your system does not have enough memory available to copy files while editing. If you want to copy a file, you must first end or abandon the current edit.

FILE d:filename EXISTS -- OVERWRITE? (Y/N): ■

This message will be displayed if the file specified to be copied to already exists. Press Y to erase the existing contents of the file and proceed with the copy. Press N to leave the existing file undisturbed; the NAME OF FILE TO COPY TO? question is reasked if N is pressed.

MAILMERGE ERROR AND WARNING MESSAGES

MailMerge has a number of error and warning messages, including those described here. Unlike the regular print command, MailMerge always displays an error message for an invalid dot command. Other conditions also produce messages, such as a file not found, or the data file ending in the middle of the values required to print another letter. In all cases, printing proceeds after the error or warning (permitting detection of as many errors as possible in a single print run), though of course the printout may be incomplete or incorrect.

***** Invalid Dot Command Ignored:**

The erroneous dot command is displayed on the next line. In some cases, a specific error message accompanies this message.

***** Insert disk with file d:filename then press RETURN**

This is not an error message, but a request to insert the disk containing the indicated file into the drive indicated before the filename. This request results from processing of a .DF or .FI dot command containing the word "CHANGE" (or anything beginning with "CH") after the file name.

***** Cannot change disk in drive d:, request ignored**

This error message occurs when a .DF or .FI dot command containing the word "CHANGE" after the file name is processed, and the disk drive specified in the file name (or the logged disk drive if no specific disk drive was specified) contains a file which is in use by MailMerge, preventing removal of the present disk.

To avoid this error, we recommend keeping WSMGS.OVR, WSOVLY1.OVR, the main document being printed, the disk output file if in use, and all data files and inserted document files used by the main document but not on disks to be changed, on disk A, and use disk B (in a two disk drive system) for CHANGE files, using only one CHANGE file at a time.

After the above message is displayed, MailMerge will attempt to find the file anyway, in case the correct disk is already inserted. If the file is not found, the message described next occurs.

***** File d:filename Not Found**

The file specified in a .FI or .DF dot command was not found on the specified disk, or on the logged disk if no disk was specified in the command. MailMerge will look further (see next message), then, if the file is not found, proceed without it: for a .FI command, printing will continue with the line after the .FI command; for a .DF command, printing will continue with no data file, in which case a further message will appear when a .RV command is encountered.

***** But found, and will use, d:filename**

After a file was not found (see preceding message), MailMerge looked on the logged disk and on disk A for a file with the same name, and found one. This message advises you of this fact. If the file was merely on the wrong disk (or you had the wrong disk logged), this may be the correct file. However, if you had a file with the same name but different contents on another disk, this may be the wrong file and the resulting printout may be wrong. Check carefully.

***** No .DF before .RV**

A .RV command was encountered with no preceding .DF, or the data file specified in the .DF was not found (as indicated by a preceding message). If no File Not Found message appears above on the screen, check your document to make sure the .DF is present and before the .RV. Printing proceeds with no data supplied for the variables; the variable names and &'s will print and only one copy will be printed.

***** WARNING: Overlong data value truncated**

One or more data items longer than the maximum allowed variable value length, 200 characters, was read from the data file by a .RV command. Only the first 200 characters will be used; the excess may be skipped over or may be used (incorrectly) as the value for the next variable to be read. May indicate an error in data file format, such as an omitted second quote (").

***** Invalid variable name in .RV command ignored**

One or more of the variable names in a .RV command was not of valid form, i.e. a letter followed by 0 to 39 additional letters, digits, or -'s. May indicate that &'s were used around the variable names in the .RV command; &'s should NOT be used in the .RV command (except in the case of inserting one previously defined variable value into the .RV command to determine the name to be applied to another data item read from the data file).

***** WARNING: Data exhausted, null value(s) used**

The end of the data file was reached in the middle of execution of a .RV command — the last record of the data file did not contain the number of items required to print another letter (or other document). The variable names for which no data is present are given "null" values (values consisting of zero characters) and printing proceeds. Printing will normally stop after the letter on which this message occurred is complete.

This message commonly indicates an error in the last record of the data file only, but may indicate use of the wrong data file (one with an inappropriate number of data items per record), or indicate that an omitted item or comma earlier in the file caused the data file to get "out of synch" with the letters. (The latter case of getting and staying "out of synch" can only occur if carriage returns are used in the data file between items for the same letter as well as between records; use of commas only is encouraged to facilitate "re-synching" after an omitted item.)

Note

This message will occur only when the end of the data file is reached, even if earlier errors or the presence of fewer variables in the data file record (line) than in the .RV command has caused incorrect matching of data throughout the print run, because if .RV finds insufficient values on a data file line, it proceeds automatically to following lines until enough data has been found.

Note

Each time the end of a document being repeatedly processed under .DF/.RP is reached, MailMerge looks ahead in the data file, passing up all carriage returns and blanks present, to see if more data is present. If the end of the file is reached before any non-blank, non-carriage return character is found (as it will be after the last letter if the data file matches the document correctly and has a correct last record), then the document is not processed again, and printing terminates without the above message occurring.

If you are printing a document which reads multiple "records" for each printout (on each repetition of processing), the above message may normally occur. For instance, a document that prints 3-up address labels would read three name and address records (typically with three .RV's) on each repetition, then print the three labels. This document would get the above warning at the end unless the number of records in the data file happened to be a multiple of three; the warning may be disregarded in this case. The one or two labels for which no data was present would print blank, since .RV automatically supplies null values for the absent data.

SPELLSTAR ERROR AND WARNING MESSAGES**E101: File not found on disk: d:filename**

The file shown in the message was specified as one of the following SpellStar files:

- a. the main or supplemental dictionary for the check operation,
- b. the document file to be checked, or
- c. the file containing words to be added to or deleted from a dictionary.

This file was not located on the disk specified or, in the case of a file with extension name "DCT" or "SUP", was also not located on the currently logged disk drive.

If the file name or disk drive was entered incorrectly, restart SpellStar by responding "R" to prompt, then enter the correct file name or extension. If the file name and disk drive were correct, respond "R" to prompt, then exit to WordStar to find or create the desired file.

E102: Error during sort.

This message occurs whenever the internal SpellStar sort program (MicroPro's SuperSort) encounters any problem executing the requested sort operation. The specific failure will have been explained in a preceding message. See SuperSort reference manual for a detailed explanation of the problem. In most cases, the failure will have been insufficient sort work space.

To recover from the insufficient space condition, respond to the prompt with "R" to restart SpellStar and then either select a different disk drive for the "work drive" control or change the disk to one with more available space. If neither of these actions can be taken, exit to WordStar and delete unneeded files from the disk to make available at least as much space as is currently used by the file being checked or the file containing the words to update a dictionary, depending on the operation being performed.

E103: Invalid word format in "add" file.

When executing the Dictionary Maintenance operation, an input word file was specified with the file name extension of "ADD", but the internal contents did not contain the word format expected by SpellStar. The "add" format is unique to files created by WordStar in the spelling correction phase when a word is selected for adding to the main or supplemental dictionaries.

Respond "R" to the prompt to restart SpellStar, exit to WordStar to rename your word file to any name having an extension other than "ADD", then start SpellStar again.

E104: Disk full while writing file d:filename.
Enter any key to restart.

While writing any of SpellStar's work or output files, the destination disk became full. SpellStar is unable to proceed.

After hitting any key to restart SpellStar, follow the action described for error E102.

W110: Invalid character in dictionary. Word Dropped: xxxxx

When adding words to a dictionary, SpellStar encountered a word containing a character other than a letter or the apostrophe character. The word is shown in the message (replaces the xxxxx). This condition should not occur and may signal a program failure or some unexpected condition on disk.

SpellStar will continue after dropping this word from its operation. The proper word can be added in a later run. If this condition persists without a reasonable explanation, please notify your dealer.

W180: Memory exceeded. Partial words flagged.

In the final phase of SpellStar, there was not sufficient memory in the computer to hold all of the misspelled words. SpellStar was forced to flag only the words which would fit and ignore the rest.

After the flagged words are corrected with SpellStar, rerun the correction operation to examine and correct the remaining words.

W181: Word exceeds max length. Words bypassed.

In the final phase of SpellStar, words of length greater than thirty-five letters were misspelled. SpellStar can not process these words and therefore must bypass them.

Words longer than thirty-five letters must be checked for correct spelling by user examination only.

E190: Insufficient memory for file areas.

There was not enough computer memory to correctly process opening any of SpellStar's files.

SpellStar requires a minimum of forty-eight K (blocks of 1024 bytes) of memory. If your system has less memory than this minimum, please contact your dealer for assistance.

E191: Invalid record format in intermediate file.

This condition occurs when SpellStar encounters an unexpected record format within one of its internal work files.

During the operation a bad sector may have been used by SpellStar. Respond with "R" to the prompt to restart SpellStar, replace the work disk or change the work drive control in the menu, then restart the operation. If the condition persists without a reasonable explanation, please contact your dealer for assistance.

E192: Insufficient memory for table area.

In the final phase of SpellStar, not enough computer memory was available to store the misspelled words found in the text.

SpellStar requires a minimum of forty-eight K (blocks of 1024 bytes) of memory. If your system has less memory than this minimum, please contact your dealer for assistance.

E193: Invalid character format in dictionary.

During the dictionary checking operation, SpellStar encountered an unrecognized character format in the main or supplemental dictionary. This could be caused by using a non-SpellStar dictionary (that is, one that has not gone through SpellStar's maintenance operation), or could be caused by a disk sector read error.

To restart SpellStar, enter any key. If you were using a SpellStar dictionary, the file may need to be restored from a backup disk to eliminate any sector errors if they occurred. If you were using a dictionary not created by SpellStar, use the dictionary maintenance operation to create a SpellStar dictionary from the file of words. If this error persists without a reasonable explanation, please contact your dealer for assistance.

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A P P E N D I X C

APPENDIX C

Appendix C contains a listing of WordStar User Area 1 and User Area 4. This assembly listing is complete for WordStar version 3.2. The listing contains references to CP/M[™] as well as IBM PC DOS[™]. Since you have an IBM PC DOS operating system simply disregard CP/M references. Specific information for patching WordStar for your IBM system begins with location 02D5 of User Area 1.

This listing provides a description of the modifiable areas that can be patched by the user. This listing will be useful primarily to those users with programming experience. Patches to these areas are not normally needed. The format of the listing has been edited to improve its readability.

ERIES-III 8086/8087/8088 MACRO ASSEMBLER V1.0 ASSEMBLY OF MODULE USER1
 O OBJECT MODULE REQUESTED
 NVOCATION LINE CONTROLS: PRINT(:F4:USER1.LST) NOOJ XREF PAGESWIDTH(132)

```

OC OBJ LINE SOURCE
      1 CGROUP GROUP CODE
      2 DGROUP GROUP CODE
      3 NAME USER1
      4 $TITLE('USER1: TERMINAL PATCH AREA')
      5 ASSUME CS:CODE,DS:CODE,SS:CODE,ES:CODE
----- 6 CODE SEGMENT WORD PUBLIC 'CODE'
----- 7 CODE ENDS
      8
----- 9 CODE SEGMENT PUBLIC
10
11 PUBLIC HITE,WID,CLEAD1,CLEAD2,CTRAIL,CB4LFG,LINOFF,COLOFF
12 PUBLIC ASCUR,ERAEOI,LINDEL,LININS,IVON,IVOFF
13 PUBLIC TRMINI,TRMUNI,INISUB,UNISUB,DELCUS,DELMIS
14 PUBLIC DEL1,DEL2,DEL3,DEL4,NMOFUS,TCKFLG
15 PUBLIC DEL5
16 PUBLIC IBMFLG,MSDOS ; ** IBM **
17 PUBLIC USELST,MEMAPV,MEMADR,HIBIV,HIBCUR,CRBLIV,ZAFCIN
18 PUBLIC RUBFXF,RFIXER,UCONO,UCONI,UCNSTA,SWIN,SWOUT
19 PUBLIC MORPAT,PBGMEM,RSTFLG,DEFDSK,SCRLSZ
20 PUBLIC IBMATT,UCRPOS,UCRPS1
21 EXTRN OUTCHR: NEAR
22 EXTRN MEMORY_:BYTE
23
1100 24 TBASE EQU 100H ;WHERE TO LOAD PROGRAM FOR NORMAL CP/M86
25 ;OR MSDOS
1248 26 ORG TBASE+148H ;BEGINS AT 248 HEX (MUST LOAD AFTER "FIRST")
27
28 ; *****
29 ; *
30 ; * USER-MODIFIABLE CONSTANTS AND ROUTINES FOR *
31 ; * HARDWARE-DEPENDENT TERMINAL CHARACTERISTICS *
32 ; * AND FUNCTIONS USED BY EDITOR *
33 ; *
34 ; *****
35
36 ;NOTE: THIS AREA IS NORMALLY PATCHED FOR YOUR TERMINAL
37 ;TYPE VIA THE INTERACTIVE INSTALL PROGRAM. ADDITIONAL
38 ;PATCHING TO THIS AREA IS NEEDED ONLY FOR UNUSUAL TERMINALS
39 ;OR UNUSUAL VIDEO BOARDS, OR TO MEET SPECIAL REQUIREMENTS
40 ;OR ENHANCE OR PERSONALIZE PERFORMANCE.
41
42 ;
43 ; PATCHES ALWAYS NEEDED: SCREEN HITE & WIDTH, CURSOR
44 ;(EXCEPT FOR IBM PC), & OPERATING SYSTEM
45 ;
46 ; ALL OTHERS ARE OPTIONS FOR SPECIAL CASES OR ENHANCEMENT.
47 ;
48 + $EJECT
  
```

LOC OBJ LINE SOURCE

```
49 ;
50 ; SCREEN SIZE
51 ;
52 ; SCREEN HEIGHT AND WIDTH PATCHES ARE MANDATORY.
53 ;
0248 18 54 HITE DB 24 ;MUST BE EXACT SCREEN HEIGHT IN LINES
0249 50 55 WID DB 80 ;MUST BE <= EXACT SCREEN WIDTH
56 ;
57 ;
58 ;
59 ; IN ALL CHARACTER STRINGS TO BE SENT TO TERMINAL,
60 ; FIRST BYTE IS NUMBER OF CHARACTERS, CHARACTERS FOLLOW.
61 ;
62 ;
63 ;
64 ; PROVISIONS FOR PATCHING
65 ; CURSOR POSITIONING CONTROL SEQUENCES
66 ;
67 ; CURSOR POSITIONING PATCH IS MANDATORY.
68 ; (UNLESS IBMFLG IS PATCHED 0FFH,
69 ; WHEN IT IS HANDLED AUTOMATICALLY)
70 ;
71 ; CURSOR POSITIONING FOR MOST TERMINALS
72 ; IS ACCOMPLISHED BY SENDING:
73 ;
74 ; 1. A "LEAD-IN" STRING OF ONE OR MORE
75 ; TERMINAL-SPECIFIC CHARACTERS;
76 ; 2. THE LINE NUMBER, WITH AN OFFSET (OFTEN 0)
77 ; ADDED; OR, FOR SOME TERMINALS,
78 ; THE COLUMN NUMBER IS SENT FIRST;
79 ; 3. ANOTHER LEAD-IN STRING, FOR SOME TERMINALS;
80 ; 4. THE COLUMN (OR LINE) NUMBER, WITH OFFSET;
81 ; 5. ANOTHER STRING (FOR SOME TERMINALS).
82 ;
83 ; FOR MOST TERMINALS, THE LINE AND COLUMN ARE SENT
84 ; AS 1-BYTE BINARY NUMBERS; FOR A FEW TERMINALS,
85 ; TWO- OR THREE-DIGIT ASCII NUMBERS ARE SENT.
86 ;
87 ; FOR TERMINALS THAT DON'T FIT THE ABOVE PATTERNS,
88 ; YOU MUST CODE YOUR OWN SUBROUTINE.
89 ;
90 ;CURSOR PATCH AREAS ARE ON NEXT PAGE
91 ; SEE COMMENTS PRECEDING PAGE
92 ;
93 ; FOR EXAMPLE, THE CURSOR IS POSITIONED ON THE
94 ; ADM-3A TERMINAL BY SENDING:
95 ; ESCAPE, =,
96 ; LINE # PLUS 20 HEX,
97 ; COLUMN NUMBER PLUS 20 HEX.
98 ; THE FOLLOWING PATCH AREAS ARE SET UP FOR THIS
99 ; TERMINAL, AS AN EXAMPLE.
100 ;
101 ; CURSOR POSITIONING INITIAL LEAD-IN STRING
024A 02 102 CLEAD1 DB 2 ;NUMBER OF CHARACTERS
024B 1B 103 DB 1BH ;FIRST CHARACTER
```

LOC	OBJ	LINE	SOURCE
024C	3D	104	DB '=' ;SECOND CHARACTER
024D	00	105	DB 0,0,0 ;SPACE FOR MORE
024E	00		
024F	00		
0250	00	106	DB 0,0,0 ;.. CHARACTERS
0251	00		
0252	00		
		107	
		108	; CURSOR POSITIONING STRING SENT BETWEEN
		109	; LINE AND COLUMN
0253	00	110	CLEAD2 DB 0 ;NUMBER OF CHARACTERS -
		111	; NONE IN OUR EXAMPLE
0254	00	112	DB 0 ;FIRST CHARACTER
0255	00	113	DB 0,0,0 ;SECOND THRU 4TH
0256	00		
0257	00		
		114	
		115	; CURSOR POSITIONING STRING SENT AFTER
		116	; BOTH LINE AND COLUMN HAVE BEEN SENT
0258	00	117	CTRAIL DB 0 ;NUMBER OF CHARACTERS (NONE)
0259	00	118	DB 0,0,0,0
025A	00		
025B	00		
025C	00		
		119	
		120	; FLAG NON-ZERO TO SEND COLUMN BEFORE LINE
025D	00	121	CB4LFG DB 0 ;LINE GOES BEFORE
		122	;..COLUMN IN OUR EXAMPLE
		123	
		124	; OFFSET TO ADD TO LINE
025E	20	125	LINOFF DB 20H ;ADD THIS TO LINE #
		126	; (WHERE 0 IS TOP LINE ON
		127	; SCREEN BEFORE OFFSET)
		128	
		129	; OFFSET TO ADD TO COLUMN
025F	20	130	COLOFF DB 20H ;ADD THIS TO COLUMN #
		131	; (WHERE 0 IS LEFT EDGE OF
		132	; SCREEN BEFORE OFFSET)
		133	
		134	; BINARY / ASCII FLAG AND # ASCII DIGITS
0260	00	135	ASCUR DB 0 ;ZERO TO SEND BINARY LINE & COLUMN
		136	;2 TO SEND 2-DIGIT ASCII NUMBERS
		137	;3 TO SEND 3-DIGIT ASCII NUMBERS
		138	
		139	;SEE NEXT PAGE FOR POSITIONING
		140	;CURSOR VIA USER-CODED SUBROUTINE
		141	;CURSOR POSITIONING...
		142	
0261	00	143	DB 0,0,0 ;BYTES RESERVED FOR EXPANSION
0262	00		
0263	00		
		144	;
		145	; PROVISION FOR POSITIONING CURSOR BY USER-CODED
		146	; SUBROUTINE INSTEAD OF UNDER CONTROL OF ABOVE ITEMS,
		147	; FOR USE IN EXCEPTIONAL CASES ONLY:

```

LOC  OBJ  LINE  SOURCE
      148      ;
      149      ; PUT A JMP INSTRUCTION TO YOUR SUBROUTINE IN
      150      ; FOLLOWING 3 BYTES. WHENEVER FIRST BYTE IS
      151      ; NON-0, THIS LOCATION WILL BE CALLED TO POSITION
      152      ; CURSOR; ABOVE CURSOR PATCH ITEMS WILL BE DISREGARDED.
      153      ; (WORKS FOR ALL SYSTEMS INCLUDING IBM PC)
      154
0264  155  UCRPOS LABEL NEAR
0264 00  156  UCRPS1 DB 0 ;NORMALLY 0, OR JMP TO YOUR
0265 90  157  NOP ;SPECIAL CURSOR POSITIONING
0266 C3  158  RET ;ROUTINE.
      159      ;(NOTE: ABOVE CANNOT BE A NOP,IT IS TESTED FOR ZERO/NON-ZERO.)
      160
      161
      162      ; SEE "MORPAT" AT THE END OF THIS LISTING
      163      ; FOR SPACE TO PUT YOUR SUBROUTINE IN.
      164
      165      ; YOUR SUBROUTINE WILL RECEIVE LINE IN L REGISTER
      166      ; (0=TOP SCREEN), COLUMN IN H (0=LEFT EDGE).
      167      ; YOUR SUBROUTINE MAY ALTER ALL REGISTERS.
      168      ; TO OUTPUT A CHARACTER TO THE TERMINAL FROM WITHIN
      169      ; YOUR SUBROUTINE, CALL OUTCHR. EXAMINE THE FOLLOWING
      170      ; 2 BYTES WITH YOUR DEBUGGER TO DETERMINE THE ADDRESS
      171      ; TO CALL IN CURRENT RELEASE OF WORDSTAR:
      172
0267 0000 173  DW OFFSET (OUTCHR) ;ADDRESS OF BYTE OUTPUT
      174      ;ROUTINE LOADED HERE
      175
      176      ; YOUR CUSTOM CURSOR POSITIONING ROUTINE WILL ALSO
      177      ; RECEIVE THE FOLLOWING, WHICH MIGHT BE USEFUL
      178      ; IN SPECIAL VIDEO BOARD DRIVERS:
      179      ; DE=NUMBER OF CHAR POSITIONS FROM BEGINNING OF SCREEN
      180      ; TO NEW CURSOR POSITION (0=UPPER LEFT CORNER).
      181      ; BC=NUMBER OF CHAR POSITIONS FROM BEGINNING SCREEN TO
      182      ; BEGINNING OF LINE IN WHICH CURSOR IS BEING PLACED.
      183
      184
0269 00  185  DB 0,0,0,0 ;RESERVED BYTES
026A 00
026B 00
026C 00
      186      ;
      187      ; EVERYTHING THAT FOLLOWS IS OPTIONAL.
      188      ; EACH ITEMS RELATE EITHER TO ENHANCED PERFORM-
      189      ; ANCE (FOR EXAMPLE, USE OF INVERSE VIDEO
      190      ; OR BRIGHT/DIM TO SET OFF BLOCKS OF TEXT),
      191      ; OR TO ACCOMODATING UNUSUAL TERMINALS.
      192      ;
      193      ;ERASE TO END OF LINE. OPTIONAL - IF FUNCTION
      194      ;NOT AVAILABLE, LEAVE FIRST BYTE ZERO AND EDITOR
      195      ;WILL DO THE FUNCTION MORE SLOWLY VIA SOFTWARE.
      196
026D 00  197  ERAEOL DB 0 ;PUT NUMBER OF CHARCTERS HERE
026E 00  198  DB 0 ;PUT FIRST CHARACTER HERE
026F 00  199  DB 0 ;IF 2-CHAR SEQUENCE, PUT 2ND HERE

```

LOC	OBJ	LINE	SOURCE
0270	00	200	DB 0,0,0,0 ;IF 3 TO 6 CHAR SEQUENCE,
0271	00		
0272	00		
0273	00		
		201	;PUT ADDITIONAL CHARS HERE.
		202	
		203	;DELETE SCREEN LINE CONTAINING CRSOR, MOVE
		204	;LOWER LINES ON SCREEN UP ONE LINE. OPTIONAL.
		205	;SUPPLYING THIS SPEEDS SCREEN UPDATE.
		206	
		207	
0274	00	208	LINDEL DB 0 ;PUT LENGTH HERE
0275	00	209	DB 0,0,0 ;SPACE FOR 1-6 CHARACTERS
0276	00		
0277	00		
0278	00	210	DB 0,0,0
0279	00		
027A	00		
		211	
		212	;INSERT A BLNK LINE ON SCREEN, MOVING CURSOR
		213	;LINE AND LINES BELOW IT DOWN ONE. OPTIONAL.
		214	;SUPPLYING THIS SPEEDS SCREEN UPDATE.
		215	;N. B. IF YOUR TERMINAL INSERTS BELOW THE
		216	;CURSOR LINE, PUT A "CURSOR UP" BEFORE THE
		217	;"INSERT LINE" CHARACTER(S).
		218	
		219	
027B	00	220	LININS DB 0 ;PUT LENGTH HERE
027C	00	221	DB 0,0,0,0 ;SPACE FOR 1-8 CHARACTERS
027D	00		
027E	00		
027F	00		
0280	00	222	DB 0,0,0,0
0281	00		
0282	00		
0283	00		
		223	
		224	;TURN ON HIGHLIGHTING (INVERSE VIDEO, BRIGHT/DIM, OR
		225	;OTHER MEANS OF HIGHLIGHTING A SECTION OF TEXT).
		226	;APPLICABLE ONLY IF MEMAPV (NEXT PAGE) IS 0. OPTIONAL.
		227	
		228	
		229	
0284	00	230	IVON DB 0 ;LENGTH
0285	00	231	DB 0,0,0 ;UP TO 6 CHARACTERS
0286	00		
0287	00		
0288	00	232	DB 0,0,0
0289	00		
028A	00		
		233	
		234	;TURN OFF HIGHLIGHTING. OPTIONAL.
		235	;IF NO STRING PATCHED IN, IVON STRING WILL BE
		236	;USED TO TURN OFF AS WELL AS ON.
		237	

LOC	OBJ	LINE	SOURCE
		238	
028B	00	239	IVOFF DB 0 ;LENGTH
028C	00	240	DB 0,0,0 ;UP TO 6 CHARACTERS
028D	00		
028E	00		
028F	00	241	DB 0,0,0
0290	00		
0291	00		
		242	
		243	;TERMINAL INITIALIZATION STRING: ANY BYTES YOU
		244	;WANT SENT TO YOUR TERMINAL AT BEGINNING OF
		245	;SESSION. OPTIONAL. SEE ALSO INISUB, NEXT PAGE.
0292	00	246	TRMINI DB 0 ;LENGTH
0293	00	247	DB 0,0,0,0 ;THE BYTES,
0294	00		
0295	00		
0296	00		
0297	00	248	DB 0,0,0,0 ;MAX LENGTH 8.
0298	00		
0299	00		
029A	00		
		249	
		250	;ANY BYTES YOU WANT SENT TO TERMINAL AT END OF
		251	;SESSION. OPTIONAL. SEE ALSO UNISUB
029B	00	252	TRMUNI DB 0 ;LENGTH
029C	00	253	DB 0,0,0,0 ;THE BYTES,
029D	00		
029E	00		
029F	00		
02A0	00	254	DB 0,0,0,0 ;UP TO 8.
02A1	00		
02A2	00		
02A3	00		
		255	
		256	;
		257	;USER-PATCHABLE INITIALIZATION SUBROUTINE. CALLED
		258	;JUST BEFORE TRMINI (PREVIOUS PAGE) IS SENT, THIS
		259	;SUBROUTINE MAY BE USED FOR SPECIAL CONSOLE INIT-
		260	;IALIZATION OR OTHER PURPOSES.
		261	;
02A4	90	262	INISUB: NOP ;ENTRY POINT. PUT DESIRED CODE IN
02A5	90	263	NOP ;"MORPAT" AREA (3 PAGES AHEAD IN
02A6	C3	264	RET ;THIS LISTING) AND PATCH IN A "JMP"
		265	;INSTRUCTION HERE. FOR YET MORE
		266	;SPACE, SEE "PBGMEM" ON SAME PAGE.
		267	;
		268	;USER-PATCHABLE DE-INITIALIZATION SUBROUTINE.
		269	;CALLED AT EXIT (JUST BEFORE TRMUNI IS SENT),
		270	;THIS SUBROUTINE MAY BE USED TO "UNDO" ANY SPECIAL
		271	;TERMINAL STATUS USED IN THE EDITOR.
		272	;
02A7	90	273	UNISUB: NOP ;ENTRY POINT. PUT DESIRED CODE IN
02A8	90	274	NOP ;"MORPAT" AREA (3 PAGES AHEAD IN
02A9	C3	275	RET ;THIS LISTING) AND PATCH IN A "JMP"
		276	;INSTRUCTION HERE. FOR YET MORE

```

LOC  OBJ  LINE      SOURCE
      277          ;SPACE, SEE "PBGMEM" ON SAME PAGE.
      278
      279          ;
      280          ; MISCELLANEOUS TERMINAL-RELATED ITEMS
      281          ;
      282
      283          ;FLAG TO PERMIT DISPLAY IN LAST COLUMN OF LAST LINE.
      284          ;INITIALLY DISABLED, AS MANY TERMINALS SCROLL SCREEN
      285          ; WHEN A CHARACTER IS DISPLAYED IN THIS POSITION.
      286
02AA  00  287  USELST  DB  0 ;PATCH NON-0 TO PERMIT LAST CHAR ON LAST
      288          ;LINE TO DISPLAY IF THIS WILL NOT SCROLL
      289          ;SCREEN OF YOUR TERMINAL. NORMALLY LEAVE 0
      290          ;FOR USE WITH TERMINAL, PATCH NON-0
      291          ;FOR USE WITH MEMORY-MAPPED VIDEO BOARD.
      292
      293
02AB  00  294          DB  0,0,0          ;BYTES RESERVED FOR EXPANSION
02AC  00
02AD  00
      295
      296          ;
      297          ;DELAYS EXECUTED AFTER VARIOUS TERMINAL FUNCTIONS,
      298          ;BEFORE NEXT CHAR IS SENT TO TERMINAL, TO ALLOW RESPONSE
      299          ;TIME REQUIRED BY CERTAIN TERMINALS WHEN USED AT HIGH
      300          ;BAUD RATES. PATCH LARGER IF YOU EXPERIENCE, FOR
      301          ;EXAMPLE, LOSS OF CHARACTERS AFTER CURSOR POSITIONING.
      302          ;EACH DELAY IS APPROX NUMBER OF MILLISECONDS ON
      303          ;5-MHZ 8086. DELAY IS ABOUT 40 PERCENT
      304          ;SHORTER ON 8-MHZ 8086.
      305
02AE  0A  306  DELCUS  DB  10;10+ MSEC DELAY AFTER CURSOR SET
02AF  05  307  DELMIS  DB  5 ;5+ MSEC DELAY AFTER OTHER FUNCTIONS
      308
      309          ;
      310          ; PROVISIONS FOR MEMORY-MAPPED VIDEO BOARDS THAT MEET
      311          ; THE FOLLOWING RESTRICTIONS:
      312          ;
      313          ; 1. CHARACTERS POSITIONS APPEAR AS MEMORY LOCATIONS
      314          ; AT SEQUENTIAL INCREASING ADDRESSES FROM A BASE.
      315          ; 2. HIGHLIGHTING, IF USED, IS INVOKED BY SETTING
      316          ; HIGH ORDER BIT OF CHARACTER.
      317          ; 3. BOARD MUST ALWAYS BE "MAPPED IN" TO THE ADDRESS
      318          ; SPACE, OR IT MUST BE SWITCHABLE IN AT AN ADDRESS
      319          ; ABOVE APPROX 8000 HEX AND ROUTINES MUST BE PATCHED
      320          ; IN AT "SWIN" AND "SWOUT" ON PAGE 12 OR SO BELOW.
      321          ;
      322          ; IF MEMAPV IS NON-ZERO, WORDSTAR WILL STORE DIRECTLY
      323          ; INTO YOUR VIDEO BOARD RATHER THAN DOING CONSOLE OUTPUT
      324          ; VIA CP/M. THIS IS THE BEST INSTALLATION METHOD FOR
      325          ; VIDEO BOARDS MEETING THE RESTRICTIONS.
      326          ;
      327          ; FOR INSTALLATION SUGGESTIONS FOR OTHER VIDEO BOARDS,
      328          ; SEE DISCUSSION NEAR END OF THIS LISTING OR IN MANUAL.
      329          ;

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LOC	OBJ	LINE	SOURCE
02B0	00	330	MEMAPV DB 0 ;NON-0 TO USE MEMORY-MAPPED VIDEO DISPLAY
		331	;DISPLAY BY DIRECT STORAGE METHOD.
02B1	0000	332	MEMADR DW 0 ;ADDRESS OF VIDEO SCREEN RAM, TOP LINE,
		333	;LEFTMOST COLUMN. THE REST OF THE SCREEN
		334	;MUST BE AT CONTIGUOUS ASCENDING ADDRESSES.
		335	; WHEN USING MEMAPV, CHECK THE FOLLOWING ITEMS BELOW:
		336	; HIBIV: NON-0 FOR HIGH-BIT HILITING (DETAILS BELOW)
		337	; HIBCUR: NON-0 FOR HIGH-BIT CURSOR
		338	; CRBLIV: NON-0 TO BLINK CURSOR IF ON HILIGHTED CHAR
		339	; SWIN, SWOUT: ROUTINES TO SWITCH VIDEO BOARD INTO
		340	; AND OUT OF ADDRESS SPACE, IF NEEDED
		341	; SETTING USELST ABOVE IS ALSO RECOMMENDED.
		342	;
		343	;FLAG TO SAY INVERSE VIDEO, HIGH BRIGHTNESS, OR OTHER
		344	;MEANS OF HIGHLIGHTING CHARACTER WILL OCCUR IF HIGH
		345	;ORDER BIT OF CONSOLE OUTPUT CHARACTER IS ON.
		346	; INTENDED PRIMARILY FOR USE WHEN MEMAPV IS NON-ZERO
		347	; (SEE IVON/IVOFF ABOVE FOR HILITING ON TERMINALS);
		348	; BUT MIGHT ALSO BE USEFUL WITH CUSTOM CONSOLE OUTPUT
		349	; ROUTINE (UCONO, BELOW).
		350	;
		351	;
02B3	00	352	HIBIV DB 0 ;PATCH NON-0 IF YOU HAVE INVERSE
		353	;VIDEO ETC. INVOKED BY HI ORDER BIT.
		354	;
		355	;
		356	;FLAG TO INVOKE DISPLAY OF CURSOR ON MEMORY MAPPED
		357	;VIDEO BOARD BY SETTING HIGH ORDER BIT OF CHARACTER
		358	;UNDER CURSOR, RATHER THAN BY SENDING A CURSOR POSI-
		359	;TIONING STRING UNDER CONTROL OF THE PATCH ITEMS ON
		360	;PAGES 3 AND 4.
		361	; THIS SAVES TIME AND ELIMINATES INTERACTION PROBLEMS
		362	; THAT CAN ARISE IF CHARACTER DISPLAY IS BY DIRECT
		363	; STORAGE BUT CURSOR POSITIONING IS VIA THE EXTERNAL
		364	; BOARD DRIVER.
		365	;NOTE: CURSOR POSITION PATCHES SHOULD STILL BE INSTALLED
		366	; TO INTERFACE TO EXTERNAL CURSOR POSITION FUNCTION;
		367	; IT IS USED AT STARTUP AND EXIT TO PLACE INTERNAL AND
		368	; EXTERNAL CURSORS IN SAME PLACE.
		369	;
02B4	00	370	HIBCUR DB 0 ;NON-0 TO DISPLAY CRSR BY SETTING
		371	;HIGH ORDER BIT OF CHARACTER.
		372	;APPLICABLE IF MEMAPV, ABOVE, IS NON-0.
		373	;
		374	;
		375	;FLAG TO SAY CURSOR MUST BE BLINKED BY THE EDITOR
		376	;IN ORDER TO BE VISIBLE WHEN ON OR ADJACENT TO AN
		377	;INVERSE VIDEO (OR OTHERWISE HIGHLIGHTED)
		378	;CHARACTER. THIS SHOULD BE 0FFH IF YOUR CURSOR
		379	;IS NOT VISUALLY DISTINCT FROM YOUR INVERSE VIDEO
		380	;AND INVERSE VIDEO IS USED (VIA IVON/IVOFF OR HIBIV).
		381	;NORMALLY NEEDED WITH MEMORY MAPPED VIDEO BOARDS
		382	;WITH HIBIV AND HIBCUR BOTH 0FFH.
		383	;APPLICABLE TO BOTH TERMINALS AND VIDEO BOARDS.
		384	;BLINK METHOD USED FOR A TERMINAL: ALTERNATELY

LOC	OBJ	LINE	SOURCE	
		385		;SEND IVON, IVOFF STRINGS, WITH DELAYS.
		386		;
02B5	00	387	CRBLIV DB 0	;FF HEX FOR EDITOR TO BLINK CURSOR
		388		;WHEN ON INVERSE VIDEO CHARACTER.
		389		
		390		
		391		
		392		; SEE ALSO SWIN, SWOUT -- 3 PAGES AHEAD
		393		; TWO SCHEMES FOR CIRCUMVENTING OPERATING SYSTEMS
		394		; THAT BACKSPACE WHEN "DELETE" IS INPUT.
		395		;
		396		; A NUMBER OF PROPRIETARY VERSIONS OF CP/M
		397		;OUTPUT BACKSPACE, SPACE, BACKSPACE IN PLACE OF THE
		398		;THE NEXT CHARACTER OUTPUT AFTER A "DELETE" (RUBOUT)
		399		;IS INPUT. THE CODE TO DO THIS IS IN THE "BIOS"
		400		;SECTION OF YOUR SYSTEM.
		401		; THE INTENT OF THIS "FEATURE" IS TO MAKE THE
		402		;"DELETE" KEY ERASE A CHARACTER ON THE SCREEN,
		403		;INSTEAD OF ECHOING THE DELETED CHARACTER, DURING
		404		;SYSTEM COMMAND LINE INPUT.
		405		; UNFORTUNATELY, THIS "FEATURE" CAUSES A MESS ON
		406		;THE SCREEN AFTER THE DELETE KEY IS PRESSED IN WordStar,
		407		;BECAUSE THE CHARACTER THAT YOUR SYSTEM REPLACES WITH
		408		;BACKSPACE-SPACE-BACKSPACE IS USUALLY THE FIRST
		409		;CHARACTER OF A CURSOR POSITIONING SEQUENCE BEING
		410		;OUTPUT BY WordStar.
		411		;
		412		; THE "DELETE-BACKSPACE" FEATURE THUS MUST BE DISABLED
		413		; DURING WordStar OPERATION; TWO METHODS ARE:
		414		;
		415		; 1. BY REFERRING TO YOUR "BIOS" LISTING IN YOUR
		416		; SYSTEM DOCUMENTATION, IDENTIFY THE LOCATION
		417		; IN WHICH YOUR OPERATING SYSTEM SAVES THE LAST
		418		; CHARACTER INPUT IN ORDER TO TEST FOR "DELETE"
		419		; ON OUTPUT. IN SOME SYSTEMS, THIS IS LOCATION 4F.
		420		; PATCH THIS ADDRESS, LOW ORDER BYTE FIRST, INTO
		421		; "ZAF CIN" BELOW.
		422		;
		423		; 2. PATCH "RUBFXF" BELOW TO NON-ZERO. THE CONTENTS
		424		; OF "RFXER" WILL THEN BE OUTPUT IMMEDIATELY
		425		; AFTER A "DELETE" IS INPUT; THIS CHARACTER, RATHER
		426		; THAN THE NEXT CURSOR POSITIONING STRING, SHOULD
		427		; THUS BE REPLACED WITH BACKSPACE-SPACE-BACKSPACE,
		428		; REDUCING THE CONSEQUENCES OF YOUR SYSTEM'S
		429		; MACHINATIONS. TRY NULL (ZERO) IN RFXER FIRST;
		430		; IF THIS DOESN'T WORK, TRY BACKSPACE (08) OR SPACE.
		431		;
		432		
02B6	0000	433	ZAF CIN DW 0	;ZERO OR POINTER TO LOCATION TO ZERO
		434		; AFTER EACH KEYBOARD CHARACTER IS INPUT
		435		
02B8	00	436	RUBFXF DB 0	;NON-ZERO TO OUTPUT CHARACTER IN RFXER
		437		; AFTER EACH "DELETE" IS INPUT.
02B9	00	438	RFXER DB 0	;CHARACTER TO OUTPUT AFTER EACH "DELETE"
		439		; IS INPUT IF "RUBFXF" IS NON-0.

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LOC  OBJ  LINE      SOURCE
      440          ; OPTIONAL USER-SUPPLIED CONSOLE I/O SUBROUTINES. USER MAY
      441          ; PATCH JMP'S HERE TO HIS OWN CONSOLE INPUT, OUTPUT, AND
      442          ; STATUS ROUTINES, IN WHICH CASE THESE ROUTINES INSTEAD OF
      443          ; THE OPERATING SYSTEM "BIOS" ENTRY POINTS WILL BE USED FOR
      444          ; ALL CONSOLE I/O (EXCEPT I/O TO PRINTER INSTALLED AS ALTER-
      445          ; NATE CONSOLE). THESE ROUTINES MAY ALTER ALL REGISTERS.
      446          ;
      447
      448          ; OPTIONAL USER CONSOLE CHARACTER READY ROUTINE
      449
02BA 00  450  UCNSTA DB 0 ;NORMALLY 0, OR JUMP TO YOUR OWN STATUS
02BB 90  451          NOP          ;SUBROUTINE. MUST RETURN 0 IN A
02BC C3  452          RET          ;IF NO CHAR READY, 0FFH IF CHAR IS READY.
      453
      454          ; OPTIONAL USER CONSOLE INPUT ROUTINE
      455
02BD 00  456  UCONI  DB 0 ;NORMALLY 0, OR JMP TO YOU OWN INPUT
02BE 90  457          NOP          ;SUBROUTINE. MUST RETURN CHARACTER IN A.
02BF C3  458          RET          ;MAY BE CALLED BEFORE CHARACTER IS READY.
      459          ;IF NO CHARACTER IS READY, ROUTINE MUST
      460          ; WAIT UNTIL CHARACTER IS AVAILABLE.
      461
      462          ; OPTIONAL USER CONSOLE OUTPUT ROUTINE
      463          ;USE OF A CUSTOM ROUTINE ACCESSED HERE IS SUGGESTED,
      464          ;FOR EXAMPLE, TO DRIVE A VIDEO BOARD THAT CANNOT BE
      465          ;DRIVEN VIA OUTPUT TO OPERATING SYSTEM AND WHICH DOES
      466          ;NOT MEET RESTRICTIONS FOR USE OF "MEMAPV" ABOVE.
      467
02C0    468  UCONO  LABEL  NEAR
      469
02C0 00  470          DB 0 ;NORMALLY 0, ELSE JMP TO YOUR OWN CONSOLE
02C1 90  471          NOP          ;OUTPUT SUBROUTINE. SUBROUTINE RECIEVES
02C2 C3  472          RET          ;CHARACTER IN A; IF HI-BIT HILITING IS IN
      473          ;USE ("HIBIV" SET ABOVE), HI ORDER BIT
      474          ;WILL BE ON IF CHAR SHOULD BE HILITED.
      475
      476          ;UCONO ALSO RECEIVES: L=LINE # ON SCREEN, H=COLUMN #,
      477          ; DE=# BYTES FROM BEGINNING OF SCREEN TO CHARACTER
      478          ; POSITION (0=TOP LEFT), BC=# BYTES FROM BEGINNING
      479          ; OF SCREEN TO BEGINNING OF CURRENT LINE
      480
      481          ;UCONO ROUTINE MUST HANDLE THE FOLLOWING CHARACTERS:
      482          ; ASCII PRINTING CHARACTERS 20H THRU 7EH: DISPLAY CHAR,
      483          ;ADVANCE CURSOR TO NEXT POSITION. HI ORDER BIT WILL
      484          ;BE 1 FOR HILIGHTED CHARS IF HIBIV, ABOVE, IS NZ.
      485          ; CR (0DH): POSITION CURSOR AT BEGINNING OF SAME LINE
      486          ; LF (0AH): MOVE CURSOR DOWN ONE LINE; OR, IF ALREADY
      487          ; ON BOTTOM LINE OF SCREEN, SCROLL SCREEN
      488          ; UP ONE LINE.
      489          ; PLUS ALL CONTROL SEQUENCES GENERATED BY CURSOR PATCH
      490          ; ITEMS ABOVE (UNLESS A CURSOR SUBROUTINE (UCRPOS) IS
      491          ; USED) AND OPTIONAL PATCH ITEMS ERAEOL, LINDEL, LININS,
      492          ; IVON, IVOFF, TRMINI, AND TRMUNI ABOVE.
      493          ;
      494          ; IF YOU HAVE INSTALLED FOR IBM PC, YOU MAY STILL

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LOC OBJ LINE SOURCE

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495 ; USE THE UCON ROUTINES TO OVERRIDE THE BUILT IN
496 ; STANDARD ROUTINES. IN ORDER TO USE SCREEN HIGHLIGHTING
497 ; THE BYTE AT IBMATT MUST BE MAINTAINED BY THE UCONO
498 ; ROUTINE TO BE THE CURRENT REQUIRED ATTRIBUTE. EVERY
499 ; TIME A CHARACTER IS OUTPUT FROM AL, THE CURRENT
500 ; ATTRIBUTE BYTE AT IBMATT SHOULD BE LOADED IN AH.
501 ;
502 ; IN THE CASE OF THE IBM PC, THE FIRST BYTE OF BOTH
503 ; IVON AND IVOFF SHOULD BE SET TO THE ATTRIBUTE NEEDED
504 ; AND THAT BYTE MOVED TO IBMATT TO INVOKE HIGHLIGHTING.
505
506
507 ;
508 ; PROVISIONS TO SWITCH A MEMORY MAPPED VIDEO BOARD INTO
509 ; AND OUT OF THE ADDRESS SPACE.
510 ; MOST VIDEO BOARDS ALWAYS APPEAR IN MEMORY. HOWEVER,
511 ; CERTAIN BOARDS MUST BE "SWITCHED IN" TO BE ACCESSED AND
512 ; "SWITCHED OUT" WHEN NOT BEING STORED INTO, SO THAT
513 ; SYSTEM ROM OR RAM AT THE SAME ADDRESSES MAY BE ACCESSED.
514 ; IF YOU HAVE A VIDEO BOARD THAT REQUIRES "SWITCHING
515 ; IN" AND "SWITCHING OUT", THE BOARD MAY BE ACCESSED ON A
516 ; DIRECT MEMORY MAPPED BASIS BY WORDSTAR WITHOUT LOSS OF
517 ; USE OF MEMORY AT THE SAME ADDRESSES IF SUITABLE ROUTINES
518 ; ARE INSTALLED FOR "SWIN" AND "SWOUT" BELOW.
519 ; WHEN SWITCHED IN, THE ADDRESSES OCCUPIED BY THE
520 ; BOARD MUST NOT CONFLICT WITH WORDSTAR'S CODE, THAT IS,
521 ; THE BOARD MUST APPEAR AT OR ABOVE ABOUT 8000 HEX.
522 ; THE BOARD MAY, HOWEVER, APPEAR AT THE SAME ADDRESSES
523 ; AS THE OPERATING SYSTEM.
524 ; SEE "MEMAPV" AND OTHER ITEMS BEGINNING ON PAGE 8
525 ; OR SO FOR OTHER ASPECTS OF INSTALLATION FOR DIRECT
526 ; MEMORY ACCESS TO A VIDEO BOARD.
527 ; SIX BYTES OF SPACE IS PROVIDED FOR EACH ROUTINE
528 ; BELOW. IF ROUTINE IS LONGER, PATCH IN A JMP TO A ROUTINE
529 ; AT MORPAT OR ELSEWHERE. YOUR ROUTINES MUST PRESERVE ALL
530 ; REGISTERS EXCEPT THE PSW. WHEN NO ROUTINE IS PRESENT,
531 ; "NOP, NOP, RET" SHOULD BE LEFT IN THE PATCH ITEM.
532 ; NO ROUTINES SHOULD BE INSTALLED EXCEPT WHEN A VIDEO
533 ; BOARD IS BEING USED ON A DIRECT MEMORY MAPPED BASIS.
534 ; OPTIONAL ROUTINE CALLED BY WORDSTAR BEFORE EACH
535 ; DIRECT MEMORY MAPPED ACCESS TO A VIDEO BOARD.
536 ; THIS ROUTINE MAY SWITCH THE VIDEO BOARD INTO THE
537 ; ADDRESS SPACE, POSSIBLY DISPLACING PART OF THE
538 ; SYSTEM'S RAM OR ROM ABOVE ABOUT 8000 HEX.
539 ; ROUTINE MUST PRESERVE CONTENTS OF B,C,D,E,H, AND L.
02C3 90 540 SWIN: NOP ;NORMALLY NOP, NOP, RET, OR
02C4 90 541 NOP ;SWITCH-IN ROUTINE OF 6 BYTES
02C5 C3 542 RET ;OR LESS, OR JMP TO LONGER
02C6 00 543 DB 0,0,0 ;ROUTINE.
02C7 00
02C8 00

544 ; OPTIONAL ROUTINE CALLED BY WORDSTAR AFTER EACH
545 ; DIRECT MEMORY MAPPED ACCESS TO A VIDEO BOARD.
546 ; THIS ROUTINE MAY SWITCH THE VIDEO BOARD OUT OF
547 ; THE ADDRESS SPACE, TO ALLOW SUBSEQUENT ACCESS

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LOC	OBJ	LINE	SOURCE		
		548			; TO ANY RAM OR ROM THE VIDEO BOARD DISPLACED.
		549			; ROUTINE MUST PRESERVE THE B,C,D,E,H, AND L REGISTERS.
02C9	90	550	SWOUT:	NOP	; NORMALLY NOP, NOP, RET, OR
02CA	90	551		NOP	; SWITCH-OUT ROUTINE OF 6 BYTES
02CB	C3	552		RET	; OR LESS, OR JMP TO LONGER
02CC	00	553		DB	0,0,0 ; ROUTINE.
02CD	00				
02CE	00				
		554			;
		555			; DELAYS FOR CURSOR BLINK, "NEW FILE" MESSAGE, ETC.
		556			;
		557			; THE FOLLOWING DELAYS MAY BE ALTERED TO ADJUST FOR
		558			; VARIATIONS IN CPU SPEED AND FOR INDIVIDUAL PREFERENCES
		559			; EACH OF THE FOLLOWING FOUR ITEMS MAY BE SET TO VALUES
		560			; BETWEEN 1 (MINIMUM DELAY) AND 127 (MAXIMUM DELAY).
		561			; IT IS SUGGESTED THAT YOU RETAIN THE APPROXIMATE
		562			; RELATIVE PROPORTIONS OF THE DELAYS.
		563			
02CF	01	564	DEL1	DB	1 ; CONTROLS SHORT DELAY. USES INCLUDE:
		565			; CURSOR BLINK (WHEN ON HILIGHTED CHAR AND CRBLIV
		566			; ABOVE IS NON-ZERO): "ON" PORTION OF CYCLE.
		567			; CURSOR BLINK BETWEEN "REPLACE Y/N:" IN STATUS
		568			; LINE AND FILE DISPLAY DURING REPLACE
		569			; COMMAND (^QA): TIME IN FILE DISPLAY AREA.
		570			
02D0	04	571	DEL2	DB	4 ; CONTROLS MEDIUM-SHORT DELAY. USES INCLUDE:
		572			; CURSOR BLINK (WHEN ON HILIGHTED CHAR AND CRBLIV
		573			; ABOVE IS NON-ZERO): "OFF" PORTION OF CYCLE.
		574			; CURSOR BLINK BETWEEN "REPLACE Y/N:" IN STATUS
		575			; LINE AND FILE DISPLAY DURING REPLACE
		576			; COMMAND (^QA): TIME IN STATUS LINE.
		577			
02D1	08	578	DEL3	DB	8 ; CONTROLS MEDIUM-LONG DELAY. USES INCLUDE:
		579			; TIME FROM HITTING A PREFIX KEY TIL
		580			; PREFIX MENU IS DISPLAYED.
		581			; DELAY AT A "FILE NAME?", ETC. QUESTION BEFORE
		582			; DISPLAY OF QUESTION SPECIAL CHARACTERS MENU.
		583			
02D2	10	584	DEL4	DB	16 ; CONTROLS LONG DELAY: USES INCLUDE:
		585			; TIME SIGNON REMAINS ON SCREEN.
		586			; TIME "NEW FILE" MESSAGE REMAINS ON SCREEN.
		587			; TIME "ABANDON" MESSAGE REMAINS DISPLAYED.
		588			; TIME TO WAIT FOR FULL SCREEN REFRESH DURING
		589			; HORIZONTAL SCROLLING
02D3	09	590	DEL5	DB	9 ; CONTROLS DELAY USED FOR A FULL SCREEN
		591			; REDISPLAY DURING HORIZONTAL SCROLLING. IT IS
		592			; THE AMOUNT OF TIME TO WAIT AFTER A KEYSTROKE
		593			; TO REFRESH THE SCREEN
		594			+ \$EJECT

LOC OBJ LINE SOURCE

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595 ; ITEMS FOR NON-STANDARD VERSIONS OF WORDSTAR.
596
597 ;*****
598 ;* *
599 ;* IBM PERSONAL COMPUTER *
600 ;* *
601 ;*****
02D4 00 602
603 IBMFLG DB 0 ;NORMALLY ZERO. SET TO 0FFH TO TELL WORDSTAR
604 ; TO USE THE SPECIAL CONSOLE ROUTINES, WHICH
605 ; ARE NECESSARY TO MAKE USE OF THE VIDEO
606 ; ATTRIBUTES OF ITS DISPLAY DRIVER. CHANGE
607 ; IBMATT, IVON AND IVOFF TO ALTER THE
608 ; STANDARD ATTRIBUTES OF DIM MENUS AND BRIGHT
609 ; TEXT.
610 ;
611 ; SETTING THIS FLAG TO 0FFH(TRUE) ALSO CAUSES
612 ; WORDSTAR TO IGNORE THE FOLLOWING SETTINGS
613 ; IN USER1 :
614 ; CLEAD1
615 ; CLEAD2
616 ; CTRAIL
617 ; CB4LFG
618 ; LINOFF
619 ; COLOFF
620 ; ASCUR
621 ; ERAEOL
622 ; LINDEL
623 ; LININS
624 ; TRMINI
625 ; TRMUNI
626 ;
627 ; THE SETTINGS BELOW ARE NOT COMPLETELY
628 ; IGNORED BUT ARE IRRELEVANT.
629 ;
630 ; MEMAPV
631 ; MEMADR
632 ; HIBIV
633 ; HIBCUR
634 ; CRBLIV
635 ; ZAF CIN
636 ; RUBFXF
637 ; RFIXER
638 ; SWIN
639 ; SWOUT
640 ;
641 ; IT IS ADVISABLE THEREFORE TO LEAVE
642 ; -----
643 ; THEM ALL AS DELIVERED, SINCE
644 ; -----
645 ; UNPREDICTABLE THINGS MAY OCCUR!!!!
646 ; -----
647
648 + $EJECT
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649
650 ;*****
651 ;* *
652 ;* IBM PERSONAL COMPUTER *
653 ;* (continued) *
654 ;*****
655
656 ; ALL OTHER USER DEFINABLE FEATURES
657 ; ARE USABLE WITH THE IBM PC.
658 ;
659 ; THESE ARE :
660 ;
661 ; FEATURE BEST SETTING
662 ; -----
663 ; HITE 19H(=25 LINES)
664 ; WID 50H(=80 COLUMNS)
665 ; UCRPOS AS INSTALLED
666 ; IBMATT 07H(INITIAL NORMAL
667 ; BRIGHTNESS)
668 ; (IBMATT , IVON AND
669 ; IVOFF ARE NOT A
670 ; CHARACTER COUNT WHEN
671 ; THE IBMFLG = 0FFH)
672 ; IVON 07H(BRIGHT CHARACTER)
673 ; IVOFF 0FH(DIM CHARACTER)
674 ; INISUB YOUR CHOICE
675 ; UNISUB YOUR CHOICE
676 ; USELST FFH(USE LAST POS'N)
677 ; DELCUS 00H(NO DELAY)
678 ; DELMIS 00H(NO DELAY)
679 ; UCNSTA AS INSTALLED
680 ; UCONI AS INSTALLED
681 ; UCONO AS INSTALLED
682 ; DEL1,DEL2,DEL3,
683 ; DEL4,DEL5 AS INSTALLED
684 ; NMOFUS ) MULTI-USER
685 ; TCKFLG ) OPERATING/SYSTEMS
686 ; RSTFLG ) AS YET UNTESTED
687 ; UNPREDICTABLE THINGS MAY OCCUR!
688 ; DEFDSK 01H
689 ; SCRLSIZ 14H
690 ; MORPAT YOUR CHOICE
691 ; PBGMEM YOUR CHOICE
692 ; MEMTOP AS INSTALLED
693
02D5 07 694 IBMATT DB 7 ; PLACE FOR PRESENT VIDEO ATTRIBUTE (IBM PC ONLY)
695 ; PLEASE SEE COMMENTS ABOUT USE AFTER UCONO.
696 + $EJECT

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LOC  OBJ  LINE      SOURCE
697
698                ;*****
699                ;*
700                ;*  MSDOS(PCDOS) OR CP/M-86  *
701                ;*
702                ;*****
703
02D6 00 704  MSDOS  DB  0H      ; SET TO 00H FOR CP/M=86,0FFH FOR MSDOS(PCDOS)
705
706
02D7 00 707                DB  0H      ; RESERVED FOR EXPANSION
708
709                ;*****
710                ;*
711                ;*  MULTI-USER OPERATING SYSTEMS  *
712                ;*
713                ;*****
714
715
716
02D8 01 717  NMOFUS  DB  1,1    ;THE # OF USERS ON THE SYSTEM. NORMALLY 1
02D9 01
718                ;SET TO A HIGHER VALUE IF WORDSTAR SPENDS
719                ;TOO MUCH TIME POLLING CSTAT, CAUSING THE SYSTEM
720                ;TO BECOME TOO DEPENDENT
721
02DA 00 722  TCKFLG  DB  0      ;SET TO 0FFH IF UNDER MP/M & SYSTEM CALL 141
723                ;CAN BE USED FOR A DELAY. THE VAUES OF DEL1, ETC
724                ;MAY HAVE TO BE CHANGED TO CORASPOND TO THE AMOUNT
725                ;OF TIME ALLOCATED PER TICK. THIS SAVES CPU TIME
726                ;IN A MULTIPROCESSING ENVOIRNMENT
727
02DB 00 728  RSTFLG  DB  0      ;SET TO NON-ZERO IF A DISK RESET SHOULD NEVER
729                ;BE ISSUED MANY VERSIONS OF MP/M DO NOT ALLOW
730                ;FOR DISK RESETS.THIS WILL FIX THE MP/M ERROR
731                ;THAT MAY OCCUR.
732
02DC 01 733  DEFDSK  DB  1      ;THE DEFAULT DISK DRIVE TO TEST FOR WSMGS,
734                ;WSOVLY1.OVR, ETC. IF THE NECESSARY FILE
735                ;IS NOT ON THE LOGGED ON DISK DRIVE PRESENTLY
736                ;SET TO TEST THE A:DRIVE SET 2=B: , 3=C: ETC.
737
02DD 14 738  SCRLSZ  DB  20     ; # OF SCREEN POSITIONS TO HORIZONTAL SCROLL
739                ;AT A TIME PRESENTLY SET TO 20, ADJUST IF YOU
740                ;WANT SCREEN TO SCROLL MORE OR FEWER SCREEN
741                ;POSITIONS
742 + $EJECT

```

```

743
744 ;*****
745 ;*
746 ;* DISCUSSION OF MEMORY-MAPPED VIDEO BOARD INSTALLATION *
747 ;*
748 ;*****
749
750 ;1. THE SIMPLEST INSTALLATION METHOD IS TO ACCESS THE BOARD
751 ; THROUGH THE OPERATING SYSTEM, AS THOUGH IT WERE A TER-
752 ; MINAL. THIS REQUIRES, OF COURSE, THAT CURSOR CAN BE
753 ; POSITIONED BY OUTPUTTING A CHAR SEQUENCE. ONLY THOSE
754 ; OPTIONAL FEATURES (LINE INSERT, ERASE END LINE, ETC.)
755 ; THAT CAN BE INVOKED VIA CHAR SEQUENCES MAY BE USED.
756 ;
757 ;2. MEMAPV/MEMADR (SEE PAGE 8 OR SO): FOR BOARDS THAT MEET
758 ; THE RESTRICTIONS (SEE PAGE 8), THIS METHOD IS BEST FOR
759 ; SPEED, MEMORY UTILIZATION, AND BECUASE ERASE TO END
760 ; LINE, LINE INSERT, AND LINE DELETE FUNCTIONS ARE
761 ; IMPLICITLY AVAILABLE WITH NO INSTALLATION CONSIDERATION.
762 ;
763 ;3. BOARDS THAT DO NOT MEET THE MEMAPV/MEMADR RESTRICTIONS:
764 ;
765 ; A. ACCESS AS A TERMINAL IF PRACTICABLE - ITEM 1
766 ;
767 ; B. BOARDS THAT CANNOT BE ACCESSED AS A TERMINAL (E.G.
768 ; BECUASE CURSOR POSITIONING OR SOME DESIRED OPTIONAL
769 ; FEATURE NOT ACCESSIBLE THROUGH OPERATING SYSTEM) AND
770 ; FOR WHICH MEMAPV/MEMADR CANNOT BE USED (E.G. BECAUSE
771 ; HIGHLIGHTING IS DESIRED AND IT IS NOT INVOKED BY
772 ; HIGH ORDER BIT OF CHARACTER, OR BECUASE CHARACTER
773 ; POSITIONS DO NOT APPEAR AT CONTIGUOUS INCREASING
774 ; MEMORY ADDRESSES): YOU MUST CODE YOUR OWN DRIVER.
775 ;
776 ; SUGGESTIONS FOR CODING YOUR OWN VIDEO BOARD DRIVER:
777 ;
778 ; BUILD THE DRIVER AROUND A CUSTOM CHARACTER OUTPUT
779 ;SUBROUTINE ACCESSED VIA THE "UCONO" ITEM. THIS ROUTINE
780 ;WILL RECEIVE THE ASCII CHARACTER CODES 20H-7EH (WHICH IT
781 ;MUST DISPLAY), THE CONTROL CHARACTERS CARRIAGE RETURN AND
782 ;LINE FEED, WHICH IT MUST PROPERLY INTERPRET, AND OTHER
783 ;CONTROL CHARACTERS PER YOUR PATCHES IN THE CURSOR POSI-
784 ;TIONING ITEMS AND OTHER TERMINAL ITEMS, AS USED. NOTE
785 ;THAT UCONO RECEIVES ADDITIONAL USEFUL INFO IN BCDEHL.
786 ; CURSOR POSITIONING MAY BE BY CHARACTER SEQUENCE (USE
787 ;CURSOR PATCH ITEMS AS FOR A TERMINAL, PAGE 3, AND INTER-
788 ;PRET THE CHAR SEQUENCE IN YOUR UCONO ROUTINE, OR BY
789 ;CUSTOM SUBROUTINE (UCRPOS, PAGE 4. READ COMMENTS WITH
790 ;WITH UCRPOS RE USEFUL INFO IN REGISTERS CAREFULLY!).
791 ; HIGHLIGHTING MAY BE INVOKED BY HIGH ORDER BIT ON
792 ;EACH HILITED CHARACTER (HIBIV) OR BY CHAR SEQUENCES
793 ;(IVON AND IVOFF, AND INTERPRET THE CHARS IN UCONO).
794 ; ERASE END LINE, LINE DELETE, AND LINE INSERT, IF IMP-
795 ;LEMENTED, MUST BE INVOKED BY CHAR SEQUENCES PATCHED INTO
796 ;ERAEOL, LINDEL, AND LININS AND INTERPRETED IN UCONO.
797 ; INITIALIZATION MAY BE DONE VIA TRMINI OR INISUB.

```

LOC	OBJ	LINE	SOURCE
02DE	00	798	DB 0,0 ;SPACE RESERVED FOR EXPANSION
02DF	00		
		799	;
		800	; SPACE FOR USER-ADDED SUBROUTINES
		801	;
02E0	00	802	MORPAT DB 0,0,0,0
02E1	00		
02E2	00		
02E3	00		
02E4	00	803	DB 0,0,0,0 ;ADDITIONAL SPACE THAT MAY
02E5	00		
02E6	00		
02E7	00		
02E8	00	804	DB 0,0,0,0 ;BE USED FOR USER PATCHES,
02E9	00		
02EA	00		
02EB	00		
02EC	00	805	DB 0,0,0,0 ;FOR EXAMPLE FOR A CURSOR
02ED	00		
02EE	00		
02EF	00		
02F0	00	806	DB 0,0,0,0 ;POSITIONING SUBROUTINE, OR
02F1	00		
02F2	00		
02F3	00		
02F4	00	807	DB 0,0,0,0 ;FOR "INISUB" OR "UNISUB"
02F5	00		
02F6	00		
02F7	00		
02F8	00	808	DB 0,0,0,0 ;SUBROUTINES.
02F9	00		
02FA	00		
02FB	00		
02FC	00	809	DB 0,0,0,0 ;FOR YET MORE SPACE,
02FD	00		
02FE	00		
02FF	00		
0300	00	810	DB 0,0,0,0 ;SPACE, SEE "PBGMEM", NEXT.
0301	00		
0302	00		
0303	00		
0304	00	811	DB 0,0,0,0
0305	00		
0306	00		
0307	00		
0308	00	812	DB 0,0,0,0
0309	00		
030A	00		
030B	00		
030C	00	813	DB 0,0,0,0
030D	00		
030E	00		
030F	00		
0310	00	814	DB 0,0,0,0
0311	00		

LOC	OBJ	LINE	SOURCE
0312	00		
0313	00		
0314	00	815	DB 0,0,0,0
0315	00		
0316	00		
0317	00		
0318	00	816	DB 0,0,0,0
0319	00		
031A	00		
031B	00		
031C	00	817	DB 0,0,0,0
031D	00		
031E	00		
031F	00		
0320	00	818	DB 0,0,0,0
0321	00		
0322	00		
0323	00		
0324	00	819	DB 0,0,0,0
0325	00		
0326	00		
0327	00		
0328	00	820	DB 0,0,0,0
0329	00		
032A	00		
032B	00		
032C	00	821	DB 0,0,0,0
032D	00		
032E	00		
032F	00		
0330	00	822	DB 0,0,0,0
0331	00		
0332	00		
0333	00		
0334	00	823	DB 0,0,0,0
0335	00		
0336	00		
0337	00		
0338	00	824	DB 0,0,0,0
0339	00		
033A	00		
033B	00		
033C	00	825	DB 0,0,0,0
033D	00		
033E	00		
033F	00		
0340	00	826	DB 0,0,0,0
0341	00		
0342	00		
0343	00		
0344	00	827	DB 0,0,0,0
0345	00		
0346	00		
0347	00		
0348	00	828	DB 0,0,0,0

LOC OBJ LINE SOURCE

```
0349 00
034A 00
034B 00
034C 00      829      DB  0,0,0,0
034D 00
034E 00
034F 00
0350 00      830      DB  0,0,0,0
0351 00
0352 00
0353 00
0354 00      831      DB  0,0,0,0
0355 00
0356 00
0357 00
0358 00      832      DB  0,0,0,0
0359 00
035A 00
035B 00

      833      ;
      834      ; PROVISION FOR EXTENDED PATCHING
      835      ;
      836      ;PBGMEM POINTS TO BEGINNING OF MEMORY TO USE FOR WORK-
      837      ;ING STORAGE. IF YET MORE SPACE IS NEEDED FOR PATCHES,
      838      ;INSTALL FIRST, THEN PUT YOUR ADDED CODE WHERE PBGMEM
      839      ;POINTS AND INCREASE PBGMEM TO POINT BEYOND YOUR PATCHES
      840      ;BE SURE TO USE A LARGE ENOUGH "SAVE" COMMAND!
      841      ; — SAVE SIZE REQUIRED IS much LARGER THAN FOR WS.COM
      842      ;WITHOUT ADDED PATCHES!
      843
035C 0000 844      PBGMEM  DW      OFFSET(MEMORY_) ;An indefinite amount of code may
      845      ;be added here AFTER INSTALLation.
      846      ;Do not add code before INSTALLing,
      847      ;as INSTALL will delete it!
      848
035E EFFF 849      MEMTOP  DW      0FFFEFH ;WORDSTAR INITIALIZATION COMPUTES
      850      ;LAST AVAILABLE RAM ADDRESS FROM
      851      ;BASE PAGE LC0/LC1 VALUES. THESE
      852      ;VALUES DEPEND ON GENCMD MINIMUM
      853      ;('M') OPTION. USE 'MFFF' TO GET
      854      ;MAXIMUM POSSIBLE RAM (0FFFEFH)
      855
      856      ; ** END TERMINAL MODIFICATION AREA **
      857
      858
      859
—      860      CODE      ENDS
      861      END
```

NAME	TYPE	VALUE	ATTRIBUTES, XREFS
??SEG .	SEGMENT		SIZE=0000H PARA PUBLIC
ASCUR .	V BYTE	0260H	CODE PUBLIC 12 135#
CB4LFG.	V BYTE	025DH	CODE PUBLIC 11 121#
CGROUP.	GROUP		CODE 1#
CLEAD1.	V BYTE	024AH	CODE PUBLIC 11 102#
CLEAD2.	V BYTE	0253H	CODE PUBLIC 11 110#
CODE. .	SEGMENT		SIZE=0360H WORD PUBLIC 'CODE' 1# 2 5 5 5 5 6 7 9 860
COLOFF.	V BYTE	025FH	CODE PUBLIC 11 130#
CRBLIV.	V BYTE	02B5H	CODE PUBLIC 17 387#
CTRAIL.	V BYTE	0258H	CODE PUBLIC 11 117#
DEFDSK.	V BYTE	02DCH	CODE PUBLIC 19 733#
DEL1. .	V BYTE	02CFH	CODE PUBLIC 14 564#
DEL2. .	V BYTE	02D0H	CODE PUBLIC 14 571#
DEL3. .	V BYTE	02D1H	CODE PUBLIC 14 578#
DEL4. .	V BYTE	02D2H	CODE PUBLIC 14 584#
DEL5. .	V BYTE	02D3H	CODE PUBLIC 15 590#
DELCJS.	V BYTE	02AEH	CODE PUBLIC 13 306#
DELMIS.	V BYTE	02AFH	CODE PUBLIC 13 307#
DGROUP.	GROUP		CODE 2#
ERAEOI.	V BYTE	026DH	CODE PUBLIC 12 197#
HIBCUR.	V BYTE	02B4H	CODE PUBLIC 17 370#
HIBIV .	V BYTE	02B3H	CODE PUBLIC 17 352#
HITE. .	V BYTE	0248H	CODE PUBLIC 11 54#
IBMATT.	V BYTE	02D5H	CODE PUBLIC 20 694#
IBMFLG.	V BYTE	02D4H	CODE PUBLIC 16 603#
INISUB.	L NEAR	02A4H	CODE PUBLIC 13 262#
IVOFF .	V BYTE	028BH	CODE PUBLIC 12 239#
IVON. .	V BYTE	0284H	CODE PUBLIC 12 230#
LINDEL.	V BYTE	0274H	CODE PUBLIC 12 208#
LININS.	V BYTE	027BH	CODE PUBLIC 12 220#
LINOFF.	V BYTE	025EH	CODE PUBLIC 11 125#
MEMADR.	V WORD	02B1H	CODE PUBLIC 17 332#
MEMAPV.	V BYTE	02B0H	CODE PUBLIC 17 330#
MEMORY_	V BYTE	0000H	EXTRN 22# 844
MEMTOP.	V WORD	035EH	CODE 849#
MORPAT.	V BYTE	02E0H	CODE PUBLIC 19 802#
MSDOS .	V BYTE	02D6H	CODE PUBLIC 16 704#
NMOFUS.	V BYTE	02D8H	CODE PUBLIC 14 717#
OUTCHR.	L NEAR	0000H	EXTRN 21# 173
PBGMEM.	V WORD	035CH	CODE PUBLIC 19 844#
RFIXER.	V BYTE	02B9H	CODE PUBLIC 18 438#
RSTFLG.	V BYTE	02DBH	CODE PUBLIC 19 728#
RUBFXF.	V BYTE	02B8H	CODE PUBLIC 18 436#
SCRLSZ.	V BYTE	02DDH	CODE PUBLIC 19 738#
SWIN. .	L NEAR	02C3H	CODE PUBLIC 18 540#
SWOUT .	L NEAR	02C9H	CODE PUBLIC 18 550#
TBASE .	NUMBER	0100H	24# 26
TCKFLG.	V BYTE	02DAH	CODE PUBLIC 14 722#
TRMINI.	V BYTE	0292H	CODE PUBLIC 13 246#
TRMUNI.	V BYTE	029BH	CODE PUBLIC 13 252#
UCNSTA.	V BYTE	02BAH	CODE PUBLIC 18 450#
UCONI .	V BYTE	02BDH	CODE PUBLIC 18 456#

LOC OBJ LINE SOURCE

UCONO .	L NEAR	02C0H	CODE PUBLIC	18	468#
UCRPOS.	L NEAR	0264H	CODE PUBLIC	20	155#
UCRPS1.	V BYTE	0264H	CODE PUBLIC	20	156#
UNISUB.	L NEAR	02A7H	CODE PUBLIC	13	273#
USELST.	V BYTE	02AAH	CODE PUBLIC	17	287#
WID . .	V BYTE	0249H	CODE PUBLIC	11	55#
ZAF CIN.	V WORD	02B6H	CODE PUBLIC	17	433#

ASSEMBLY COMPLETE, NO ERRORS FOUND



SERIES-III 8086/8087/8088 MACRO ASSEMBLER V1.0 ASSEMBLY OF MODULE USER4
 NO OBJECT MODULE REQUESTED
 INVOCATION LINE CONTROLS: PRINT(:F4:USER4.LST) NOOJ XREF PAGewidth(132)

LOC OBJ LINE SOURCE

```

1 NAME USER4
2 CGROUP GROUP CODE
3 DGROUP GROUP CODE
4 $TITLE('USER4: PRINTER PATCH AREA')
5 ASSUME CS:CODE,DS:CODE,SS:CODE,ES:CODE
--- 6 CODE SEGMENT WORD PUBLIC 'CODE'
--- 7 CODE ENDS
--- 8
9 CODE SEGMENT PUBLIC
10 ; 8086/8088 WORDSTAR Release 3.20
11
12
13 ;
14 ;ITEMS IN THIS FILE ARE NORMALLY SET AS REQUIRED BY THE
15 ;INSTALL PROGRAM, OR USED WITHOUT CHANGE.
16 ;
17 ;
18 ;THERE IS NORMALLY NO NEED TO REFER TO THIS LISTING IN
19 ;ORDER TO MAKE WORDSTAR OPERATIONAL, AS THE INSTALL
20 ;PROGRAM WILL SET ESSENTIAL ITEMS AS REQUIRED
21 ;FOR ALL NORMAL INSTALLATIONS.
22 ;
23 ;MODIFICATIONS SOME USERS MAY WISH TO MAKE IN ITEMS
24 ;LISTED HERE INCLUDE:
25 ;
26 ; 1. ADDING CONTROL SEQUENCES FOR A TELETYPE-LIKE (NON-
27 ; DAISY) PRINTER TO SUPPORT ADDITIONAL FEATURES, E.G.:
28 ; CHARACTER PITCH CHANGE
29 ; RIBBON COLOR CHANGE
30 ; PARTIAL LINE MOTION (FOR SUBSCRIPTS).
31 ;
32 ; 2. MODIFYING OR ADDING TO THE DRIVER CODE USED TO
33 ; SEND CHARACTERS TO AND FROM THE PRINTER, FOR THE
34 ; FOLLOWING OR OTHER REASONS, IN CASES WHERE
35 ; WORDSTAR'S PORT DRIVER (WHICH CAN BE FULLY SET UP
36 ; BY ANSWERING INSTALL'S QUESTIONS) CANNOT BE USED.
37 ; A) ALLOW RECEIVING CHARACTERS FROM PRINTER,
38 ; FOR PRINTERS WHICH REQUIRE ETX/ACK
39 ; PROTOCOL TO OPERATE AT MAXIMUM BAUD RATE;
40 ; B) ALLOW WORDSTAR TO DETERMINE IF PRINTER IS
41 ; READY TO RECEIVE A CHARACTER, FOR BETTER
42 ; PERFORMANCE IN CONCURRENT PRINTING;
43 ; C) INSTALLING A CUSTOM DRIVER FOR PRINTER NOT
44 ; SUPPORTED BY USER'S OPERATING SYSTEM NOR
45 ; SUPPORTABLE WITH WORDSTAR'S PORT DRIVER.
46 ;
47 ;
48 ; ENTRIES
49

```

LOC OBJ LINE SOURCE

```
50 ;*****
51
52 PUBLIC POSMTH,BLDSTR,DBLSTR,PSCRLF,PSCR,PSHALF,PBACKS
53 PUBLIC PALT,PSTD,ROLUP,ROLDOW,RIBBON,RIBOFF
54 PUBLIC USR1,USR2,USR3,USR4
55 PUBLIC PSINIT,PSFINI,SOCHR,ULCHR
56 PUBLIC PRINIT,PRFINI,CSWTCH,HAVBSY
57 PUBLIC LIBSY,LISEND,LISINP,POBSY,POSEND,POINP
58 PUBLIC POSTAT,POMASK,POM,POOP,POINSK,POIM,PISTAT,POIP
59 PUBLIC PUBSY,PUSEND,PUINP
60 PUBLIC ACBSY,ACSEND,ACINP
61 PUBLIC ACFIN,ACSTAL,ACSTAR,CONFIE
62 PUBLIC PROTCL,EAKBSZ
63
64 ;*****
65
66 EXTRN COUCH: NEAR
67 EXTRN CONSTA: NEAR
68 EXTRN INCHR: NEAR
69
70 ;*****
71
72 ; EQUATES
73
0100 74 TBASE EQU 100H ;WHERE PROGRAM IS LOADED FOR NORMAL CP/M
0746 75 ORG TBASE+646H ;BEGINS AFTER END OF USER3
76
77
78 ;IOBYTE EQU TBASE-100H+3;LOCATION OF SYSTEM I/O
79 ;ASSIGNMENTS STATUS BYTE, USED BY
80 ;ALTERNATE CONSOLE PRINTER DRIVER.
81
00E0 82 BDOS_INTERRUPT EQU 224;CP/M-86 BDOS CALL INTERRUPT
83 ;USED IN CP/M LIST DEVICE PRINTER DRIVER.
84
0005 85 LISTF EQU 5 ;CP/M LIST OUTPUT SYSTEM CALL FUNCTION #,
86 ;USED BY CP/M LIST DEVICE PRINTER DRIVER.
0007 87 GETIOB EQU 7 ;GET IOBYTE BDOS FUNCTION CODE
0008 88 SETIOB EQU 8 ;SET IOBYTE BDOS FUNCTION CODE
89
0008 90 BS EQU 8 ;BACKSPACE CHARACTER
000A 91 LF EQU 10 ;LINE FEED
000C 92 FF EQU 12 ;FORM FEED
000D 93 CR EQU 13 ;CARRIAGE RETURN
007F 94 DEL EQU 7FH ;DELETE OR RUBOUT
95 ;ITEMS RELATING TO ALL PRINTERS
96 ;
97 ; PRINTER CHARACTERISTICS AND PRINTING METHOD
98 ;
99 ;PRINTER TYPE / OVERSTRIKE METHOD **** VERY
100 ; IMPORTANT: DETERMINES METHOD OF DOUBLE
101 ; STRIKE, UNDERLINE, ETC, AND WHETHER DAISY-
102 ; LIKE PRINTER CAPABLE OF MICROSPACE JUSTIFY.
103
104 ;POSMTH=FF HEX:
```

LOC OBJ LINE SOURCE

```
105 ; PRINTER CAN OVERPRINT ONLY BY CARRIAGE
106 ; RETURN WITHOUT LINE FEED.
107 ; POSMTH=0:
108 ; PRINTER CAN OVERPRINT BY BACKSPACING AS
109 ; WELL AS BY CARRIAGE RETURNING.
110 ; NOTE: WITH POSMTH=0, CR-OVERPRINT IS USED
111 ; ONLY FOR OVERPRINT LINES IN FILE. FOR
112 ; PRINTERS THAT CAN BACKSPACE BUT NOT RETURN
113 ; CARRIAGE WITHOUT LINE FEED (EG SELECTRIC),
114 ; USE POSMTH=0 AND DON'T USE OVERPRINT LINES.
115 ; POSMTH=1:
116 ; PRINTER IS A DAISY WHEEL OR SIMILAR INCRE-
117 ; MENTAL PRINTER. CAN PRINT WITHOUT SPACING;
118 ; CAN SPACE AND ROLL IN SMALL INCREMENTS.
119 ; MICROJUSTIFICATION OCCURS ONLY IF POSMTH=1.
120 ; ADDITIONAL PATCH ITEMS IN USER5.MAC ARE SET
121 ; BY THE INSTALL PROGRAM FOR DAISIES.
122
0746 01 123 POSMTH DB 1
124 ; FF SEND CR THEN ANOTHER WHOLE LINE
125 ; 00 SEND BACKSPACE THEN CHAR TO
126 ; PRINT OVER LAST CHAR SENT
127 ; 01 DAISY WHEEL PRINTER WITH ALL NECESS
128 ; ITEMS IN USER4 AND USER5 INSTALLED.
129
0747 02 131 BLDSTR DB 2 ;NUMBER OF STRIKES FOR "BOLDFACE"
132 ;SET 3, 4, 5, ETC FOR DARKER "BOLDFACE"
133 ;ON NON-DAISY PRINTER. FOR DAISY
134 ;PRINTERS, 2 IS USED - DON'T CHANGE.
135
0748 02 136 DBLSTR DB 2 ;NUMBER OF STRIKES FOR "DOUBLE
137 ;STRIKE". INCREASE AS DESIRED.
138
0749 00 139 DB 0,0,0 ;RESERVED
074A 00
074B 00
140
141 ; ***** USER-PATCHABLE FUNCTION
142 ; STRINGS FOR NON-DAISY PRINTERS *****
143
144 ;EACH STRING CONSISTS OF THE NUMBER OF BYTES,
145 ;FOLLOWED BY THE BYTES TO BE SENT.
146 ;IF FUNCTION IS NOT AVAILABLE,
147 ;NUMBER OF BYTES SHOULD BE ZERO.
148
149 ; ITEMS ON NEXT N PAGES APPLY ONLY WHEN
150 ; POSMTH (ABOVE) IS 0 OR FF, NOT 1.
151
152 ;
153 ;STRING TO ADVANCE TO NEXT LINE, USED WHEN
154 ;CR,LF ENCOUNTERED IN FILE.
155 ;
156 ; IF YOUR PRINTER REQUIRES NULLS SENT
157 ; AFTER CARRIAGE RETURN (FOR DELAY),
```

LOC OBJ LINE SOURCE

```

158 ; INCREASE COUNT SO SOME OF
159 ; FOLLOWING ZEROES ARE SENT.
160 ;
161 ; IF YOUR PRINTER AUTO LINE-FEEDS AFTER
162 ; CR CODE, REMOVE LF. (IF POSSIBLE,
163 ; TURN OFF AUTO-LF IN YOUR PRINTER
164 ; INSTEAD, FOR GREATER FLEXIBILY OF
165 ; WORDSTAR USE).
166 ;
074C 02 167 PSCRLF DB 2 ;NUMBER OF CHARACTERS
074D 0D 168 DB CR ;1ST CHAR: CARR RET
074E 0A 169 DB LF ;2ND CHAR: LINE FEED
074F 00 170 DB 0,0,0,0 ;SPACE FOR 8
0750 00
0751 00
0752 00
0753 00 171 DB 0,0,0,0 ;..MORE CHARS
0754 00
0755 00
0756 00
172 ;
173 ;STRING TO RETURN CARRIAGE TO BEGINNING
174 ;OF SAME LINE, TO OVERPRINT.
175 ;
176 ;USED FOR UNDERLINE, DOUBLE STRIKE, ETC IF
177 ; POSMTH (ABOVE) IS FF.
178 ;AND WHEN CR WITHOUT LF IS ENCOUNTERED
179 ; IN FILE IF POSMTH IS FF OR 0.
180 ;ALSO USED WHEN POSMTH IS FF AND BACKSPACE
181 ; (^H) IS ENCOUNTERED IN FILE.
182 ;
0757 02 183 PSCR DB 2 ;2 CHARS: CR AND A NULL,
184 ;TO ALLOW A LITTLE TIME
185 ;FOR CERTAIN PRINTERS.
0758 0D 186 DB CR ;CARRIAGE RETURN
0759 00 187 INTERS
0758 0D 188 DB CR ;CARRIAGE RETURN
0759 00 189 ;SPACE FOR 4
075B 00
075C 00
075D 00
189 ;MORE CHARS.
190 ;NON-DAISY STRINGS...
191 ;
192 ; STRING TO DO CARRIAGE RETURN AND HALF LINE
193 ; FEED, FOR PRINTERS THAT CAN DO HALF LINE FEED
194 ; DOWNWARD BUT NOT UPWARD. USED TO PRINT
195 ; SUBSCRIPTS AND SUPERSSCRIPTS AT HALF-LINE
196 ; INTERVALS IF ROLUP (BELOW) NOT INSTALLED
197 ; AND POSMTH IS FF OR 0.
198 ;
199 ; FOR EXAMPLE, FOR A SELECTRIC THAT ALWAYS
200 US4 LSTq+,-/0123456789:USER5 LST5;<=>ABCDEF USER6 LST MEMORY H86
202;
075E 00 203 PSHALF DB 0

```

LOC	OBJ	LINE	SOURCE	
075F	00	204	DB	0,0,0,0,0,0
0760	00			
0761	00			
0762	00			
0763	00			
0764	00			
		205		;
		206		;STRING TO BACKSPACE, IE TO OVERPRINT LAST
		207		;CHAR PRINTED.
		208		;
		209		;USED FOR UNDERLINE, DOUBLE STRIKE, ETC IF
		210		;POSMTH (ABOVE) IS 0. ALSO USED WHEN BACKSPACE
		211		;(^H) ENCOUNTERED IN FILE IF POSMTH IS 0.
		212		;
0765	01	213	PBACKS DB	1
0766	08	214	DB	BS ;ASCII BACKSPACE
0767	00	215	DB	0,0,0,0
0768	00			
0769	00			
076A	00			
		216		
		217		
		218		; **** THE FOLLOWING ARE OPTIONAL
		219		; STRINGS, PERMITTING USE OF ADDITIONAL
		220		; FEATURES IF SUPPORTED BY YOUR PRINTER.
		221		;
		222		;STRING TO SET ALTERNATE CHARACTER
		223		;WIDTH, IF AVAILABLE.
		224		;
076B	00	225	PALT DB	0 ;0 CHARS: NOT AVAILABLE
076C	00	226	DB	0,0,0,0
076D	00			
076E	00			
076F	00			
		227		;
		228		;STRING TO RESET TO STANDARD CHARACTER WIDTH
		229		;
0770	00	230	PSTD DB	0,0,0,0,0
0771	00			
0772	00			
0773	00			
0774	00			
		231		;
		232		;STRING TO ROLL CARRIAGE UP A PARTIAL LINE
		233		; WITHOUT ALTERING CARRIAGE COLUMN,
		234		; IF AVAILABLE, FOR USE BEFORE SUPERSCRIP
		235		; AND AFTER SUBSCRIPT. ROLDOW SHOULD ALSO
		236		; BE INSTALLED TO ROLL CARRIAGE SAME AMOUNT
		237		; IN OTHER DIRECTION. APPLIES IF POSMTH=FF OR 0.
		238		;
0775	00	239	ROLUP DB	0,0,0,0,0
0776	00			
0777	00			
0778	00			
0779	00			

LOC	OBJ	LINE	SOURCE	
		240		;
		241		;STRING TO ROLL DOWN, AS AFTER SUPERScript,
		242		; IF AVAILABLE. USED ONLY IF ROLUP ALSO
		243		; INSTALLED.
		244		;
077A	00	245	ROLDOW DB	0,0,0,0,0
077B	00			
077C	00			
077D	00			
077E	00			
		246		
		247		; ***** USER-PATCHABLE ITEMS FOR BOTH
		248		; BOTH DAISY AND NON-DAISY PRINTERS *****
		249		;
		250		; STRINGS FOR USER-DEFINED FUNCTIONS 1-4, INVOKABLE
		251		; WITH PRINT CONTROL CHARACTERS IMBEDDED IN FILE.
		252		; USE ONLY WITH EXTREME CAUTION AND VERY THOROUGH
		253		; TESTING ON DAISY PRINTERS, AS WORDSTAR'S CONTROL
		254		; SEQUENCES AND YOURS COULD EASILY INTERFERE.
		255		; LINES CONTAINING CONTROLS THAT INVOKE THESE
		256		; ALWAYS PRINT FORWARD EVEN IF BIDIRECTION PRINT IS ON.
		257		;
077F	00	258	USR1 DB	0
0780	00	259	DB	0,0,0,0
0781	00			
0782	00			
0783	00			
0784	00	260	USR2 DB	0
0785	00	261	DB	0,0,0,0
0786	00			
0787	00			
0788	00			
0789	00	262	USR3 DB	0
078A	00	263	DB	0,0,0,0
078B	00			
078C	00			
078D	00			
078E	00	264	USR4 DB	0
078F	00	265	DB	0,0,0,0
0790	00			
0791	00			
0792	00			
		266		;DAISY / NON-DAISY ITEMS...
		267		
		268		;STRINGS USED BY BOTH DIASIES AND NON-DAISIES.
		269		;AUTOMATICALLY PATCHED FOR DAISIES BY INSTALL PROGRAM;
		270		;MEDDLE WITH CAUTION FOR DAISY PRINTERS.
		271		;
		272		; CHANGE RIBBON COLOR (OPTIONAL)
		273		;
0793	00	274	RIBBON DB	0 ;CHANGE TO ALTERNATE COLOR
0794	00	275	DB	0,0,0,0
0795	00			
0796	00			
0797	00			

LOC	OBJ	LINE	SOURCE			
		276				
0798	00	277	RIBOFF	DB	0	;CHANGE BACK TO BLACK
0799	00	278		DB	0,0,0,0	
079A	00					
079B	00					
079C	00					
		279				;
		280				; STRING TO INITIALIZE PRINTER. SENT AT
		281				; START OF PRINTING, MAY BE USED TO TURN MOTOR
		282				; ON, SET STANDARD CHARACTER SIZE AND LINE
		283				; HEIGHT, OR OTHER FUNCTIONS FOR YOUR SPECIFIC
		284				; HARDWARE. ALWAYS PATCHED BY INSTALL PROGRAM,
		285				; ADD YOUR BYTES AFTER INSTALLATION.
		286				;
079D	01	287	PSINIT	DB	1	;NUMBER OF CHARACTERS
079E	0D	288		DB	CR	;CARRIAGE RETURN, TO MAKE SURE
		289				;CARRIAGE STARTS AT LEFT EDGE
		290				;OF PAPER.
079F	00	291		DB	0,0,0	
07A0	00					
07A1	00					
07A2	00	292		DB	0,0,0,0	;UP TO 16 CHARACTERS ..
07A3	00					
07A4	00					
07A5	00					
07A6	00	293		DB	0,0,0,0	;.. TOTAL TO SEND ..
07A7	00					
07A8	00					
07A9	00					
07AA	00	294		DB	0,0,0,0	;.. TO PRINTER
07AB	00					
07AC	00					
07AD	00					
		295				;
		296				; STRING SENT TO PRINTER AT CONCLUSION OF
		297				; PRINTING, EG TO TURN MOTOR OFF.
		298				;
07AE	00	299	PSFINI	DB	0	
07AF	00	300		DB	0,0,0,0	
07B0	00					
07B1	00					
07B2	00					
07B3	00	301		DB	0,0,0,0	
07B4	00					
07B5	00					
07B6	00					
07B7	00	302		DB	0,0,0,0	
07B8	00					
07B9	00					
07BA	00					
07BB	00	303		DB	0,0,0,0	;UP TO 16 CHARS
07BC	00					
07BD	00					
07BE	00					
		304				

LOC	OBJ	LINE	SOURCE	
07BF 00		305	DB	0,0 ;RESERVED
07C0 00		306		
		307		;
		308		; CHARACTER USED FOR "STRIKEOUT" PRINT ENHANCEMENT
		309		; (INVOKED WITH CONTROL-X PRINT CONTROL)
07C1 2D		310	SOCHR DB	'_'
		311		;
		312		; CHARACTER USED FOR "UNDERSCORE" PRINT ENHANCEMENT
		313		; (INVOKED WITH CONTROL-S PRINT CONTROL)
07C2 5F		314	ULCHR DB	'_'
		315		;
		316		; CUSTOM PRINTER INITIALIZE SUBR, CALLED BEFORE
		317		; STRING (PSINIT OR DINIT) IS SENT. USE FOR
		318		; ANYTHING THAT CAN'T BE ACCOMPLISHED WITH
		319		; A STRING, SUCH AS ASSIGNMENT OR INITIALIZING
		320		; A SPECIAL DRIVER INSTALLED IN YOUR BIOS.
		321		;
07C3 90		322	PRINIT: NOP	;INITIALLY NULL. PATCH A JMP
07C4 90		323	NOP	;TO YOUR ROUTINE HERE. SEE END
07C5 C3		324	RET	;OF USER1.MAC RE FINDING PATCH
		325		;SPACE.
		326		;
		327		; CUSTOM PRINTER FINISH (CLOSE) SUBR, CALLED
		328		; AFTER STRING (PSFINI OR DFINI) IS SENT.
		329		;
07C6 90		330	PRFINI: NOP	
07C7 90		331	NOP	
07C8 C3		332	RET	
		333		
		334		
		335		; ***** FLAGS RELATING TO TRANSMISSION
		336		; OF CHARACTERS TO PRINTER *****
		337		
		338		;ITEMS ON THIS PAGE RELATE TO ALL PRINTERS.
		339		
07C9 00		340	CSWICH DB	0 ;WHERE TO SEND EACH OUTPUT CHARACTER:
		341		; 00 TO CP/M LIST DEVICE.
		342		; HAVBSY SHOULD BE 0 (UNLESS YOU
		343		; INSTALL A "BUSY" ROUTINE AT LIBSY)
		344		; 01 TO INSTALL-PROGRAM-PATCHABLE PORT DRIVER
		345		; 02 TO USER SUBROUTINE, ENTRY POINTS
		346		; PUBUSY, PUSEND, AND PUINP.
		347		; 03 TO OEM DAISY PRINTER DRIVER.
		348		; FORCES POSMTH=1.
		349		; 04 TO ALTERNATE CONSOLE PRINTER DRIVER.
		350		
07CA 00		351	HAVBSY DB	0 ; NON-ZERO IF PRINTER DRIVER
		352		; AS INSTALLED AND PATCHED
		353		; HAS A "BUSY" TEST SEPARATE FROM
		354		; "PRINT A CHARACTER". IF NON-ZERO,
		355		; CONCURRENT EDITING AND PRINTING
		356		; WILL PERFORM BETTER; MUST BE ZERO
		357		; IF CAN'T FIND OUT WHETHER PRINTER
		358		; IS BUSY (AS WHEN CHARACTERS ARE

LOC OBJ LINE SOURCE

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359 ; OUTPUT THROUGH CP/M "LIST" DEVICE).
360
07CB 00 361 DB 0 ;RESERVED FOR EXPANSION
362
363
364 ; THERE ARE FIVE DRIVERS, CORRESPONDING TO
365 ; CSWTC (PREVIOUS PAGE) = 00, 01, 02, 03, 04.
366 ;
367 ; EACH OF THE DRIVERS HAS THREE ENTRIES:
368 ; 1. BUSY STATUS ENTRY. RETURNS CY=1 IF
369 ; PRINTER IS NOT READY. IF UNIMPLEMENTED,
370 ; RETURN CY=0. HAVBSY SHOULD BE 0 IF
371 ; UNIMPLEMENTED AND FF IF IMPLEMENTED.
372 ; 2. SEND CHARACTER (A REGISTER) ENTRY.
373 ; 3. INPUT A CHAR TO A, OR RETURN CY=1 IF NO
374 ; INPUT CHARACTER READY. THIS ENTRY IS
375 ; USED ONLY FOR ETX/ACK AND XON/XOFF
376 ; BUFFER FULL PROTOCOLS IMPLEMENTED
377 ; WITHIN EDITOR (SEE "PROTCL" BELOW).
378 ;
379 ; THESE ROUTINES MAY CLOBBER ALL REGISTERS.
380
381 ;
382 ;PRINTER DRIVER TO OUTPUT TO CP/M LIST
383 ;DEVICE. ONLY CALLED IF CSWITCH=00.
384 ;
385
07CC 386 LIBSY: ;BUSY TEST ENTRY - BUSY TEST MAY BE
387 ;ADDED HERE IF YOUR OPERATING SYSTEM
388 ;ALLOWS DETERMINING WHETHER PRINTER
389 ;IS READY. PATCH HAVBSY TO FF IF USED.
390 ;
391 ; TO USE THE ROUTINES PROVIDED BELOW
392 ; FOR THE IBM PC, NOP OUT THE INDICATED
393 ; INSTRUCTIONS.(REPLACE EACH BYTE WITH
394 ; A HEXADECIMAL 90).
07CC 90 395 NOP
07CD F8 396 CLC ;RETURN CY=0 TO SAY ** FOR IBM MAKE NOP **
07CE C3 397 RET ; .. NOT BUSY. ** FOR IBM MAKE NOP **
398
07CF 399 IBMBUSY:
07CF BA000 400 MOV DX,0 ; Set up printer int.
07D2 B402 401 MOV AH,2 ; Read printer status
07D4 CD17 402 INT 17H ; Printer interrupt
07D6 80E4ANo - rurn
07DB F9 405 STC ; Set carry to show it
07DC 406 IBMBUSY2:
07DC C3 407 RET
408
07DD 409 LISEND: ;OUTPUT CHARACTER (A) TO LIST DEVICE
410 ;
411 ; TO USE THE ROUTINES PROVIDED BELOW
412 ; FOR THE IBM PC, NOP OUT THE INDICATED
413 ; INSTRUCTIONS.(REPLACE EACH BYTE WITH
414 ; A HEXADECIMAL 90).
```

LOC	OBJ	LINE	SOURCE
		415	
07DD	8AD0	416	MOV DL,AL ;CHARACTER IN DL FOR CP/M** NOP FOR IBM **
07DF	B105	417	MOV CL,LISTF ;FUNCTION # IN CL ** NOP FOR IBM **
07E1	CDE0	418	INT BDOS_INTERRUPT ;CALL CP/M-86 BDOS ** NOP FOR IBM **
07E3	F8	419	CLC ;CLEAR CY FLAG ** NOP FOR IBM **
07E4	C3	420	RET ;RETURN TO CALLER ** NOP FOR IBM **
		421	
07E5		422	IBMSEND:
07E5	BA000	423	MOV DX,0 ; Printer number
07E8	B400	424	MOV AH,0 ; Means print a char.
07EA	CD17	425	INT 17H ; Send the char.
07EC	C3	426	RET
		427	
07ED		428	LISINP: ;INPUT CHARACTER TO (A) OR RETURN CY=1
		429	;IF NONE. THIS FUNCTION IS NOT SUPPLIED
		430	;BY OPERATING SYSTEM, USER MUST SUPPLY
		431	;SUBROUTINE IF ETX/ACK OR XON/XOFF
		432	;PROTOCOL IS TO BE USED.
		433	
07ED	90	434	NOP
07EE	F9	435	STC ;IF NO ROUTINE INSTALLED, SAY
07EF	C3	436	RET ; .. NO CHARACTER READY.
		437	;
		438	;PORT DRIVER. CALLED ONLY IF CSWITCH=1.
		439	;
		440	; DOES I/O DIRECT TO HARDWARE PORTS. PORT NUMBERS AND
		441	;STATUS BITS MAY BE SET AS DESIRED BY ANSWERING QUESTIONS
		442	;ASKED BY THE INSTALL PROGRAM AFTER CHOOSING "PORT DRIVER".
		443	; INITIALLY SET UP TO USE PORT 4 FOR DATA, PORT 5 BIT 0
		444	;ON TO INDICATE READY FOR OUTPUT, PORT 5 BIT 1 ON TO
		445	;INDICATE INPUT CHARACTER READY.
		446	; SELECTING PORT DRIVER IN INSTALL SETS HAVBSY TO FF.
		447	;
07F0		448	POBSY LABEL BYTE ;PORT DRIVER STATUS ENTRY
		449	;BUSY TEST CODE:
		450	
07F0	E4	451	DB 0E4H ;"IN AL,5" INSTRUCTION
07F1	05	452	POSTAT DB 5 ;PATCH OUTPUT STATUS PORT # HERE
07F2	90	453	NOP ; - PORT 5 SHOWN AS EXAMPLE
		454	
		455	;MASK BIT(S) OF INTEREST -)
07F3	24	456	DB 24H ;"AND AL,1" INSTRUCTION
07F4	01	457	POMASK DB 1 ; BIT 0 SHOWN AS EXAMPLE.
		458	
		459	;COMPLEMENT BITS WHICH MUST)
07F5	34	460	DB 34H ;"XOR AL,1" INSTRUCTION
07F6	01	461	POOM DB 1 ; BE 1 FOR PRINTER READY.
		462	;NOW HAVE NON-ZERO IF PRINTER NOT RDY
07F7	F9	463	STC ;SAY NOT READY
07F8	7401	464	JZ SHORT L_1
07FA	C3	465	RET
07FB		466	L_1: ;RETURN IF NOT READY
07FB	F8	467	CLC ;CLEAR CARRY: SAY READY
07FC	C3	468	RET ;RETURN
		469	

LOC	OBJ	LINE	SOURCE	BYTE	COMMENT
07FD		470	POSEND LABEL		;PORT DRIVER SEND CHAR ENTRY
		471			
07FD	E6	472	DB	0E6H	;"OUT 4,AL" INSTRUCTION
07FE	04	473	POOP DB	4	;OUTPUT DATA PORT PATCHED HERE -
07FF	90	474	NOP		; PORT 4 SHOWN AS EXAMPLE.
0800	C3	475	RET		
		476			
0801		477	POINP LABEL	BYTE	;PORT DRIVER INPUT CHAR ENTRY,
		478			;USED IF PROTCL=1 OR 2 ONLY.
		479			
0801	E4	480	DB	0E4H	;"IN AL,5" INSTRUCTION
0802	05	481	PISTAT DB	5	;PATCH INPUT STATUS PORT # HERE
0803	90	482	NOP		
		483			
0804	24	484	DB	24H	;"AND AL,2" INSTRUCTION
0805	02	485	POINSK DB	2	;MASK BITS OF INTEREST - B1 SHOWN
		486			
		487			;COMPLEMENT BITS THAT ARE ON WHEN)
0806	34	488	DB	34H	;"XOR AL,2" INSTRUCTION
0807	02	489	POIM DB	2	; INPUT CHARACTER IS READY
		490			;NOW HAVE NZ IF INPUT CHARACTER NOT READY
0808	F9	491	STC		
0809	7401	492	JZ	SHORT L_2	
080B	C3	493	RET		
080C		494	L_2:		;RETURN CY=1 IF NO CHAR READY
		495			;CHARACTER IS READY, INPUT IT
		496			
080C	E4	497	DB	0E4H	;"IN AL,4" INSTRUCTION
080D	04	498	POIP DB	4	;PATCH INPUT DATA PORT # HERE
080E	90	499	NOP		
080F	F8	500	CLC		;CLEAR CY
0810	C3	501	RET		;RETURN WITH CHAR IN A
		502			
		503		DB 0,0,0,0,0,0,0	;RESERVED
		504			
		505			;USER-SUPPLYABLE PRINTER OUTPUT SUBROUTINES
		506			;CALLED ONLY IF CSWITCH=2.
		507			
		508			; THIS MAY BE USED WHERE SPECIAL INTERFACE
		509			; REQUIREMENTS NECESSITATE A MORE COMPLEX
		510			; ROUTINE THAN THE PORT DRIVER ABOVE.
		511			
		512			; SPACE IS PROVIDED HERE ONLY FOR THE JMPS TO
		513			; THE ROUTINES; PATCH OVER DRIVERS ABOVE, OR
		514			; IN "MORPAT" AREA AT END OF USER1 MODULE
		515			; (SEE PRECEDING LISTING). FOR MORE SPACE,
		516			; SEE "PBG MEN" AND ASSOCIATED COMMENTS AT
		517			; END OF USER1 LISTING.
		518			
0811	90	519	FUBSY: NOP		;ENTRY POINT TO USER-SUPPLIED
		520			; ROUTINE TO RETURN CY=1 IF
		521			; PRINTER IS NOT READY.
0812	F8	522	CLC		;IF UNIMPLEMENTED, RET CY=0.
0813	C3	523	RET		
		524			

LOC	OBJ	LINE	SOURCE
0814	90	525	PUSEND: NOP ;ENTRY POINT TO USER-SUPPLIED
0815	90	526	NOP ; ROUTINE TO PRINT CHARACTER
0816	C3	527	RET ; IN A REGISTER.
		528	
0817	90	529	PUINP: NOP ;ENTRY POINT TO USER-SUPPLIED
		530	; ROUTINE TO INPUT CHARACTER,
		531	; OR RETURN CY=1 IF NONE READY.
		532	; USED ONLY IF PROTCL IS 1 OR 2.
0818	F9	533	STC ;IF UNIMPLEMENTED, SAY NO CHAR RDY.
0819	C3	534	RET
		535	
		536	
		537	
		538	; THE PRINTER DRIVER FOR CSWICH=3 IS NOT IN USER4.
		539	
		540	; DB 0,0,0 ;RESERVED
		541	;PRINTER DRIVERS...
		542	
		543	; "ALTERNATE CONSOLE" PRINTER DRIVER
		544	; CALLED ONLY IF CSWICH=4.
		545	
		546	; THIS DRIVER ALLOWS ACCESS TO PRINTERS REQUIRING
		547	; CHARACTER INPUT (FOR A COMMUNICATIONS PROTOCOL)
		548	; WITHOUT PATCHING IN A DRIVER, UNDER OPERATING
		549	; SYSTEMS WHICH SUPPORT MULTIPLE CONSOLES SELECTED
		550	; VIA THE "IOBYTE" I/O ASSIGNMENTS BYTE.
		551	
		552	; THIS DRIVER IS SELECTED BY SETTING CSWICH TO 4.
		553	
		554	; THE SPECIFIC CONSOLE DEVICE TO BE USED IS SELECTED
		555	; BY SETTING ITEM "CONFIE" BELOW TO 00, 01, 02, OR 03.
		556	
		557	; "HAVBSY" SHOULD BE 0 WHEN USING ALTERNATE CONSOLE
		558	; DRIVER, UNLESS YOU ADD A BUSY TEST ROUTINE.
		559	
		560	
081A		561	ACBSY: ;ENTRY POINT FOR OUPUT BUSY TEST.
		562	;NO ROUTINE SUPPLIED, AS NORMAL OPERATING SYSTEM
			; DOES NOT PROVIDE CONSOLE OUTPUT BUSY FUNCTION.
		563	; TO USE THE ROUTINES PROVIDED BELOW
		564	; FOR THE IBM PC, NOP OUT THE INDICATED
		565	; INSTRUCTIONS.(REPLACE EACH BYTE WITH
		566	; A HEXADECIMAL 90).
		567	
081A	90	568	NOP ;
081B	F8	569	CLC ;RETURN CY=0 TO SAY "NOT BUSY" ** NOP FOR IBM **
081C	C3	570	RET ; ** NOP FOR IBM **
		571	
081D		572	IBMACBUSY:
081D	BA000	573	MOV DX,0 ; First RS232 card
0820	B403	574	MOV AH,3 ; Code for status
0822	CD14	575	INT 14H ; RS232 I/O
0824	F6C42	576	TEST AH,20H ; Busy ?
0827	7402	577	JZ IBMACBUSY2 ; Yes - go set it
0829	F8	578	CLC ; Not busy

LOC	OBJ	LINE	SOURCE
082A	C3	579	RET
		580	
082B		581	IBMACBUSY2:
082B	F9	582	STC ; Indicate busy
082C	C3	583	RET ;
		584	
		585	
		586	
082D		587	ACSEND: ;ENTRY POINT TO SEND CHARACTER IN A TO PRINTER
		588	;SET IOBYTE TO ALTERNATE CONSOLE,
		589	;SAVING ORIGINAL IOBYTE IN B.
		590	;
		591	; TO USE THE ROUTINES PROVIDED BELOW
		592	; FOR THE IBM PC, NOP OUT THE INDICATED
		593	; INSTRUCTIONS.(REPLACE EACH BYTE WITH
		594	; A HEXADECIMAL 90).
082D	E8000	595	CALL NEAR PTR(COUCH) ;OUTPUT CHARACTER (A) TO CONSOLE,
		596	;PRESERVING REGISTERS. ** NOP FOR IBM **
0830	EB15	597	JMP SHORT ACFIN;GO RESTORE IOBYTE AND RETURN. ** NOP FOR IBM **
0832		598	IBMACSEND:
0832	BA000	599	MOV DX,0 ; First RS232 card
0835	B401	600	MOV AH,1 ; Code for send char.
0837	CD14	601	INT 14H ; RS232 I/O
0839	C3	602	RET ;
		603	
		604	
083A		605	ACINP: ;ENTRY POINT TO RETURN CONSOLE INPUT CHARACTER
		606	;IN A REGISTER, OR RETURN CY=1 IF NO CHAR READY.
		607	; TO USE THE ROUTINES PROVIDED BELOW
		608	; FOR THE IBM PC, PATCH A JUMP TO
		609	; "IBMACINP" IN THE POSITION MARKED.
		610	
		611	
		612	
083A	E81B0	613	CALL ACSTAR ;SAVE AND SET IOBYTE ** PATCH JMP **
		614	; ** TO IBMACINP HERE **
083D	E8000	615	CALL NEAR PTR(CONSTA);THIS SUBROUTINE RETURNS 0 IN
		616	;A AND Z FLAG SET IF NO CHARACTER
		617	;IS READY AT CONSOLE. SAVES BCDEHL.
0840	7403	618	JZ SHORT L_3
0842	E8000	619	CALL NEAR PTR(INCHR)
0845		620	L_3: ;IF CHARACTER READY, GET IT TO A.
		621	;ELSE 0 IS LEFT IN A.
0845	8AF0	622	MOV DH,AL ;PUT VALUE TO RETURN IN D FOR NOW
		623	;FALL THRU TO ACFIN ON NEXT PAGE TO RESTORE IOBYTE,
		624	;RETURN D IN A, CY=1 IF NO CHAR READY, ELSE CY=0.
		625	
		626	
0847		627	ACFIN: ;ALTERNATE CONSOLE DRIVER COMMON EXIT ROUTINE
		628	
0847	8AC5	629	MOV AL,CH ;ORIGINAL IOBYTE, SAVED BY "ACSTAR"
0849		630	ACSTAL: ;"ACSTAR" SUBROUTINE JOINS HERE
		631	
		632	;SET NEW IOBYTE OR RESTORE ORIGINAL

LOC	OBJ	LINE	SOURCE
0849	8AD0	633	MOV DL,AL
084B	B108	634	MOV CL,SETIOB
084D	CDE0	635	INT BDOS_INTERRUPT ;SET IOBYTE THROUGH BDOS
		636	
084F	8AC6	637	MOV AL,DH ;RESTORE A REGISTER
		638	;RETURN CY=1 IF A=0: THIS IS NEEDED AT EXIT FROM
		639	;"ACINP" ROUTINE, DOES NO HARM IN OTHER CASES.
0851	0AC0	640	OR AL,AL ;TEST FOR NON-ZERO, CLEAR CY FLAG
0853	7401	641	JZ SHORT L_4
0855	C3	642	RET
0856		643	L_4: ;IF NON-ZERO, RETURN CY FLAG CLEAR
0856	F9	644	STC ;ELSE SET CARRY FLAG
0857	C3	645	RET ;FOR A=0 RETURN CY=1
		646	
		647	
0858		648	ACSTAR: ;COMMON ENTRY SUBR FOR ALTERNATE CONSOLE DRIVER
		649	
0858	8AF0	650	MOV DH,AL ;SAVE A IN D, FOR ACSEND.
		651	
		652	;GET I/O ASSIGNMENTS STATUS BYTE
085A	B107	653	MOV CL,GETIOB
085C	CDE0	654	INT BDOS_INTERRUPT ;GET IOBYTE THROUGH BDOS
		655	
085E	8AE8	656	MOV CH,AL ;SAVE INITIAL IOBYTE IN B
0860	24FC	657	AND AL,0FCH;ZERO THE "CONSOLE" PART OF IOBYTE
		658	
		659	;SET DESIRED CONSOLE BITS
0862	0C	660	DB 0CH ;"OR AL,1 INSTRUCTION
0863	01	661	CONFIE DB 01 ;USER OR INSTALLATION SETS DESIRED
		662	;CONSOLE BITS HERE:
		663	; 00 = TTY: PHYSICAL DEVICE
		664	; 01 = CRT: PHYSICAL DEVICE
		665	; 02 = BAT: PHYSICAL DEVICE
		666	; 03 = UCI: PHYSICAL DEVICE
		667	; NEW IOBYTE VALUE IS NOW IN A
0864	EBE3	668	JMP ACSTAR ;GO SET IOBYTE FROM A, RESTORE A
		669	;FROM D, AND RETURN TO CALLER.
		670	
0866	00	671	DB 0,0,0 ;RESERVED
0867	00		
0868	00		
		672	
0869		673	IBMACINP:
0869	E8B1F	674	CALL IBMACBUSY ; Busy ?
086C	F6C40	675	TEST AH,1
086F	F9	676	STC ; Return carry set
0870	7501	677	JNZ IBMACINP2 ; OK to get a char.
0872	C3	678	RET ; Otherwise return
0873		679	IBMACINP2:
0873	B402	680	MOV AH,2 ; Code to receive char.
0875	CD14	681	INT 14H ; RS232 I/O
0877	F8	682	CLC ; Clean up carry
0878	C3	683	RET ;
		684	
		685	

LOC OBJ LINE SOURCE

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686 ; **** PRINTER COMMUNICATIONS PROTOCOL ****
687 ;
688 ; APPLICABLE IF CSWTC=0, 1, OR 2.
689 ; APPLICABLE FOR ALL POSMTH VALUES.
690 ;
691 ; THREE BUFFER FULL PROTOCOLS ARE SUPPORTED:
692 ;
693 ; NO PROTOCOL: (PROTCL=0): NO PROTOCOL EXECUTED IN WORD-
694 ; STAR: USE IF NONE REQUIRED OR IF HANDLED ELSEWHERE,
695 ; EG IN OPERATING SYSTEM OR IN USER DRIVER ROUTINES.
696 ;
697 ; ETX/ACK PROTOCOL (PROTCL=1): WS TRANSMITS "ETX" AT END
698 ; OF STRING OF CHARACTERS, PRINTER RESPONDS WITH
699 ; "ACK" WHEN ALL OF THESE CHARACTERS HAVE BEEN
700 ; PRINTED. DRIVER MUST BE ABLE TO INPUT CHARACTERS.
701 ;
702 ; XON/XOFF PROTOCOL (PROTCL=2): PRINTER
703 ; SENDS "XOFF" WHEN WS SHOULD STOP SENDING,
704 ; "XON" WHEN TRANSMISSION SHOULD BE RESUMED.
705 ; DRIVER MUST BE ABLE TO INPUT CHARACTERS.
706 ;
0879 00 707 PROTCL DB 0 ;0=NO PRINTER BUFFER FULL PROTOCOL
708 ;1=ETX/ACK PROTOCOL. SET EAKBSZ BELOW!
709 ;2=XON/XOFF PROTOCOL
710 ; USE 0 FOR MOST TTY-LIKE PRINTERS AND FOR SERIAL
711 ; DAISY PRINTERS INTERFACED AT 300 BAUD OR SLOWER.
712 ; FOR DIABLO AND QUME AT 1200 BAUD, USE 1.
713 ; FOR NEC AT 1200 BAUD, USE 1 OR 2 AND CONFIGURE THE
714 ; PRINTER APPROPRIATELY, OR USE 0 & CABLE ADAPTER.
715
087A 7F 716 EAKBSZ DB 127 ;ETX/ACK MESSAGE LENGTH (1/2 PRINTER'S
717 ;BUFFER SIZE), APPLICABLE ONLY IF PROTCL=1,
718 ;AUTOMATICALLY PATCHED FOR DAISY PRINTER.
719
720
721 CODE ENDS
722 END

```

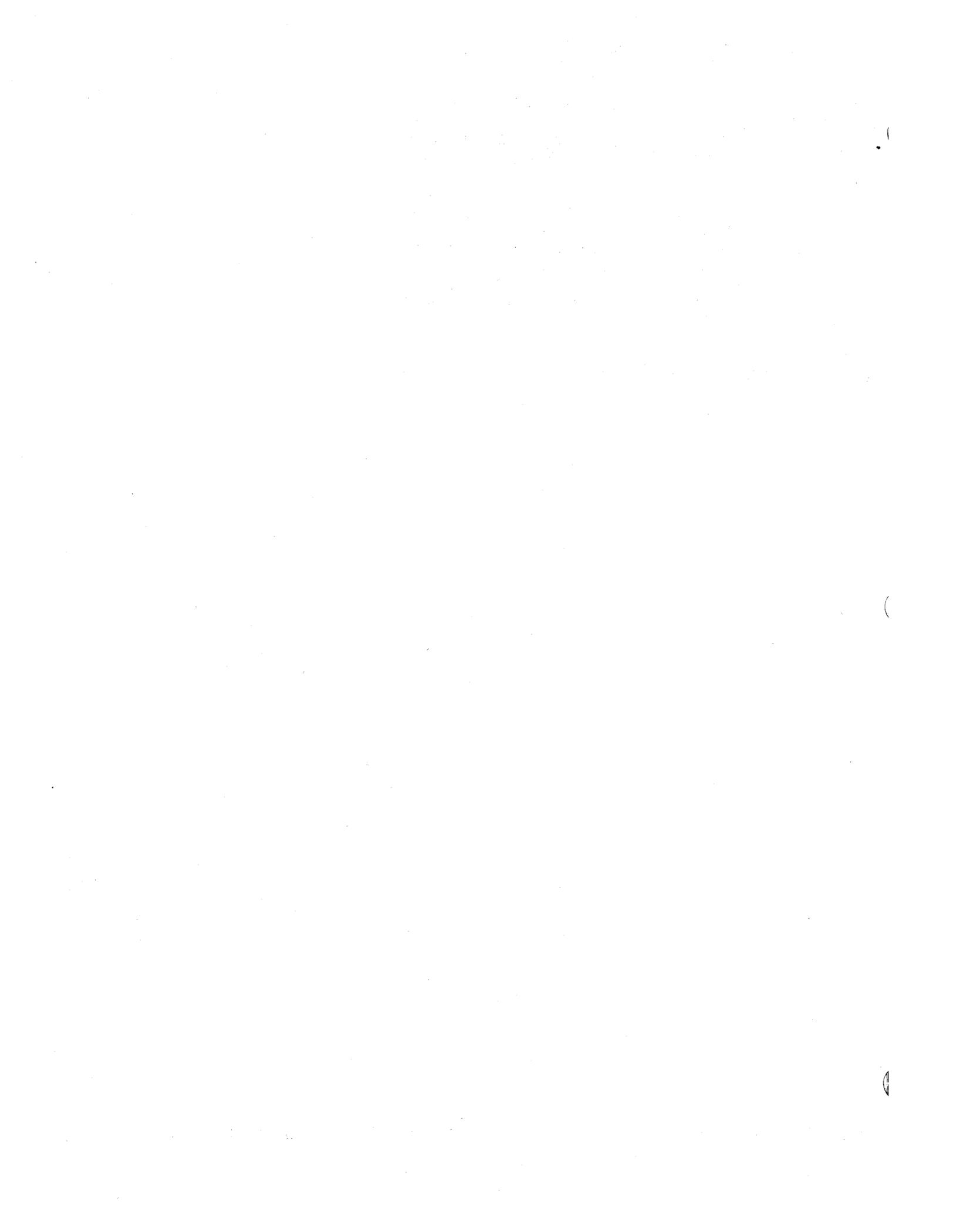
XREF SYMBOL TABLE LISTING

NAME	TYPE	VALUE	ATTRIBUTES, XREFS
??SEG	SEGMENT		SIZE=0000H PARA PUBLIC
ACBSY	L NEAR	081AH	CODE PUBLIC 60 561#
ACFIN	L NEAR	0847H	CODE PUBLIC 61 597 627#
ACINP	L NEAR	083AH	CODE PUBLIC 60 605#
ACSEND.	L NEAR	082DH	CODE PUBLIC 60 587#
ACSTAL.	L NEAR	0849H	CODE PUBLIC 61 630# 668
ACSTAR.	L NEAR	0858H	CODE PUBLIC 61 613 648#
BDOS_INTERRUPT.	NUMBER	00E0H	82# 418 635 654
BLDSTR.	V BYTE	0747H	CODE PUBLIC 52 131#
BS.	NUMBER	0008H	90# 214
CGROUP.	GROUP		CODE 2#
CODE.	SEGMENT		SIZE=087BH WORD PUBLIC 'CODE' 2# 3 5 5 5 5 6 7 9 721

NAME	TYPE	VALUE	ATTRIBUTES, XREFS
CONFIE.	V BYTE	0863H	CODE PUBLIC 61 661#
CONSTA.	L NEAR	0000H	EXTRN 67# 615
COUCH	L NEAR	0000H	EXTRN 66# 595
CR.	NUMBER	000DH	93# 168 186 288
CSWTCH.	V BYTE	07C9H	CODE PUBLIC 56 340#
DBLSTR.	V BYTE	0748H	CODE PUBLIC 52 136#
DEL	NUMBER	007FH	94#
DGROUP.	GROUP		CODE 3#
EAKBSZ.	V BYTE	087AH	CODE PUBLIC 62 716#
FF.	NUMBER	000CH	92#
GETIOB.	NUMBER	0007H	87# 653
HAVBSY.	V BYTE	07CAH	CODE PUBLIC 56 351#
IBMACBUSY	L NEAR	081DH	CODE 572# 674
IBMACBUSY2.	L NEAR	082BH	CODE 577 581#
IBMACINP.	L NEAR	0869H	CODE 673#
IBMACINP2	L NEAR	0873H	CODE 677 679#
IBMACSEND	L NEAR	0832H	CODE 598#
IBMBUSY	L NEAR	07CFH	CODE 399#
IBMBUSY2.	L NEAR	07DCH	CODE 404 406#
IBMSEND	L NEAR	07E5H	CODE 422#
INCHR	L NEAR	0000H	EXTRN 68# 619
L_1	L NEAR	07FBH	CODE 464 466#
L_2	L NEAR	080CH	CODE 492 494#
L_3	L NEAR	0845H	CODE 618 620#
L_4	L NEAR	0856H	CODE 641 643#
LF.	NUMBER	000AH	91# 169
LIBSY	L NEAR	07CCH	CODE PUBLIC 57 386#
LISEND.	L NEAR	07DDH	CODE PUBLIC 57 409#
LISINP.	L NEAR	07EDH	CODE PUBLIC 57 428#
LISTF	NUMBER	0005H	85# 417
PALT.	V BYTE	076BH	CODE PUBLIC 53 225#
PBACKS.	V BYTE	0765H	CODE PUBLIC 52 213#
PISTAT.	V BYTE	0802H	CODE PUBLIC 58 481#
POBSY	V BYTE	07F0H	CODE PUBLIC 57 448#
POIM.	V BYTE	0807H	CODE PUBLIC 58 489#
POINP	V BYTE	0801H	CODE PUBLIC 57 477#
POINSK.	V BYTE	0805H	CODE PUBLIC 58 485#
POIP.	V BYTE	080DH	CODE PUBLIC 58 498#
POMASK.	V BYTE	07F4H	CODE PUBLIC 58 457#
POOM.	V BYTE	07F6H	CODE PUBLIC 58 461#
POOP.	V BYTE	07FEH	CODE PUBLIC 58 473#
POSEND.	V BYTE	07FDH	CODE PUBLIC 57 470#
POSMTH.	V BYTE	0746H	CODE PUBLIC 52 123#
POSTAT.	V BYTE	07F1H	CODE PUBLIC 58 452#
PRFINI.	L NEAR	07C6H	CODE PUBLIC 56 330#
PRINIT.	L NEAR	07C3H	CODE PUBLIC 56 322#
PROTCL.	V BYTE	0879H	CODE PUBLIC 62 707#
PSCR.	V BYTE	0757H	CODE PUBLIC 52 183#
PSCRFL.	V BYTE	074CH	CODE PUBLIC 52 167#
PSFINI.	V BYTE	07AEH	CODE PUBLIC 55 299#
PSHALF.	V BYTE	075EH	CODE PUBLIC 52 203#
PSINIT.	V BYTE	079DH	CODE PUBLIC 55 287#
PSTD.	V BYTE	0770H	CODE PUBLIC 53 230#
PUSY	L NEAR	0811H	CODE PUBLIC 59 519#
PUINP	L NEAR	0817H	CODE PUBLIC 59 529#

NAME	TYPE	VALUE	ATTRIBUTES,	XREFS
PUSEND.	L NEAR	0814H	CODE PUBLIC	59 525#
RIBBON.	V BYTE	0793H	CODE PUBLIC	53 274#
RIBOFF.	V BYTE	0798H	CODE PUBLIC	53 277#
ROLDOW.	V BYTE	077AH	CODE PUBLIC	53 245#
ROLUP	V BYTE	0775H	CODE PUBLIC	53 239#
SETIOB.	NUMBER	0008H	88# 634	
SOCHR	V BYTE	07C1H	CODE PUBLIC	55 310#
TBASE	NUMBER	0100H	74# 75	
ULCHR	V BYTE	07C2H	CODE PUBLIC	55 314#
USR1.	V BYTE	077FH	CODE PUBLIC	54 258#
USR2.	V BYTE	0784H	CODE PUBLIC	54 260#
USR3.	V BYTE	0789H	CODE PUBLIC	54 262#
USR4.	V BYTE	078EH	CODE PUBLIC	54 264#

ASSEMBLY COMPLETE, NO ERRORS FOUND



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Dear MicroPro Customer:

Congratulations on choosing WordStar®, the one word-processing software product that matches IBM's® excellence. For professional word processing, WordStar and the IBM Personal Computer make the perfect combination.

For your convenience this version of WordStar, WordStar 3.2, operates with the later version of the IBM operating system, IBM PC-DOS 1.1, as well as IBM PC-DOS 1.0.

In addition, WordStar 3.2 operates with a variety of letter-quality and dot-matrix printers. For instructions on installing your printer, please consult the "Printer Installation for the IBM Personal Computer" in your User's Guide.

When you return your signed End User Agreement Card, we'll send you two WordStar user aids for the IBM Personal Computer: a set of adhesive-backed keytop labels that identify the WordStar functions of the IBM Personal Computer's keyboard and a WordStar Menu Map, which clearly shows the relative position of each command within WordStar.

*WMA
JULY 8, 93*

Once you've used WordStar, you'll probably want to experience the same kind of power and versatility in other MicroPro software for the IBM Personal Computer:

NOW AVAILABLE:

- MailMerge™** (WordStar option): personalized form letters and other file-merging uses
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COMING:

- DataStar™**: data entry and retrieval
- CalcStar™**: electronic spread sheet and financial planning tool
- SuperSort™**: sorting, selecting and merging

Yours truly,

A handwritten signature in black ink that reads "Bruce Bastl". The signature is written in a cursive, flowing style.

Bruce Bastl
Vice President
Domestic Marketing

IBM is a registered trademark of International Business Machines Corp.

TO WORDSTAR® USERS

Attached are a series of additions and changes to "WordStar for the IBM® Personal Computer-Version 3.2." Please make the following changes to your manual:

1. The first addition is entitled "WordStar for the IBM PC." This addition (7 pages) should be positioned in your General Information Manual directly following the goldenrod colored sheet.
2. Directly following this addition (1. above), add the section entitled "Printer Installation for the IBM PC."
3. Turn to the section entitled "General Information." Replace the existing Title Page and Copyright Notice Page with the revision pages.
4. Turn to the section entitled "Reference Manual." Replace the existing Title Page and Copyright Notice Page with the revision pages.
5. Turn to page 8 of the Reference Manual "Table of Contents" section. Remove this page and replace with the revised "Table of Contents" page.
6. Directly following the "Error Message Section" of the Reference Manual, add Appendix C. (This contains a list of User Area 1 and User Area 4.)
7. Replace the "Index" section of the Reference Manual with the revised "Index."

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