

MicroPro International Corporation

WORDSTAR

GENERAL INFORMATION MANUAL
WORDSTAR
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Version 3.0

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This document was initially typed, corrected, and edited using WordStar word processing.

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References are made throughout this manual to the Control Program for Microprocessors, commonly known as CP/M. CP/M is a trademark of Digital Research of Pacific Grove, California.

1. The first part of the document is a list of the names of the persons who have been named in the document.

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Technical Support
Standard Industrial Classification
General Information
On Request
Special Vendors
Other Information
Unpublished

Technical Support

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1-2
1-3

Technical Support
Standard Industrial Classification
General Information
On Request
Special Vendors
Other Information
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Technical Support

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Technical Support
Standard Industrial Classification
General Information
On Request
Special Vendors
Other Information
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Technical Support

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Technical Support
Standard Industrial Classification
General Information
On Request
Special Vendors
Other Information
Unpublished

with integrated printing.

Previously entered are dis-

actions take place imme-

image: additional enhance-

option adds form letter

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:

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

Hyphen-Help

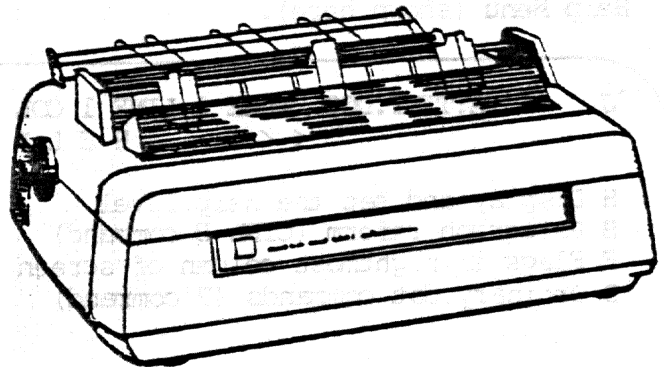
WordStar can identify desirable places to divide a word between lines with a hyphen. At each occurrence, the operator may decide whether to hyphenate, and optionally adjust the hyphen position. Hyphen-Help inserts temporary hyphens which do not print if moved to mid-line by later reformatting.

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 diskette 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 (CO_2), **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_2).

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:

- starting and ending page numbers
- use of "form feed" characters
- pausing between pages for single-sheet paper loading
- printing exact file contents without page formatting
- 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.

Print-Time Conditionals

WordStar allows you to write conditional statements to control printing of a document. These statements may be compounded and may contain arithmetic and logical terms.

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 CP/M 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 CP/M (also Apple II 16 x 40). If the CRT has line insert and line delete functions, these will be used for split 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. Certain memory-mapped video boards meeting requirements detailed in the Installation Manual can alternately be operated in direct memory access mode for extra fast and smooth screen update.

Printer Compatibility

WordStar will drive almost any printer, whether it is Teletype-like or daisy wheel, and whether it is accessed via CP/M's "list output" logical device or via direct hardware I/O instructions issued by WordStar. OEM daisy wheel and similar printers are supported when used with the MicroPro "I/O Master" S-100 interface board.

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 supplied with WordStar allows easy menu selection of any of about twenty common terminal types and of one of the following printers (see Appendices A, B, and C for complete lists):

- Diablo 1610/1620/1640/1650
- Qume Sprint 5
- NEC Spinwriter 5510/5520
- OEM daisy wheel printer (Diablo Hy-Type II, Qume Sprint 3, NEC 5500D) connected to either a MicroPro "I/O Master" interface board or an Imsai PIO-4/4 with an Imsai cable G
- Teletype-like printer

Operation of the INSTALL program is described in the **Installation Manual**. Installation for unusual terminals, video boards, and printers is handled by "patching" the program. Extensive provisions have been made for user patching to accommodate 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

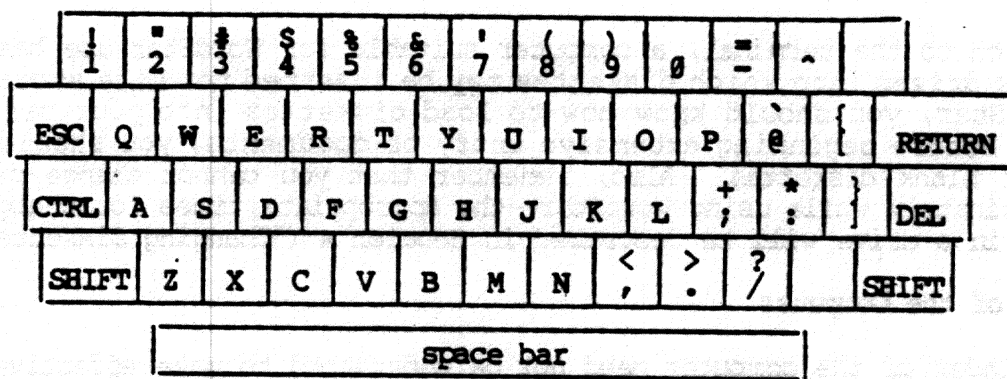
Many terminals have some way of making certain text stand out on the screen. One common method is to use bright and dim display; another is inverse video, whereby the characters to be differentiated are black on a white background instead of white on a black background. If your terminal has one of these 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 split screen 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 (see Appendix B of the Installation Manual for keyboard arrangements of special versions such as the TRS-80 Model I):



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.

LINE FEED: same as ^J.

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

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 diskettes may be inserted for file storage. To use WordStar, you should know how to load diskettes into your particular drives. Before beginning extensive entry of documents, you should have a supply of blank diskettes. Also, remember that you cannot change diskettes indiscriminately while using WordStar--the appropriate times for changing the diskette in a drive will be described in Section 4 ("Changing Diskettes").

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 CP/M and a few other operating systems. The operating system is used by WordStar to maintain files of data on diskette, 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 CP/M, the system's "console command processor" (probably referred to as the CCP in your system manuals) is invoked. It prompts with "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 CP/M commands ("console commands") which can be given at this point. Functions performed by CP/M commands needed in conjunction with WordStar use include:

- Determining the amount of space left on a diskette (STAT command in most systems).

- Determining the size of a particular file ("STAT filename").
- Making a copy of a file on another diskette (PIP command).

PIP may be used to make backup copies of documents, as well as to set up diskettes (Section 4). You may also use the WordStar copy command to copy files (refer to the Reference Manual).

...the size of a particular file (or files) ...
...a copy of a file on another diskette ...
...to make backup copies of documents ...
...the way also ...
...to the ...

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Section 3

Files and Diskettes: 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 diskette.

Text files

Files containing text are used to store documents, such as letters, books, grocery lists, and so on diskette. 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 a CP/M system command (REN) 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
X

LETTER.DOC
GROCERY.LST

CHAPTER1.DOC
XX5-8-79.DOC

Drive Name

The third part of a file name, a 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 drives) specifies the drive (A or B) containing the diskette for 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 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 diskette, except that you should not use type "BAK" (backup). Choose something that helps you remember the file contents.

DISKETTES AND FILES

The Logged Disk Drive

The "Logged Drive" (or current logged drive or current drive) is the disk drive used for any file for which no drive letter is entered when the file name is entered. The logged drive is drive A when the operating system (CP/M) is started. The logged drive may be changed with a CP/M command (by typing drive letter followed by a colon to the console command processor), or with WordStar commands (described later). For example, if you are going to be working with files on a diskette in drive B, you might find it convenient to change the logged 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 diskette) of the logged drive. Thus, to view the file directory of drive B, you must change the logged drive to drive B.

Diskette Capacity

A diskette has a fixed capacity in characters (bytes). This is the total for all files on the diskette, including non-text files such as the WordStar program or PIP or STAT as well as your documents. The exact number of characters varies with the diskette type and system; an ordinary 8-inch single-density IBM-compatible diskette will hold a total of 241K (243,892) characters on most systems. The total number of files is also limited (sometimes to 64), but unless you use very short files, the total number of characters is the limiting factor.

If a diskette gets full, it may be impossible to save a document that has just been entered or corrected. It is not permissible to change diskettes after entry or correction of a file has begun, so check your disk space (STAT command in most systems) before commencing entry or correction. If the diskette 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 (STAT filename 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 diskette equal to twice the size of your largest document. When the space gets less than this, start a new diskette; if you are going to be adding to existing files, move some of them to the new diskette.

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 diskette. 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 diskette, etc.

In microcomputer word processing, the best method of backup is to make a copy of the file on a different diskette, then remove this diskette 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 diskettes carefully - next time you go to use the document, you will want to be sure you can identify the latest version!

Files may be copied in most systems with a command called "PIP"; 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 diskette; 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 diskette loss ever occur. **Back up your files!**

Section 4 Files and Diskettes: Part 2

SETTING UP DISKETTES

Initializing diskettes 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 diskettes 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 diskettes at hand and make sure all operators know how to monitor the empty space on their diskettes.

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 diskette 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 diskette in the drive you call it from (normally A). (You can select another name during installation. For details, see the Installation Manual.)
---------------	---

WSMSG.S.OVR	Message File. The text of all WordStar messages and menus. This file should always be on-line when WordStar is in use. WSMSG.S.OVR may be on the diskette in drive A, or in the diskette in the logged drive (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-line at all times in order to use WordStar.
-------------------	---

MAILMRGE.OVR	MailMerge File (Optional). MailMerge overlays. This file, which must be present on the system in order to use the optional MailMerge command, is supplied separately.
---------------------	--

Setting Up a WordStar System Diskette

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

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 diskette, copied from one diskette to another with a special, system-dependent program sometimes called SYSGEN.

2. The files for any "transient" CP/M commands you wish. We recommend STAT.COM and PIP.COM for all diskettes.
3. The files required by WordStar:
 - a. WS.COM, the WS program (as produced by the "installation" procedure, described in the Installation Manual).
 - b. WSMMSG.OVR, the WordStar message text file. This file should always be on the diskette in drive A, or on the diskette in the logged drive.
 - c. WSOVLX.OVR, the WordStar overlay file. This file must always be on the diskette in the logged drive, or on the diskette in drive A. We recommend that you keep a diskette containing all three of these files in drive A whenever you use WordStar.
 - d. MAILMRGE.OVR (optional). This file must be present on the diskette in drive A (or in the logged drive) in order to use WordStar's MailMerge capability.

In most systems, files (items 2 and 3) are moved with the CP/M utility program PIP; refer to your operating system documentation. Once your WordStar is installed, a WordStar command may also be used to move files.

Work Diskettes

A diskette in drive B can be used for document file storage only. It need have none of the above items on it (provided WSMMSG.OVR and WSOVLX.OVR are on the diskette in drive A), making its entire capacity available for document storage. (However, it is often to include items 2 and 3 for convenience.)

Note

For WordStar to operate, there must always be a diskette in drive A, and also in the logged drive if other than A.

CHANGING DISKETTES

The Simple and Safe Rule

Change diskettes only when the system is ready to accept a command (A> or B> prompt), and after changing diskettes type control-C (^C). Don't forget the ^C! Changing diskettes at the wrong time, such as when WordStar is editing or printing a file, or forgetting the control-C results in errors under some versions, and destroys existing files under other versions. Under certain systems, ^C is unnecessary, but it does no harm.

The WordStar Exception

When WordStar is running, diskettes 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 diskette, and eliminates the need to have WS.COM take up diskette space when working with large files.

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

Caution

Never change diskettes 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 diskette 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 diskette 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 diskette 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.

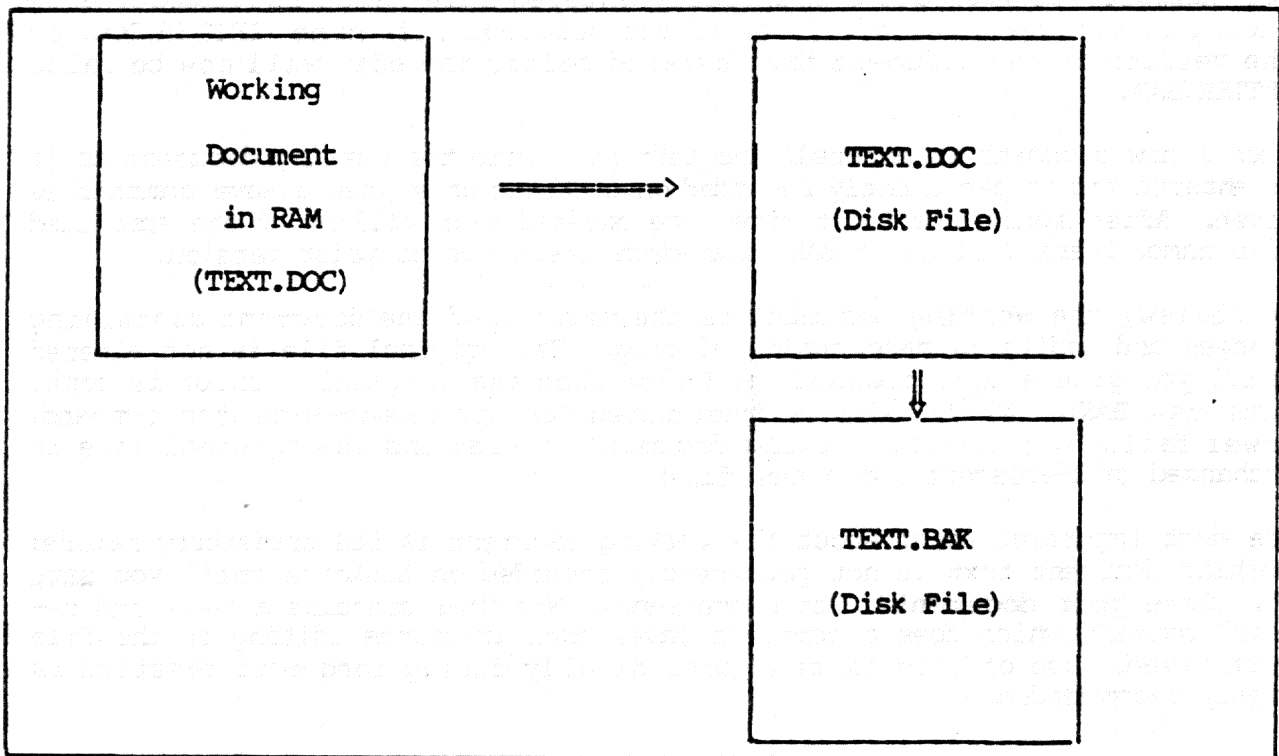
If you discover after saving that you made drastic errors while editing file LETTER.DOC, you may recover the prior version by using operating system commands to copy or rename LETTER.BAK to LETTER.DOC, or by using WordStar's "read additional file" command.

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 diskette space for the additional working file.

Thus, large files can be edited most rapidly and with minimum diskette 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.

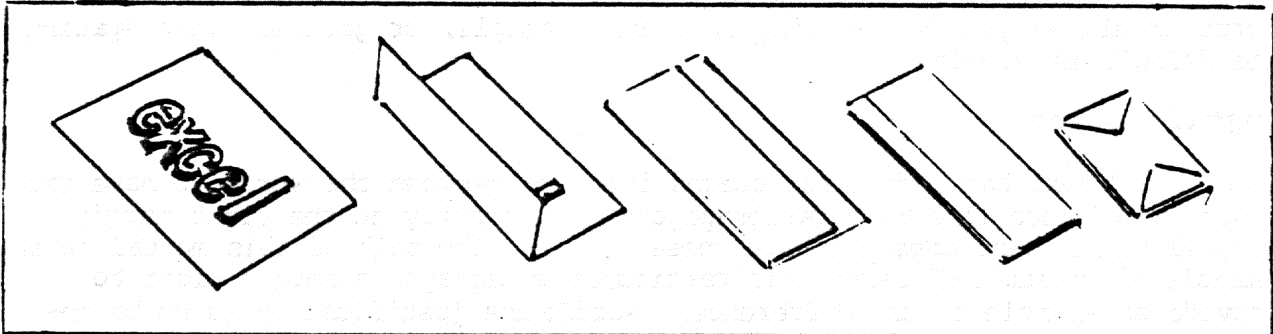
Forming a line

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.



Word Wrap

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:

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.

Appendix A

Terminals Supported

In general, WordStar may be run on any 48K Z-80, 8080, or 8085 microcomputer system that runs under CP/M, MP/M or one of its derivative operating systems. Here are the terminals to which WordStar is known to be compatible, listed in five groups (terminals supported with standard installation, terminals supported with special installation, terminals available on request, terminals for which special versions of WordStar are available, and terminals currently under evaluation or development).

STANDARD INSTALLATION

The following terminals are supported through simple responses to the standard installation menus:

ADDS Regent 25	Lear-Siegler ADM-3A
ADDS Regent 45	Lear-Siegler ADM-31
ADDS Regent 60	MicroTerm ACT-IV
Beehive 150	MicroTerm ACT-V
Compucolor II	Perkin-Elmer 550
Cromemco 3100	Processor Tec SOL/VDM
Data General D100/D200	Soroc IQ-120
Flashwriter I	Soroc IQ-140
Flashwriter II	SWTPC CT-82
Hazeltine 1400/10/20	TEC Model 571
Hazeltine 1500/10/20	Televideo 912/920
Heath H-19 (Zenith Z-19)	Televideo 950
Hewlett Packard 2621A/P	TRS-80 Model II with FMG CP/M
IMSAI VIO module	TRS-80 Model II with LIFEBOAT CP/M
IBM 3101	TRS-80 Model II with P&T CP/M
Infoton I-100	Visual 200

SPECIAL INSTALLATION

The following terminals are supported through "Patch" sheets (available from your dealer):

DIRECT VP800/B

Lear-Siegler ADM-2

The following terminals, similarly supported, will soon be available:

Beehive DM30

Infoton 400

DataMedia Model 2500

Lear-Siegler ADM-42

DataMedia Model 3025

OMRON 8030B

EBCO Model D300/400

Perkin-Elmer OWL-1200

ELBIT DS-1920X

Teleray Model 12

ELBIT DS-4801X

Teleray 3900

SPECIAL VERSIONS

Special versions of WordStar are available for the following terminals:

Apple II 80-column

Heath H-89 (Zenith Z-89)

M&R Sup'R'Term (and others)

with Zenith CP/M

Videx Videoterm (and others)

Superbrain

Heath H-89 (Zenith Z-89)

with DOS Version 2.0

with Magnolia CP/M

Superbrain

with DOS Version 3.0

UNDER CONSIDERATION

The following terminals are presently under consideration for possible future support:

Ampex Dialogue 80

MicroAngelo VDU

Datamedia DT80/1

Screensplitter VDU

DEC VT132

SSM VB1B Video module

GTC Model 101

SSM VB2 VDU

Hazeltine 1552

SSM VB3 VDU

Hazeltine Series 80

TRS-80 Model III

IS 64 x 16 VDU

Xitec SCT-100 VDU

Ithaca Audio 64 x 16 VDU

NOT SUPPORTED

Wordstar cannot currently be run on the following systems:

PET (Commodore)

SWTP Co.

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Appendix B Formats Supported

FORMATS SUPPLIED BY MICROPRO

The following disk formats are supplied by MicroPro:

Apple II 13-sector	North Star single-density
Apple II 16-sector	North Star double-density
Dynabyte DB8/2	Superbrain 2.0/3.0
8-inch Standard	Vector Graphic (Micropolis drive)
Heath H-89 (Zenith Z-89)	Vector MZ (Tandon drive)
Micropolis Model II	Xerox 820

FORMATS SUPPLIED BY MICROPRO O.E.M.s

The following disk formats are supplied by original equipment manufacturers (O.E.M.s) of MicroPro products:

Archives	Kontron Elec.
Datavue	Omikron Data (TRS-80 Model I)
Epic	Osborne
Gnat (WordStar only)	PBM
Hurricane Labs (TRS-80 Model III)	Toshiba
Industrial Micro Systems (5 1/4")	

FORMATS SUPPLIED BY DISTRIBUTORS

The following disk formats are supplied by various MicroPro distributors:

Altair 8800 disk	Micropolis Model I
AVL Eagle	MTS 3200/3202
BASF System 7100	MSD 5-inch
Black Hawk single-density	Nylac single-density
CDS Versatile 3B	Ohio Scientific C3
Cromemco Z2D	Processor Technology Helios II
Digi-Log Microterm II	Quay 500/520
Durango F-85	RAIR
Exidy Sorcerer with Exidy CP/M	REX
Icom 2411 micro floppy	Sanco 7000 5-inch
IMS 5000	SD Systems 5-inch
Insai 5-inch	TEI 5-inch
Intel MDS	Vista V80 5-inch, single-density
Kontron PSI-80	Vista V200 5-inch, single-density
Meca 5-inch	

Appendix C Printers Supported

WordStar currently supports two kinds of printers, specialty printers and teletype-like printers.

SPECIALTY PRINTERS

The following bidirectional printers, which offer microspace justification, are supported through responses to the standard menus:

Diablo 630	NEC 5500 w/Diablo Hi-Type II interface
Diablo 1355/55A/55WP Hi-Type I	NEC 5510/20 w/serial interface
Diablo 1610/20 w/serial interface	NEC 5515/25 w/Diablo look-alike serial
Diablo 1640/1650 (not 1641)	NEC 5530
ITOH StarWriter 1500	Qume Sprint 5 w/serial interface
ITOH Model 1540	Xerox 1710/20
ITOH VISTA V300	Xerox 1730
	Xerox 1740/50

TELETYPE-LIKE PRINTERS

The following Teletype and Teletype-like printers, which generally support all WordStar features except bidirectional printing and microspace justification, are also available through responses to the standard installation menus:

Alphacom Sprinter 40	ID 440G
Anadex DP-8000	Malibu 165
Anadex DP-9500/01	MicroTek MT-80
Base II Model 800B	MPI Model 88
Centronics 700-9	Okidata Microline 80
Centronics 730	Paper Tiger 445G
Centronics 737	Paper Tiger 460G
Centronics 779	Paper Tiger 560

Comprint 912

Teletype 40

DEC LA34

Teletype 43

Eaton LRC7000

Quantex Series 6000

Epson TX-80

Texas Instruments TI-810

IBM Selectric (serial)

Xymec HY-Q 1000