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# WOPROC

## A Word Processing System

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**WOPROC OPERATING SYSTEM MANUAL  
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# Chapter 1

## WOPROC System Introduction

### Using the WOPROC System Manual

This manual is a complete user's guide for the WOPROC Word Processing System. The manual is divided into six chapters:

#### Chapter 1. WOPROC System Introduction

This chapter describes what the WOPROC System is designed to do and summarizes its features.

#### Chapter 2. Getting On Line with WOPROC

This chapter describes the WOPROC Release Package and explains how to build both a Phideck and an audio cassette WOPROC System from the WOPROC release cassette.

#### Chapter 3. WOPROC Hardware Components

This chapter describes the WOPROC hardware configuration required and the unique functions of the TV Display, Keyboard, Phidecks, and Printer.

#### Chapter 4. Using the Phideck WOPROC System

This chapter is an overview describing how to start a Phideck WOPROC system, the Main Menu Display, and the choices available on the Main Menu.

#### Chapter 5. Using the Audio Cassette WOPROC System

This chapter is an overview describing how to start an audio cassette WOPROC system, the audio cassette system Main Menu Display, and the choices available on the Main Menu. Differences between the Phideck and audio cassette versions are described here.

#### Chapter 6. WOPROC System Software

This chapter contains a detailed description of the creation and editing of documents. All of the editing commands are described as well as text rulers, pagination, screen typeout of text, document printing, and embedded printer control.

#### Appendix A. Printer Interfacing

This appendix explains how the Digital Group printer is driven by the WOPROC System Software and explains how the user can interface a non-Digital Group printer to the system and create the required driving software.

### WOPROC System Description

WOPROC--A Word Processing System--is easy to use, easy to learn, responsive in operation, and has many capabilities.

#### Ease of Use

The system can be used by anyone who wants to prepare typewritten material quickly, simply and efficiently.

#### Ease of Learning

In less than an hour, a novice can be using the system for productive work. Menus describe the choices available and prompting dialogue tells the user what to do and what is happening. The editing commands were chosen to be as meaningful as possible. A "help" command produces a screen display of all editing commands at any time.

#### Responsive Operation

All system operations are performed immediately when typed and entered. The screen of the TV display terminal is always updated to show the effect of each command typed. Changes to the display are made very quickly. Commands are either a single keystroke or the 'ESC' (Escape Key) followed by a single keystroke.

#### Powerful Capabilities

The system offers many features not found on other systems, especially other text editors designed mostly for preparing computer programs. The powerful facilities significantly increase the speed with which editing changes can be made and significantly increase operator productivity.

## System Applications and Capabilities

The WOPROC System has a wide variety of applications and capabilities. It can be used to create and edit sales lists, legal documents, letters, documentation, books and articles, term papers, homework, recipes--any activity that requires typing and correction of text. Three of the more important applications of the system are:

1. Preparation of lengthy reports which may require several drafts before the final printing. Changes are easy. Printer routines allow rough drafts to be typed out at any time. Ruler and printer reformatting capabilities allow drafts to be double-spaced with wide margins while final output appears in normal form.
2. Preparation of form letters where only a few changes need to be made to each copy. The source document stored on tape is specified and loaded for editing. The phrase search command is used to quickly find the location where changes need to be made. These can be made easily and the letter filed for printing.
3. Preparation of manuscripts for books where chapter titles and chapter page numbers need to be included. Corrections, insertions, and deletions are simple and a corrected manuscript with proper titling and page numbering can be printed at any time.

## Summary of Features

- Over 100 pages of text can be stored on a Phideck cassette. Storage space is not pre-allocated. A cassette may contain a few 30 page documents or up to 100 short documents. Any mix of long and short documents is possible. Storage is compact. A one paragraph memo uses a fraction of the space required for a one page document.
- Additional storage space on the WOPROC System cassette allows the user to store a small number of standard documents. These can be called in and edited and written out to other cassettes.
- Rulers specifying margins, printer spacing, and tabbing control are stored within the text. These imbedded rulers show where tabs are set, margins are located and where the right margin will be justified. Rulers also control paragraph indentation and centering of lines. Rulers may change many times throughout a particular document.
- "Menu" prompting of commands on the screen helps make the system self-teaching. There are no command lines for the user to remember. Whenever a command must be typed and entered, a command menu is displayed on the screen.
- "Spooler" printing operation allows the user to specify up to eight documents for unattended printing. Documents will be printed in the order that print commands were given.
- A driver for the Digital Group Printer is included as a standard part of the system. This allows the user to specify the type pitch (8, 9, 10, 11, 12 or 13), expanded characters, left margin, right margin (either ragged or fully justified), and page size. Justification is accomplished by adding "white space" in small increments between words on a line until the right-most letter is on the right margin.
- Expanded characters can be used for emphasis.
- Adaptable to other printers. Information is included for adding a custom printer driver. Thus the knowledgeable person can utilize a space-oriented printer such as a Selectric typewriter or teletypewriter, a letter quality printer such as the Diablo or Qume printer, or any other printer available.
- Complete editing features, including:
  - Fully formatted screen display--screen display and the printed output are nearly identical.
  - Cursor movement throughout the text by character, word, line, sentence, paragraph, and page.
  - Automatic text insertion when you type the characters.
  - Deletion of characters, words, and sentences.
  - Forward and reverse searches throughout the text for specified phrases, and replacement with alternate phrases if desired.
  - Centering on a line--a special editing key automatically centers text between the left and right margins or around a selected point.

## Chapter 2

### Getting On Line With WOPROC

#### The WOPROC Release Package

The WOPROC Word Processing System is supplied to the user as a package containing:

1. A WOPROC Audio Cassette Tape  
(Suding 1100 baud format) containing:
  - a. A Phideck based WOPROC System. (Side 1)
  - b. An audio cassette based WOPROC sysytem.  
(Side 2)
2. A WOPROC Word Processing System Manual

The PHIMON Operating System is a prerequisite for using the Phideck WOPROC system.

It is recommended that the distribution tape only be used for building an operational system as described below.

#### Building a Phideck System

1. Load up the PHIMON system.
2. Prepare the audio cassette recorder with Side 1 of the distribution tape.
3. Enter the command "READ 1000-55000", and read in the audio file.
4. Enter the command "SAVE WOPROC 1-55 \* 5000" to save the program.
5. To verify the above steps and execute the program, enter "RUN WOPROC".

#### Building an Audio Cassette System

1. Place Side 2 of the WOPROC distribution tape into the cassette recorder.
2. Turn on power to the system.
3. Read the tape into the system.
4. Make a working copy of the program by placing a tape in the cassette recorder, then selecting option 2 (Write) from the menu.
5. To execute the program, select option 7 from the menu.

# Chapter 3

## WOPROC Hardware Components

### WOPROC Hardware Configuration Requirements

The following hardware items are required for a WOPROC Phideck Word Processing System.

- 18K or larger Digital Group Z-80 System
- 64 character TV and cassette interface board
- Two or more Phideck drives and a Phideck controller
- Digital Group printer or other hard copy device such as a Selectric I/O typewriter, Teletype, line printer, matrix printer, or letter quality printer such as a Diablo or Qume
- PHIMON Operating System and PHIMON PROM
- Digital Group keyboard or equivalent unit

The following hardware items are required for a WOPROC Audio Cassette Word Processing System.

- 18K or larger Digital Group Z-80 System (Since all text must be stored in memory, adequate memory for the job must be available.)
- 64 character TV and cassette interface board
- Audio cassette player and "ZE" PROM
- Digital Group printer or other hard copy unit as above
- Digital Group keyboard or equivalent unit

**Note:** Lack of computer-controlled mass storage limits the audio system considerably, as described in Chapter 5.

### The Display Screen

WOPROC uses the standard Digital Group 64 character by 16 line TV and audio cassette board. The system will not run using the 32 x 16 TV board.

Documents or letters are typed on the keyboard. As they are typed, they are displayed on the screen, and as necessary, they are recorded onto the Phideck cassette from the memory of the machine as shown in Figure 3-1.

The display screen serves as a "window" through which the text in memory can be observed. When a document or letter is corrected, it is read from the Phideck cassette and displayed on the screen via the memory of the processor. The cursor can be moved through the text in both the forward and backward directions. A complicated algorithm using a tape stack area on the Phideck system tape permits this forward and backward movement even though some of the edited text may have been written out to the destination tape.

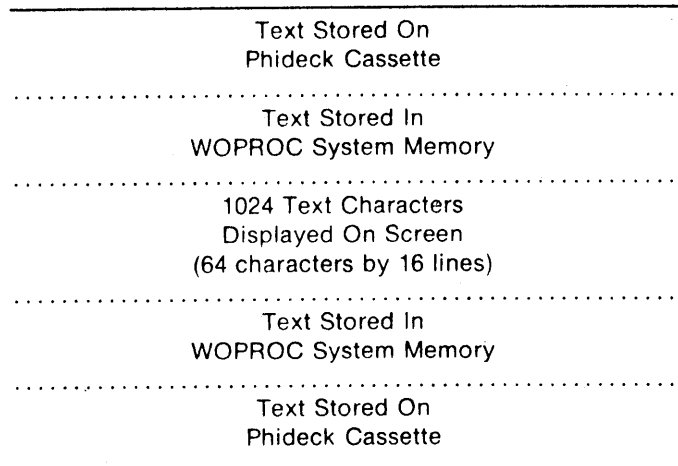


Figure 3-1

### The Keyboard

The WOPROC System was designed to be used with the Digital Group KEY-1 capacitance keyboard. This keyboard includes the special keys that produce the codes listed in Table 3-1.

Any other keyboard will work provided the user can identify the control keys that will produce the special codes.

Key Legend	Use	Codes
→	Move cursor right	214
←	Move cursor left	210
↑	Move cursor up	213
↓	Move cursor down	212
HOME	Home cursor	236
ESCAPE	Pressed prior to pressing command key	233
RUB	Delete character	337
LF	Delete sentence	212

Table 3-1

## **The Phideck Cassette Unit**

Two Phideck tape drives are necessary to run the WOPROC system. The WOPROC system cassette must be placed in drive #0 and the document cassette in one of the other drives. Up to four drives can be supported.

The standard Phideck interfacing method is used as described in the Phideck and PHIMON manuals. A properly running PHIMON system is essential.

Up to 100 different documents can be stored on one document cassette. Each document may be up to 100 pages in length on a single cassette. Any mix of document sizes is possible up to this capacity.

WOPROC allows you to edit a document in either the forward or backward direction, even if some of the text has been written out to tape. A tape storage scheme which utilizes the system cassette (Phideck Drive #0) for temporary text storage requires that adequate scratch area be available. It is recommended that the system cassette contain only the PHIMON System, the WOPROC system, and a few small standard documents (if necessary) to allow maximum space for this scratch area.

Do not remove either the WOPROC system cassette or a document cassette that is currently in use until the current document has been filed (if desired) and the 'F' (Finished) command on the Main Menu has been used. Otherwise, certain system housekeeping functions may not be completed leading to possible system problems.

The PHIMON "PIP" program should be used to make backup copies of the WOPROC system in addition to important documents.

## **The Printer**

The WOPROC System is supplied with a driver for the Digital Group 96 column dot matrix printer. The unit is connected in the standard way as described in the printer documentation manual.

Other printers can be used with the system by following the interfacing instructions contained in Appendix A.

## **Audio Cassette Unit**

The WOPROC Systems are supplied on a Suding 1100 baud standard audio format cassette. A properly functioning audio cassette unit is necessary to build a system.

Included with the WOPROC release package is an audio cassette stand-alone system designed to run on the standard Digital Group Z-80 system with a "ZE" ROM. This system includes most of the features of the Phideck WOPROC System as described, with the exception of the mass storage features. Files can be loaded from audio cassette into memory, edited, and then written out onto audio cassette tape. The user is limited to editing the amount of text that will fit into the main computer memory. The system automatically adjusts the text buffer size to include all available memory. Details on the Main Menu for the audio cassette version and other differences between the Phideck and audio cassette versions are covered in Chapter 5.

# Chapter 4

## Using the WOPROC Phideck System

### Starting the Phideck WOPROC System

1. Place the WOPROC system cassette in drive #0.
2. Place a PHIMON system or nonsystem cassette in one of the other drives.
3. Power up the system. PHIMON will load in and display its prompt.
4. Type 'RUN WOPROC (CR)'

### The Main Menu

After a short delay the display produces the Main Menu as shown in Figure 4-1. Typing 'ESC-M' at any time during editing will redisplay the Main Menu.

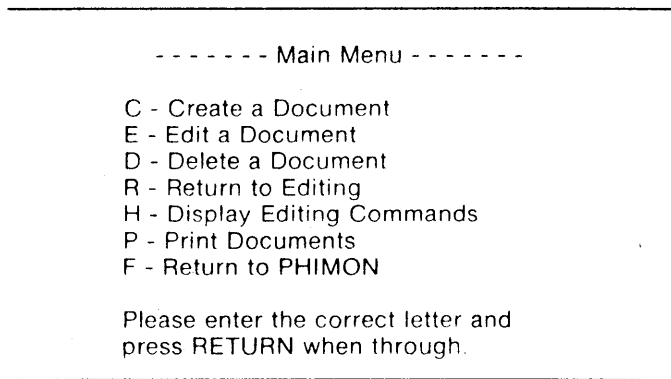


Figure 4-1

### Creating a Document

Documents are created by pressing the 'C' (Create Document) key on the Main Menu. The system will respond with a display asking for the document name, and then asking for the destination Phideck unit number.

Refer to Chapter 6 for detailed instructions on typing and editing the document.

### Editing a Document

An existing document may be edited by pressing the 'E' (Edit Document) key on the Main Menu. The system will respond with displays asking for the document name, the source Phideck unit number and the destination Phideck unit number. If a specified document cannot be found, a "File Not Found" display will appear. Press 'RETURN' to continue.

Refer to Chapter 6 for detailed instructions on editing a document.

### Deleting a Document

Documents are deleted from a Phideck cassette by pressing the 'D' (Delete Document) key on the Main Menu. A display asking for the name of the document to be deleted will appear followed by a display asking for the Phideck unit number. The Main Menu is displayed if the document is found and deleted. If the document cannot be found on the specified drive, a "File Does Not Exist" display will appear. Press 'RETURN' to continue.

### Return to Editing

Typing the 'R' (Return To Editing) key on the Main Menu will return the user to editing the current document. The screen display and the text will be the same as they were when 'ESC-M' was typed to display the Main Menu. Editing can now continue from that point.

### Print Documents

Typing the 'P' (Print Documents) key on the Main Menu will display the Print Menu. A detailed explanation of the choices contained on the Print Menu is contained in the section on printing documents in Chapter 6.

### Editing Command Display

Typing the 'H' (Help) key on the Main Menu will cause the 'Help' display shown in Figure 4-2 to appear with a listing of all of the WOPROC editing commands. Pressing 'RETURN' will restore the Main Menu display.

At any time during editing, typing 'ESC-H' will also blank the screen and produce the 'Help' display. Pressing 'RETURN' will return the user to the editing mode with nothing changed.

WOPROC EDITING COMMANDS					
<Cursor Moves>		<Deleting>		<Searching>	
←, →	Char	RUB	Char	ESC-S	Search
↓, ↑	Line	ESC-RUB	Word	ESC-D	ESC-S,replace
HOME	Top buf	ESC-LF	Sent	ESC-K	ESC-D.keep up
ESC-HOME	Bot buf	<Format>		<Control>	
ESC-W	Word	ESC-(SP)	Tab	ESC-M	Main Menu
ESC-	Sent	ESC-P	Para	ESC-F	File Doc.
ESC-I	Para	ESC-N	New Page	ESC-T	Type Doc.
ESC-G	Page	ESC-C	Center	ESC-R	Ruler
<Printer Control>		ESC-E	Expand	ESC-H	Help
ESC-O	Start				
ESC-CTRL-O	End				
<H<T<S<N	Press RETURN when through				
				ESC-A	Advance Buffer
				ESC-B	Backup Buffer

Figure 4-2

## Chapter 5

### Using the Audio-Cassette System

The audio-version of WOPROC provides word processing capabilities for Digital Group users who may have a hardcopy device, but are lacking Phideck tape drives. The inherent limitations of audio format storage force minor differences in operation of this version, and these are outlined below.

#### Starting the Audio WOPROC System

1. Place the tape containing the WOPROC program in the audio cassette recorder.
2. Power up the system. The "Z-80 INITIALIZE CASSETTE" message will appear.
3. Read in the WOPROC program.
4. Select option 7 to start program execution.

The Main Menu shown below in Figure 5-1 will appear.

---

```
----- Main Menu -----  
  
C - Create a Document  
E - Edit a Document  
R - Return to Editing  
H - Display Editing Commands  
P - Print Documents  
F - Return to OP SYS  
  
Please enter the correct letter and  
press RETURN when through.
```

---

Figure 5-1

#### Creating a Document

Documents are created by pressing the 'C' (Create Document) key on the Main Menu. The system responds with a display ready for typing text into the system.

Refer to Chapter 6 for detailed instructions on typing and editing the document.

#### Editing a Document

An existing document may be edited by pressing the 'E' (Edit Document) key on the Main Menu. The message "Hit RETURN when ready" is displayed. Load the audio cassette recorder with the tape containing the document to be edited. Start the recorder and press the RETURN key.

#### Return to Editing

This function operates as described for the PHIMON version.

#### Editing Command Display

This function operates as described for the PHIMON version.

#### Print Documents

Typing the 'P' (Print Documents) key on the Main Menu displays the print menu shown in Figure 5-2.

---

```
----- Print Menu -----  
  
B - Print Documents in Memory  
C - Continue Printing  
R - Read in Text  
S - Set Printer Controls  
M - Return to Main Menu  
  
Please enter the correct letter and  
press RETURN when through.
```

---

Figure 5-2

Documents cannot be queued up for printing because of the lack of file names. Selecting the 'R' (Read in Text) function from the print menu will read text from the audio cassette recorder into memory to be printed.

#### Other Considerations

During editing, all text must be in memory. There are no provisions for editing files larger than available memory. Document file management is the responsibility of the user. Names may not be assigned for retrieval purposes.

Entering 'ESC-A' while editing causes text to be read from the tape into memory. This is equivalent to entering 'ESC-M', followed by 'E' to edit a file. Entering 'ESC-F' while editing causes the text in memory to be written to tape.

## Chapter 6

### WOPROC System Software

The WOPROC system software has three main parts: the Menus, the Editor, and the Printer.

The Main Menu is the dispatcher in the system. It is a list of reminders of what commands are available. When a user types a command, the Main Menu transfers control to the appropriate part of the system. All features of the system are displayed in the Main Menu. This means that the user does not normally need a manual when operating the system. A new user can easily determine what the primary commands and their formats are by simply reading the Main Menu and following the prompts provided after the selection is made.

The Editor is the part of the system that allows a user to type in letters and documents and make corrections. It always displays the text of the document on the screen in a manner that reflects as nearly as possible the appearance of the final printed page. The Editor is a "bottom line" editor, similar to a typewriter. The user is always typing on the bottom line of the display. Corrections can only be made to text that appears on this line. A set of editing keys provides excellent editing features and capabilities. These keys make it possible to bring any line of the document to the bottom line of the screen for editing, quickly and easily.

The Printer reads letters or documents stored on the cassettes and types them out on a Digital Group Printer or a user interfaced printer. It handles top and bottom margins, and can paginate the document and justify the right margin of the text. Documents can also be queued to the printer so that it can type several of them in a row unattended.

#### Document Naming

Documents are named by using a standard PHIMON name of up to 6 characters. When the document is filed, it will be written onto the specified Phideck drive and its name will be entered into the PHIMON cassette tape directory. All documents have the default extension of '.TX'.

When a document name is typed for editing, the proper Phideck drive directory is searched for that document. If it is not found, a "File Does Not Exist" display appears on the screen. Press 'RETURN' to continue.

When filing a document, a previous document with the same name will be deleted if there was one on the same drive.


#### WOPROC Keyboard Commands


An attempt has been made to make the system as "user-oriented" as possible. All keyboard commands are either a specially labeled single key or the 'ESC' (Escape) key followed by a single keystroke. Whenever possible, the most obvious key choice was selected.


After a short practice session, the user should be able to immediately recall all necessary commands. Since a memory refresher may be helpful at times, pressing 'ESC-H' (Help) will cause a display of all the editing commands and their functions. Pressing 'RETURN' will restore the original TV display.


A description of each of the keyboard commands follows. Refer to the following sections on editing documents for detailed explanations of their use.


#### Cursor Movement Keys


 Moves cursor forward one character at a time. Also places the system in the advance mode so that subsequent searches and typing will proceed toward the bottom of the document.


 Moves cursor backward one character at a time. Also places the system in the backup mode for subsequent operations.


 Moves cursor forward one line at a time and sets the advance mode.


 Moves cursor backward one line at a time and sets the backup mode.


 Moves cursor to the top (first line) of the document.

 Moves cursor to the bottom (last line) of the document


 Moves cursor one word in the current direction mode.


 Moves cursor one sentence in the current direction mode


 Moves cursor one paragraph in the current direction mode.

 Moves cursor one page in the current direction mode.


#### Delete Keys


 Deletes the character to the left of the cursor.


 Deletes the word to the left of the cursor.

 Deletes the sentence to the left of the cursor.

#### Search Keys

 Searches in the current direction for the first occurrence of a specified phrase and positions the cursor at that location.

 Searches in the current direction for the first occurrence of a specified phrase and replaces it with a specified replacement phrase.

 Searches in the current direction for every occurrence of a specified phrase and replaces each occurrence with a specified replacement phrase.

## Formatting Keys

ESC	(space)	Inserts a tab to the next tab stop position as specified in the current ruler.
ESC	P	Inserts a paragraph marker in the text causing a line feed and an indentation to the paragraph position as specified in the current ruler.
ESC	N	Inserts a new page marker in the text.
ESC	C	Inserts a centering marker in the text causing the preceding line of characters to be centered around the 'C' in the current ruler
ESC	O	Inserts a 'start printer control' marker in the text.
ESC	CTRL/O	Inserts an 'end printer control' marker in the text.

## Control Keys

ESC	M	Displays Main Menu.
ESC	H	Displays "Help" keyboard command listing.
ESC	F	Causes the current document to be filed.
ESC	T	Types out the text in the current direction on the TV display.
0	9	Controls the speed of the text typeout. '0' is the slowest and '9' is the fastest.
	CTRL/C	Stops the text typeout.
ESC	E	Prints the character in expanded format.

## Document Creation

When the Create command ('C' on the Main Menu) is selected, the message "Enter the Name of the Document" appears. Type the name you have chosen for the document (up to six letters) and press 'RETURN'. The message "Enter Destination Deck Number" then appears. Type the deck number of the drive you want the document to be stored on and press 'RETURN'. This must be a deck number other than zero. Incorrect responses will be ignored until a non-zero number is entered.

The display shown in Figure 6-1 will then appear, indicating that the system is ready to allow the user to create the document using the editor. The standard ruler is included, and may be changed as necessary.

---

DOCUMENT: 'Document Name'  
LENGTH IN BLOCKS: 23  
BLOCKS LEFT ON UNIT 2: 123  
L --- P ----- C ----- R

---

Figure 6-1

## Document Editing

When the Edit command (letter 'E' on the Main Menu) is selected, the message "Enter the Name of the Document" appears. Type the name of the document you want to edit and press 'RETURN'. The message "Enter Source Deck Number" then appears. Any drive number 0 thru 3 can be typed followed by 'RETURN'. The message "Enter Destination Deck Number" will then appear. Type the desired drive number. Incorrect responses will be ignored until a non-zero number is entered.

The display shown in Figure 6-2 will appear indicating that the system is ready to allow the user to edit the document. The ruler displayed is the ruler embedded in the text and the document text appears below the screen, waiting to be displayed and modified.

---

DOCUMENT: 'Document Name'  
LENGTH IN BLOCKS: 17  
BLOCKS LEFT ON UNIT 1: 123  
-- L ----- P ----- C ----- R --

---

Figure 6-2

## Typing a New Document or Editing an Old One

When a new document is created, the header shown in Figure 6-1 is displayed on the screen. A different ruler can be set if desired, and typing can begin.

Typing on the keyboard enters text into the new document. Everything that is typed appears on the screen immediately under the cursor and the cursor moves to the right one position as each character is typed. When the cursor moves past the right margin, it advances to the next line at the appropriate place. If a word is being typed when the cursor goes past the right margin, the whole word is transferred to the next line, leaving a space on the preceding line.

This is called word wrapping. Ruler settings can be changed at any time by pressing 'ESC-R' and making the necessary changes as specified in the section on text rulers. Pressing 'RETURN' will embed the new settings in the text.

There are several ways to correct typing errors on the fly. If an incorrect character is typed, the 'RUB' key can be used to delete that character. The correct character can then be typed in its place. The 'RUB' key can be used repeatedly to delete more than one character. The 'ESC-RUB' key sequence will erase one entire word to the left of the cursor. The 'ESC-Line Feed' sequence will erase the entire sentence to the left of the cursor.

### Handling Large Documents

When the memory is filled, text is automatically written out on tape. Text editing can then be continued. Edit commands only apply to current text in memory. The text that is stored on tape will not be affected by editing the text currently in memory. To advance to the next segment of text on tape, type 'ESC-A'. To "back-up" to the last segment of text on tape, type 'ESC-B'. This procedure retrieves the previous segment of text. To store the entire document when editing is completed, type 'ESC-F'. This procedure will store all of the text on tape.

To print the document, its name must first be added to the print list option as selected from the print menu.

### Positioning the Cursor

All text displayed on the screen while the Editor is in control of the system can be modified at any time. This means that corrections may be made even during original typing. There is no distinction between original typing and editing.

The cursor always stops on the bottom line of the screen during editing. Pressing the '→' key advances the cursor one character position in the forward direction through the text. Each time the key is pressed, the cursor moves one character to the right of its current position. If the cursor moves past the last character on the line, the text on the screen scrolls up one line, and the cursor stops on the first character of the next line of text.

Pressing the '←' key moves the cursor backward through the document in a similar manner. When the cursor is moved back past the first character on a line, the text scrolls down one line, and the cursor stops on the last character of the previous line, but it always remains on the bottom line of the screen.

Pressing the '↓' key causes the text to scroll down one line (toward the bottom of the document) and the cursor stops on the first character on the bottom line of the screen. Pressing the '↑' key causes the text to scroll up one line (toward the top of the document) with the cursor on the first character on the bottom line of the screen.

The cursor flashes an arrow alternating with the character underneath it. The arrow's direction (left or right) is set by cursor movement keys. '←' and '↑' set the left and upward direction and '→' and '↓' set the right and downward direction. Searches will proceed in the direction of the arrow when editing.

### Using the Grammatical Cursor Movement Keys

The key sequence 'ESC-W' moves the cursor one word in the current direction, leaving the cursor at the first character of the word. The key sequence 'ESC-' moves the cursor one sentence in the current direction, leaving the cursor at the first printing character of the sentence. A sentence ends with a period, question mark, exclamation point, or carriage return. No special processing is done to figure out if abbreviations, etc. are the end of a sentence. 'ESC-I' leaves the cursor at the first character of the paragraph. A paragraph starts immediately after two or more carriage returns, after a paragraph marker, after a ruler change, and after any page break. 'ESC-G' leaves the cursor at the first character before or after a page marker.

The cursor does not stop on any special formatting characters with the exception of carriage returns. A carriage return displays as a space when the cursor is on it.

### Inserting and Adding New Text

Insertions can be made at any point in the text by using the keys described above to move the cursor to the desired location, and then simply typing the new text. It is inserted in the document immediately preceding the cursor, and the cursor and the text under and following the new text are pushed one character to the right. The delete character, word, or sentence keys can be used to correct errors. If text is moved around enough to push a word into the right margin side of the screen, the word disappears as it moves to the next line and the text from that point on is un-wordwrapped. Similarly, if enough space is created through deletions for the next word to be brought up from the next line, it moves up to the end of the line, and the text from that point is un-wordwrapped.

## Searching for Text

One of the most convenient ways to locate text is to have the system search for it, rather than manually advancing or backing up the cursor. The key sequence 'ESC-S' blanks the screen and displays the message "Phrase to be Searched For:". Any phrase up to 127 characters in length can be typed in followed by 'RETURN'. The phrase can consist of any printing characters, but case differences are ignored for all characters that are typed in lower case. Consequently, a lower case character will match either case in the text, whereas upper case only matches upper case.

After the desired phrase is typed in, the search is then started in the direction last set by a cursor movement command (as indicated by the winking cursor arrow). The cursor advances or backs up through the text and stops on the first character of a phrase that matches the one typed in. It also stops when it reaches the beginning or end of the text in the current buffer.

## Search and Replace

Words and phrases can be located and changed using the 'ESC-D' (Displace) command. The message "Phrase to be Searched For?" will appear. Type the desired phrase as described in the "Search" command followed by 'RETURN'. The message "Replacement Phrase?" then appears. Type the desired replacement phrase followed by 'RETURN'. The search will proceed in the current direction. When the specified phrase is located, it is automatically replaced by the replacement phrase.

It may be desirable to change all occurrences of a certain phrase to another phrase. This is accomplished with the "Search and Replace and Keep It Up" command. Typing 'ESC-K' will duplicate the search and replace command described above except all occurrences of the search phrase will be replaced by the replacement phrase.

Words containing expanded characters (see below) will be ignored during all search operations. Any changes to expanded characters must be performed manually.

## Text Rulers

One of the most significant features of the Editor is the text ruler. Rulers control the format of text as it appears on the screen and as it is printed. The format of the text in a document can be modified without retyping, just by changing this ruler. A single document can have many different rulers, each affecting a different portion of the document. A ruler appears on the video display as shown in Figure 6-3.

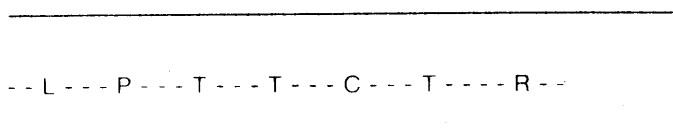


Figure 6-3

Ruler settings associate control letters with different column positions on the screen of the terminal and the printer. The control letters and their corresponding effects are:

- L Sets the column position of the left margin. This is the position to which the cursor returns after the 'RETURN' key is pressed.
- R Sets the column position of the right margin. This is the last position on the line where a character (except a space) can appear. Spaces can appear to the right of this position. When the document is printed, the lines will appear exactly as they were on the screen if a ragged right margin is requested, or justified to this point if justification is specified.
- P Sets the column position for paragraph indents. The editor function 'ESC-P' causes a carriage return followed by an indent to this column. If the P is not present, the left margin (L) is used.
- C Sets the column position for centered lines. The editor function 'ESC-C' inserts a special character which causes all characters on that line to be centered around the 'C' in the ruler.
- T Sets the column position for a normal flush left tab stop. Multiple tabs are allowed. Tab stops are similar to the tab stops on a normal typewriter. Pressing 'ESC-Space' during editing inserts a tab code character which causes the cursor to advance to the next 'T' in the current ruler.

**Note:** Only one setting can be made in each column position.

Text ruler settings are a part of the document in which they appear. Rulers do not print on the printer. They only appear on the screen of the terminal as a dashed line containing some combination of the letters described above. A typical text ruler is shown in Figure 6-3. That ruler sets an indented left and right margin, the paragraph indent, three tab stops, and the centering point. Text beyond this point in the document, up to the next ruler setting if there is one, will conform to these settings. If this ruler is modified and, for example, the second tab stop is moved to the right three positions, the system will automatically reconform all text between this ruler and the next ruler to comply with the new tab setting. If the ruler determines the format of a table, an entire column in that table will be moved to the right three positions.

## Ruler Display and Modification

The current ruler settings in effect at any point in the text can be displayed by positioning the cursor at that point in the text and pressing 'ESC-R'. The text will move up and the ruler settings will be displayed in the format described above.

If no changes are to be made and the 'ESC' key is pressed, the text returns to the bottom of the screen and nothing changes. If the ruler settings are changed, the new settings are stored in an embedded ruler at that point in the text by pressing the 'RETURN' key. An illogical ruler (e.g., R to the left of L) will not be stored until it is made logical.

The ruler settings are changed by using the cursor right (→) and cursor left (←) keys to move the cursor to the desired position and then typing the desired letter. Holding the cursor movement key down will continually move the cursor until the desired position is reached. To erase a setting (clear a tab stop for example), move the cursor to the appropriate column and press the 'RUB' key. The setting is then erased. When typing 'L', 'R', 'P', or 'C', the previous setting will be removed and replaced with the current one.

### New Paragraphs

Typing 'ESC-P' automatically starts a new paragraph by inserting a new line character and indenting to the "P" position in the last embedded text ruler.

### Using Tabs

Pressing 'ESC-Space' will cause the cursor to move to the next "T" position as specified in the last embedded text ruler.

### Centering Lines

Typing 'ESC-C' at the end of a line will cause all characters on the line to be centered around the "C" in the last embedded text ruler.

### Expanded Characters

Characters that are to be typed out in expanded form are first typed in as if normal text. They are converted to expanded form by moving the cursor to that location and pressing 'ESC-E'. A special character is inserted which appears on the screen as a '↑'. This special character will cause the printer to print that following character in expanded form. A large number of characters can be expanded by positioning the cursor on the first and pressing 'ESC-E', 'ESC-E', etc.

### Pagination

Paging can either be done automatically or manually, or some combination of the two.

The user can manually force page breaks into the text by using the 'ESC-N' (New Page) command. This will cause a series of dashes surrounding "New Page" to be displayed at the cursor location on the video display. This appears for display purposes only and will be replaced by a form feed when the document is typed out.

By setting the page length parameter as described in the printer section, page size will be controlled automatically. Printer Control commands may also be embedded in the text to change the page size as the document is being typed out.

Any combination of these methods can be used to produce the desired results.

## Typing Out Text on the Screen

The current document text can be viewed on the display screen by using the 'ESC-T' (Type) command. The text will automatically display and scroll in the current direction as indicated by the winking cursor arrow. Display speed can be adjusted by typing the keys '0' through '9'. The slowest speed is set with the '0' key and the fastest by the '9' key. The typeout can be interrupted at any time by pressing the 'CTRL' and 'C' keys simultaneously ('CTRL/C'). The cursor will remain at the point in the text where the interruption occurred. Editing can continue from that point.

## Filing the Document

When document editing is complete, the document is filed (stored away on the Phideck cassette tape) by typing 'ESC-F'. The Main Menu will be displayed when the filing is complete. The document may then be printed by selecting the 'P' option.

## Printing the Document

### The Print Menu

The Print Menu shown in Figure 6-4 is displayed on the video terminal when the 'P' option is chosen from the Main Menu.

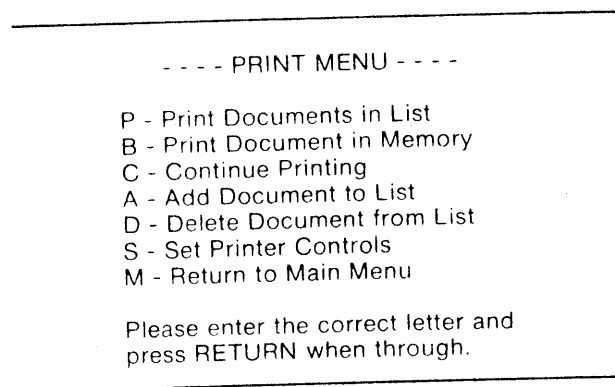


Figure 6-4

### Print Documents Option

Typing the 'P' option starts the printing of documents from the printer queue. If the "Stop Every Document" or "Stop Every Page" options are in effect, make the necessary printer adjustments and type 'C' to continue printing. Typing 'CTRL/C' will halt the printing process. Use the 'C' option to continue printing.

### Continue Printing Option

Typing the 'C' option continues the printing of the documents in the print queue from the interruption point where 'CTRL/C' was last typed, or after stopping between sheets.

### Add Documents to Print List Option

Typing the 'A' option produces the display shown in Figure 6-5 if no documents have been entered into the print list or the display shown in Figure 6-6 if names have already been specified.

---

----- Printer Queue -----

No files

Either type RETURN for Print Menu or enter FILNAM#D (D=deck).

---

Figure 6-5

---

----- Printer Queue -----

FILNAM1#1

FILNAM2#3

|

|

|

|

|

V

(up to 8)

Either type RETURN for Print Menu or enter FILNAM#D (D=deck).

---

Figure 6-6

To add a document to the print list, type the name of the document followed by a '#' immediately followed by the deck number. Make corrections with the 'RUB' key. If eight print files are already listed, the new file name typed will not be accepted. The file name and deck number will appear in the name queue and the system will be waiting for another print file or a 'RETURN' to return to the Print Menu.

#### Delete Documents from Print List Option

Typing the 'D' option produces the display shown in Figure 6-7.

---

----- Printer Queue -----

FILNAM1#1

FILNAM2#3

FILNAM3#0

Enter line # or 0

---

Figure 6-7

To delete a document from the list, type the line number of the document in the list (1 thru 8). Continue typing line numbers for additional files to be deleted from the print queue or 'RETURN' to return to the print menu.

#### Set Printer Controls Option

The 'S' option allows the user to interactively set the printer controls for the form of printing he desires. These will be initialized to the values shown below when the system is started and may be changed with the 'S' option, or by including parameter changes with printer control commands embedded in the text.

The following parameters may be set. The parameters after the equal sign show the initialization values.

M=10      Number of spaces left margin is from left edge of paper.

P=9      The pitch of the type to use with the Digital Group printer. Parameter values range from 9 to 13.

D=YES      Double spacing. Parameter values are YES or NO

E=YES      Flush or ragged right margin. Parameter values are YES or NO. YES will justify; NO will not.

S=YES      Stop after every document. Parameter values are YES or NO.

F=YES      Stop after every page. Parameter values are YES or NO. YES will permit a new page of paper to be loaded in the printer.

C=1      Current page starting number. Parameter values range from 0 to 255.

L=50      Lines per page for body text. Does not include spaces required for header or footer portion. Parameter values range from 1 to 255.

When the 'S' (Set Printer Options) option is selected from the print menu, the display shown in Figure 6-8 appears.

---

----- Printer Controls -----

F - Flush Right = Yes

S - Stop Every File = Yes

E - Stop Every Sheet = Yes

D - Double Spaced = Yes

M - Printer Margin = 10

L - Lines per Page = 50

C - Current Page = 1

P - Pitch = 9

Enter Letter = argument, then hit RETURN

---

Figure 6-8

The Printer Control Parameters are automatically set to the default values when the system is started. If changed using the Set Printer Options command they will remain that way until changed again with the 'S' (Set Printer Control) option, with printer controls embedded in the text as explained in the next section, or by restarting the system which resets them to their initial values.

## Embedding Printer Control in the Text

Two levels of printer control are available. When the system is started, the printer parameters are preset to the most common values used when typing material. These can be changed two ways. They can be interactively changed when the Printer Menu is displayed by choosing the Set Printer control ('S') option already described. They may also be changed by having printer control specifications embedded within the text.

Printer control markers are embedded within a document to control the printing of header and footer title lines and pages and page numbers. This information is located within the top and bottom margins of the printed page. If, for example, the system is used to prepare a long report, printer control markers would permit chapter headings to be printed automatically at the top of every page. A different control marker can be placed at the start of every section.

Also, the printer control parameters may be changed by including them within the printer control markers embedded within a document. Since these new changes will remain in effect, they must be rechanged to the original values when desired.

Typing 'ESC-O' will insert the following marker into the text.

---- Start Printer Control ----

The cursor stops after the Start Printer Control marker. Typing starts in column 1 and continues (64 characters maximum per line) until 'ESC-CTRL/O' is typed to end printer control.

---- End Printer Control ----

Printer control text (the text between the markers) is only meaningful when the document is being typed out. Printer control text is not included in determining page size during printout. Start and Stop Printer Control markers can be deleted with the delete keys.

The following Printer Control Commands can be used:

<HEADER (CR)	Text up to the next command will be included as a header.
<TRAILER (CR)	Text up to the next command will be included as a trailer.

These commands can occur within the Start and End Printer Control markers. The associated information will be substituted and used at that point. Ruler changes act normally. They continue to remain in effect until the next ruler change is made. Header and footer text can contain as many lines as the top and bottom margins specified in the Printer Control parameters. Only the first character of the commands need be typed. It must be in upper case

## HEADER Command

Typing '<HEADER (CR)' within the start and end printer control markers will cause the lines typed up to the next command to be used for the page header in the top margin reserved by the printer control parameters.

## TRAILER Command

Typing '<TRAILER (CR)' within the start and end printer control markers will cause the lines typed up to the next command to be used for the page trailer in the bottom margin reserved by the printer control parameters.

Printer control settings can be located anywhere in the text with the following exception. If L (lines per page) is changed using the Set Printer Control Command, that printer control must be at the top of the page of whose length must be changed (otherwise that setting doesn't go into effect until the next page).

During hard copy printing, the following actions occur in response to an 'ESC-N' (New Page) in the text.

1. Carriage returns are printed until it is time to print the trailer.
2. The header of the next page is not printed (instead three blank lines). The reason is that New Page is used mainly at the end of a chapter so the next page is the beginning of the next chapter and no header is used at the beginning of a chapter.

## Type Page Number Command

Typing '<N' within the start and end printer control markers will cause the current page number to be typed at that point.

## Type 'Less Than' Command

Typing '<<' will cause a '<' character to be typed at that point.

## Setting Printer Control Options Command

Typing '<SETTING (CR)' within the start and end printer control markers will cause the lines typed up to the next command to be used to change the printer control parameters. A printer control parameter is changed by specifying the letter of the printer control to be changed, an equal sign (=), and then the value of the parameter. If more than one parameter is to be changed, separate the specifications with a '/'. Type (CR) when finished. These new settings will remain in effect until changed by another printer control block.

Example

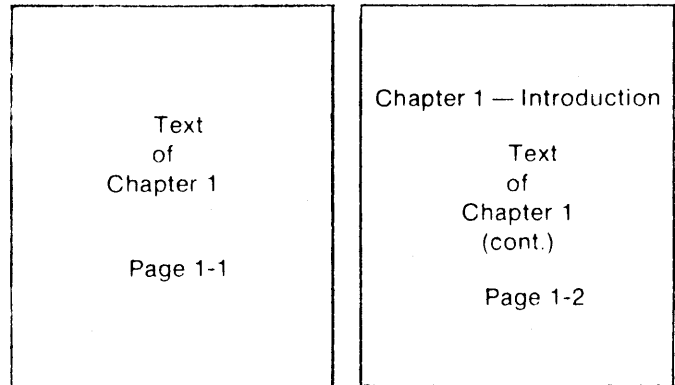
Setting (CR)  
L 50/C 1/D Yes (CR)

In the example, specifications for printer controls include 50 lines per page, current page starting number, and double spaced.

These printer controls would produce a series of pages as diagrammed in Figure 6-10.

Example of the Use Of Embedded Printer Control

Figure 6-8 gives an example of how the printer control commands would be used to type a heading on each page of a document. In the example, 'Chapter 1 Introduction' would be printed in the top margin of the document and 'page 1-N' (where N is the current page number), in the bottom margin. Figure 6-9 shows the printer control commands that would be used before the text of Chapter 2 to change the header to 'Chapter 2' and the trailer to 'page 2-N'. The 'C=1' command beneath the setting command resets the current page number to 1 in the printer control parameters.



```

----- Start Printer Control -----
<Header (cr)
Chapter 1 Introduction
<Trailer (cr)
Page 1 - <N
----- End Printer Control -----

(Text of chapter 1)
    
```

Figure 6-8

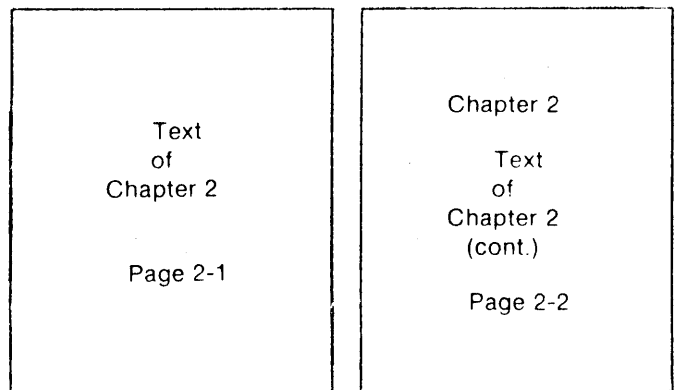


Figure 6-10.

```

(text at end of chapter 1)

----- New Page -----
----- Start Printer Control -----

<Header (cr)
Chapter 2
<Trailer (cr)
Page 2 - <N
<Setting (cr)
C=1
----- End Printer Control -----

(Text of chapter 2)
    
```

Figure 6-9

## Appendix A

### PRINTER INTERFACING

WOPROC originally comes ready to work with the Digital Group printer. In order to interface to other printers, the following information is needed for the handler:

1. The handler can be up to 4 pages long and starts at location 6000 (Octal).
2. Location 6000 is called to initialize the printer and line buffer (just return if no initialization is required). Location 6030 is called thereafter, with the desired letter/control character in register A. Please save all the registers (even IY).
3. Upon receiving this number in A, the handler should first test it to see if it is a control character, and if it is not, then put it into a line-buffer to be output when a carriage return (215) is received. The only control characters to worry about are carriage return and white spaces.
4. There are two kinds of flush-right justification. Space-oriented devices, like teletypewriters, require a "1" to be placed in location 30002. Column-oriented devices, like a dot-matrix printer, require the number of columns per space + 1 to be placed in location 30002 (the Digital Group Dot Matrix printer has 6 in location 30002).
5. If the handler receives any number less than 40, then that number of spaces (if space-oriented) or columns (if column-oriented) should be spaced upon printing the line.
6. If the MSB is high, then that character is to be printed expanded (only exception is carriage return, 215, which of course has to have MSB high to distinguish it from 15 columns of white space).
7. The pitch, in characters per inch, can be found in location 30013. If variable pitch is desired, then that location should be examined.

## READER'S COMMENTS

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