THE ELECTRIC PENCIL WORD PROCESSOR

Operator's Manual

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INTRODUCTION

The Electric Pencil is a Character Oriented Word Processing System. This means that text is entered as a continuous string of characters and is manipulated as such. This allows the user enormous freedom and ease in the movement and handling of text. Since lines are not delineated, any number of characters, words, lines or paragraphs may be inserted or deleted anywhere in the text. The entirety of the text shifts and opens up or closes as needed in full view of the user. The typing of carriage returns as well as word hyphenation is not required since each line of text is formatted automatically. As text is typed in and the end of a screen line is reached, a partially completed word is shifted to the beginning of the following line. Whenever text is inserted or deleted, existing text is pushed down or pulled up in a wrap around fashion. Everything appears on the video display screen as it occurs thereby eliminating any guesswork. Text may be reviewed at will by variable speed scrolling both in the forward and reverse directions.

By using the search or the search and replace function, any string of characters may be located and/or replaced with any other string of characters as desired. Specific sets of characters within encoded strings may also be located and used in creating selective mailing lists.

When text is printed, The Electric Pencil automatically inserts carriage returns where they are needed. Numerous combinations of Line Length, Page Length, Character Spacing, Line Spacing and Page Spacing allow for any form to be handled. Right Justification gives right-hand margins that are even. Camera ready copy is produced when a printer such as the Diablo HyTerm with variable horizontal spacing is used. Pages may be numbered as well as titled.

This manual was prepared using The Electric Pencil. Printing was done on a Diablo 1620 using a OCR-B printwheel and a carbon film ribbon. Line length was set to 75 characters across and page length was set to a maximum of 54 lines per page.

SYSTEM HARDWARE REQUIREMENTS

The following is a list of the minimum equipment that is required to
operate The Electric Pencil Word Processing System.

8080 or Z-80 Based Microcomputer
8K of memory starting at location 0000 (minimum)
Printer (Diablo HyTerm 1610/20, Selectric, TTY, etc.)
Printer to Computer Interface
Video Display Interface (VDM-1, SOL-20 or Polymorphic)
Video Display Monitor
Cassette Interface (Tarbell, SOL-20/SOLOS or CUTER)
Cassette Recorder
North Star Disk System (May replace or augment cassette)

The Electric Pencil Software is available in many versions. The version
selected depends on the hardware that is to be used with it. The
combinations are as follows:

Version	Printer	Video/Cassette Interface
SP	TTY, Selectric, etc.	Polymorphic/Tarbell
SS	TTY, Selectric, etc.	SOL-20 or VDM-1/CUTS
SV	TTY, Selectric, etc.	VDM-1/Tarbell
DP	Diablo HyTerm 1610/20	Polymorphic/Tarbell
DS	Diablo HyTerm 1610/20	SOL-20 or VDM-1/CUTS
DV	Diablo Hyterm 1610/20	VDM-1/Tarbell

The above versions are also available with provisions for interfacing with
the North Star Disk system. (Versions SPN, SSN, etc.)

USING THIS MANUAL

Knowing full well that instruction manuals can be rather tedious, this one
was assembled with ease of application as its main criteria. This text is
not intended to be a course but rather a guide to the proper operation of
The Electric Pencil Word Processing System. Within a few hours, anyone can
certainly start using The Electric Pencil and in less than a few days can
be expert at it. It is assumed that the reader is familiar with a standard
electric typewriter keyboard.

        THE BEST WAY TO LEARN TO OPERATE THIS SYSTEM IS TO USE IT !!!

Trying all the commands and experimenting with different combinations as
well as discovering the most efficient ways to do things will really pay
off. Speed will be directly proportional to previous typing ability.

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GLOSSARY
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Any words that may be new to the reader are included in this glossary.
Commonly used words that may have a special meaning in the context of word
processing are also included. Words that appear within definitions that
are also defined in the glossary are capitalized. If any of the text seems
vague while reading this manual, simply go back to the last point in the
text that was fully understood, read forward to the word that was not fully
understood, and look it up. Try it, it works!

BLOCK

Any amount of text as small as one CHARACTER or as large as an entire FILE.
A BLOCK may be a WORD or a sentence or a paragraph or a group of
paragraphs.

CHARACTER

Any letter, number, punctuation or symbol appearing on the VIDEO DISPLAY
SCREEN or keyboard.

CLEAR

The action of erasing or wiping out or deleting text from the face of the
VIDEO DISPLAY SCREEN or from the FILE AREA.

COMMAND

A CONTROL CHARACTER or normal letter CHARACTER that is used to tell The
Electric Pencil what to do.

CONTROL

A keyboard key that is used together with any letter key to create a
CONTROL CHARACTER.

CONTROL CHARACTER

A keyboard key used with the CONTROL key to tell The Electric Pencil what
to do.

CURSOR

A solid white block which appears on the VIDEO DISPLAY SCREEN and is used
to indicate the CHARACTER or space about to be typed, moved, inserted or
deleted.

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DEFAULT VALUE

A PRINT VALUE assumed by The Electric Pencil whenever no value is specified by the user.

DELETE

The process of removing a CHARACTER, a space, a line or a BLOCK of text from the VIDEO DISPLAY SCREEN.

FILE

The entirety of text that has been entered onto the VIDEO DISPLAY SCREEN and subsequently into the memory of The Electric Pencil. All the text resident within the system at any given time is called a FILE.

FILE AREA

The area in memory that has been reserved for the FILE. When The Electric Pencil is first turned on, this area is automatically determined by the system by examining all available contiguous (adjoining) memory and claiming it. Whenever the FILE AREA is full, the message "FILE AREA FULL" will appear on the screen.

JUSTIFICATION

The process of adjusting spaces within a line of text in order to create an even right-hand margin.

PAGE

Sixteen lines of text appearing on the VIDEO DISPLAY SCREEN. May be any number of lines of text when referring to a printed PAGE.

PAGENATION

The process of automatically numbering pages.

PRINTER

An electric typewriter that prints text from The Electric Pencil FILE AREA onto paper.

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PRINT VALUE

A value assigned to a printing function by the user or by the system. This value will determine Line Length, PAGE Length, Line Spacing, etc.

READ

The action of moving a FILE from a cassette tape and inserting it into the FILE AREA. ("Playing" a tape into the computer)

RECORD

Any BLOCK of text that is terminated by a LINE FEED or a FORM FEED. A RECORD may be as short as one CHARACTER or as long as the entire FILE. A RECORD is most nearly like a paragraph.

SCROLL

The action of the text moving up or down the VIDEO DISPLAY SCREEN. More than 16 lines of text (one PAGE) must exist in the FILE for this action to occur.

STRING

Any consecutive grouping of letters, spaces, numbers, punctuation or symbols. In this system, a STRING may be anywhere from 1 to 40 characters long.

VIDEO DISPLAY SCREEN

The electronic display unit of The Electric Pencil. Also called a CRT (Cathode Ray Tube) or monitor or simply screen. It may also be the face of a television set.

WORD

Any amount of characters with at least one space at either end. A WORD may be as short as one CHARACTER or as long as one line.

WRITE

The action of moving text from the FILE AREA and recording it onto cassette tape. ("Recording" a tape from the computer)

GETTING STARTED

Whenever The Electric Pencil is entered for the first time or the system is cleared, the video display screen will display:

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Depressing any key on the keyboard will clear the screen and the character that was typed will appear in the HOME or upper left-hand corner of the screen. A file may now be started by typing in whatever text is desired. Note that RETURN is not used at the end of a line and that any partially completed word that doesn't fit on the line will be brought down to the next line. Typing can proceed normally until the end of a paragraph is reached. At this point a LINE FEED should be typed to terminate the paragraph or record. Any additional LINE FEEDS will insert blank lines after the record. If this is to be the end of a page, a FORM FEED is typed. Before continuing with this manual, the user is advised to try this in order to get a "feel" of how text is entered into The Electric Pencil file area.

It is recommended that sentences begin at the extreme left margin since indentation can not be guaranteed unless a line is terminated by a LINE FEED. Whenever a specific number of spaces within a line are essential, the line must be terminated by a LINE FEED. This is because lines are not delineated and may be broken up at any point during printing. Exactly where a line will end is determined by the line length that is selected by the user just prior to printing. However, by assuming manual control of The Electric Pencil during printing, indentation is possible.

Experimentation and imagination will bring about almost any desired results in the final printing of text.

COMMANDS AND FUNCTIONS

NOTE: Control Character Commands require that the CONTROL key and the
specified alphabetic character key be depressed simultaneously. Control
Character Commands (with the exception of LINE FEED and FORM FEED) will not
appear on the video display screen. In this text, all references to Control
Character Commands shall be designated by enclosing them in parenthesis,
e.g. (A), (B). Standard keyboard characters when referenced shall be
enclosed in brackets, e.g. [A], [B], [5], etc.

COMMAND	FUNCTION	SOL-20 NOTES
(A)	CURSOR LEFT	Left arrow may also be used
(S)	CURSOR RIGHT	Right arrow may also be used
(W)	CURSOR UP	Up arrow may also be used
(Z)	CURSOR DOWN	Down arrow may also be used
(Q)	CURSOR HOME	Use (N) or HOME
(N)	CURSOR to END of FILE	Use (Q)
(B)	CURSOR TO BEGINNING of FILE	
(E)	SCROLL UP (Forward)	
(X)	SCROLL DOWN (Backwards)	
(D)	DELETE CHARACTER	
(F)	INSERT CHARACTER	
(Y)	DELETE LINE	
(G)	INSERT LINE	
(T)	ERASE to END of LINE	
(U)	DELETE BLOCK	
(H)	INSERT BLOCK	
(J)	Same as LINE FEED	
(L)	Same as FORM FEED	
(I)	Same as TAB	
(M)	Same as RETURN	
(V)	STRING SEARCH	
(C)	CONTINUE SEARCH	
(R)	REPEAT FUNCTION	
(K)	SUB-SYSTEM COMMAND TABLE	
(P)	PRINT	
(O)	EXIT SYSTEM	Jumps to SOLOS or CUTER
CONTROL	CREATE CONTROL CHARACTER	
DELETE	BACKSPACE and ERASE CHARACTER	
ESCAPE	RETURN to MAIN SYSTEM	
FORM FEED	TERMINATE a PAGE	
LINE FEED	TERMINATE a RECORD	
RETURN	CURSOR to BEGINNING of LINE	
TAB	CURSOR 8 SPACES to the RIGHT	

CONTROL CHARACTERS were selected for location and convenience rather than
significance as shall be discussed.

CURSOR MOTION COMMANDS

Notice that the most often used Cursor Motion Command keys are clustered at the left of the keyboard. The keys that move the cursor UP and DOWN, and to the LEFT and RIGHT form a diamond that conveniently points in these directions. The (Q) in the upper left hand corner represents HOME, which is also the upper left corner of the video display screen.

MOVING THE CURSOR TO THE BEGINNING AND END OF FILE

The (B) and (N) are not as heavily used as the above cursor commands and therefore are not located in the same area. (B) returns the cursor to the beginning of the file and (N) moves the cursor to the end of the file.

```
HOME  (Q)              (W) UP            (E)  SCROLL UP

                        /\
                       /  \
                      /    \
      LEFT  (A)      /      \  (S)  RIGHT
                     \      /
                      \    /
                       \  /
                        \/

               (Z)  DOWN          (X)  SCROLL DOWN
```
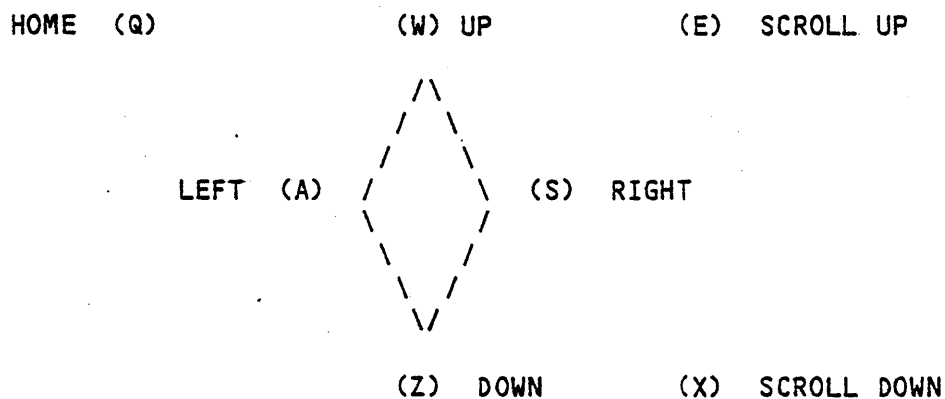
SCROLLING AND DISPLAY CONTROL

SCROLLING is the action of the text moving up or down the video display screen. More than 16 lines of text (one page) must exist in the file for this action to occur. The (E) and (X) keys scroll the screen up and down respectively. The cursor will disappear from the screen during a scroll. Scrolling speed may be controlled by typing the numerals [1] through [5] while scrolling. [1] is the fastest speed, and [5] is the slowest. Further control is provided by the SPACE BAR, which temporarily halts the scroll. Continued depressions of the SPACE BAR will scroll one line at a time in the direction previously selected. The RETURN key will continue the scroll after it has been halted by the SPACE BAR. Whenever the end of the file is reached or when ESCAPE is used, the scroll will stop completely; the cursor will re-appear on the screen, and total system control will return to the user.

DELETE CHARACTER

(D) is used to delete a character that exists in a body of text. The cursor is simply placed over the character to be deleted, and (D) is typed. The entire text then moves towards the cursor one position. Multiple deletions are also possible from any location by deleting one character or space at a time.

INSERT CHARACTER

The Electric Pencil is normally in an over-write mode. This means that any character typed will appear wherever the cursor is located. If there is already a character at the current cursor position, the new character typed will replace the existing one. By typing (F), the Insert Mode is entered. The cursor itself will change in its appearance to warn the user that the system is now in Insert Mode. The manner of change will depend upon the equipment that is used with The Electric Pencil. While in the Insert Mode any character typed will automatically shift the entire text to the right and insert the new character into the cursor position. Typing (F) or leaving the current line will exit the Insert Mode and the cursor will assume its normal form. When the end of a line is reached, while in the Insert Mode (or even while in the normal over-write mode), an entire line will be opened up to allow for additional character insertion. If a line is only partially filled, (D) will pull up the rest of the text to the cursor. Doing the above actions will demonstrate more clearly what actually happens far better than this manual can.

DELETE LINE

(Y) will delete whatever line the cursor is currently on.

INSERT LINE

(G) will move the line that the cursor is currently on down one and the cursor will assume a position at the beginning of that line. Text may now be typed in as needed and when the end of the line is reached, another (G) will automatically be entered by the system allowing the user to continue entering text without interuption.

ERASE TO END OF LINE

(T) erases all text from the current cursor position to the end of the current line.

BLOCK MOVEMENT

A block is defined as any amount of text as small as one character or as
large as an entire file. It may be a word or a sentence or a paragraph or
a group of paragraphs. In order to move a block of text to another part of
the file or to delete a block of text, it must first be marked. The
character used to mark the boundaries of a block is [\]. This character is
also called a "marker". To mark the boundaries of a block, the cursor is
placed over the first character of the text desired and then the [\] key is
depressed. The action will be the same as if the Insert Mode was entered.
The text will shift right and the "marker" will be placed. The cursor
should now be moved to one character beyond the end of the block of text
desired and similarly marked. Exactly two markers must be used; otherwise,
a MARKER ERROR message will appear on the video display screen when a move
is attempted. ESCAPE is used when this occurs to return to the system so
that the user can place the markers correctly. Markers may be deleted
using the search function. Markers are automatically deleted during a
block delete. Markers should not be placed after a LF character on the
screen. Instead, place the marker at the beginning of the following line.
This will prevent the appearance of two markers on the screen.

DELETE BLOCK

(U) will delete a block that has been correctly marked as stated above.
The block markers are also deleted during this action. If a block is
incorrectly marked or not marked at all, "MARKER ERROR" will appear on the
video display screen.

INSERT BLOCK

(H) is used to insert a correctly marked block at any selected cursor
position and may be repeated as often as desired. "MARKER ERROR" will
appear on the video display screen if an attempt is made to move a block
into itself or if more or less than two markers exist in the file.

LF, FF, TAB and RETURN

LF [LINE FEED] is used to terminate a record or to place an empty line
between records. FF [FORM FEED] is also used to terminate a record, but
when it is encountered during printing, the printer will advance the paper
to the top of the next page. TAB may be used as an "express" key to
quickly move across the screen as well as its normal function of tabbing 8
spaces to the right. RETURN moves the cursor to the beginning of the
current line and also terminates commands in the sub-system command table.

STRING SEARCH

The search function is used to locate any string of characters that may
exist in the file from the current cursor position to the end of the file.
(V) clears the video display screen and then displays:

SEARCH STRING?

The character string desired followed by a RETURN is then typed in by the
user. The maximum string length is 40 characters. The first occurence of
the string from the cursor position forward will appear as the top line on
the video display screen. The search may be continued by typing control
character (C). Each subsequent "find" will also appear as the top line on
the screen. When the end of the file is reached or the string no longer
exists in the file,

CAN NOT LOCATE "String"

will appear on the video display screen. This function is used to quickly
locate selected areas within a file.

SEARCH and REPLACE

This function is used to locate a string and replace it with another
string. The old and new strings may be of different lengths. The way this
is handled is as follows:

SEARCH STRING? Old string/New string/12

followed by a RETURN. 12 represents the number of times that the
replacement is to occur and may be any decimal number. In the event that
"Old string" only appears 8 times in the text (from the current cursor
position), the screen will clear and display:

LOCATED "Old string" 8 TIMES

The actual replacement will have been made 8 times. If "Old string" occurs
12 or more times in the text, 12 replacements will be made and the cursor
will return to the file. All occurences of "Old string" can be replaced by
typing a number greater than the possible occurences of "Old string" at the
end of the reply to the SEARCH STRING? question. For example:

SEARCH STRING? Mr. Jones/Mr. Smith/9999

The system will respond with:

LOCATED "Mr. Jones" 14 TIMES

Assuming "Mr. Jones" appears only 14 times in the text.

CODED STRING SEARCHES

Strings may be also located where only a certain pattern is required. Assuming a file consists of names and addresses of clients with a code prefix as follows:

WS1234HP
Tom Jones
15 E. 94th St.
New York, N.Y. 10028

WP1235LP
Bill Smith
3800 Wilshire Blvd.
Los Angeles, CA. 90016

WS6784HL
Elmer Brown
300 N. Vermont
Los Angeles, CA. 90028

SEARCH STRING? WS###4H

will locate Tom Jones. Typing a control character (C) will then locate Elmer Brown. Note that [#] is a "don't care" character. Using this function, a selected mailing list can be produced. Other uses might include lists of sales prospects with action dates to represent appointments, expirations, service dates, etc. Data can be selectively extracted from a file automatically using the coded string search function.

REPEAT FUNCTION

Most functions may be repeated any number of times as per the following examples:

(R)[5](D)   will delete 5 characters.

(R)[22][.]   will type 22 periods.

(R)[3](P)   will print 3 times.

The cursor will disappear whenever (R) is typed and will return after the number of repeats are performed. In the event of a typing error, the cursor will return and nothing else will happen. This three part command is not visible on the screen.

SUB-SYSTEM COMMAND TABLE

Within The Electric Pencil is a Sub-System Command Table that permits implementation of additional commands as well as the setting up of Print Values. (K) clears the video display screen and displays the Sub-System Command Table as follows:

(Not displayed on disk versions)	TAPE READER	R
(Not displayed on disk versions)	TAPE WRITER	W
(Not displayed on disk versions)	TAPE VERIFY	V
	WORD NUMBER	X
	RCRD NUMBER	Y
(Disk versions only)	DISK DRCTRY	DI
(Disk versions only)	SAVE DSKFIL	DS
(Disk versions only)	LOAD DSKFIL	DL
	CLER AA CUR	CAA
	CLER AB CUR	CAB
	CLER SYSTEM	CLR
	RGHT JUSTFY	J0-1
	LINE SPACNG	S1-5
(Diablo Versions only)	CHAR SPACNG	H8-50
(Standard Versions only)	PAGE SPACNG	A2-20
	PAGE LENGTH	G1-72
(SOL-20 and disk versions only)	LEFT MARGIN	M0-100
	PAGE NUMBER	N1-255
	PRNT LENGTH	P0-255
	LINE LENGTH	L25-125

While in this mode, the standard keyboard keys are used alone without the CONTROL key. The above commands are NOT Control Character Commands.

When these commands are referenced in this text, they shall be enclosed in brackets, e.g. [A], [B], [5]. All commands must be terminated with RETURN. The DELETE key is used to backspace, and the ESCAPE key is used to leave the sub-system. Command entry errors are indicated with a question mark "?" on the video display screen. Note that some of the functions are abbreviated on the screen.

[R] TAPE READER

To enter a file that is on cassette tape into the file area of The Electric Pencil, first depress the Tape Reader command [R], then run the cassette recorder to a little before the file starts on the tape, press the cassette recorder play button, and then hit RETURN. The cursor will disappear from the screen and reading will begin. When the file has been correctly read into memory, "READY" will appear on the screen. If there is an error in the tape, "TAPE ERROR" will appear. When a file is read into The Electric Pencil, it is normally placed at the end of any material that may already exist in the file area. If this is to be a new file, the file area should

be cleared. See [CLR], [CAA] and [CAB]. If the incoming file is too long
for the existing memory, "FILE AREA FULL" will appear on the screen. The
partially loaded file will then be removed from the file area with no
damage to the current file, if any. SOL-20/CUTER versions only: Files may
be also called by name per the SOLOS/CUTER format. Typing R SAMPL/2 will
start cassette unit 2, search for the file "SAMPL" and place the file into
the file area when it is found. A file name may be up to 5 characters long
and the default value of the tape unit is 1. Addresses are not used.

[W] TAPE WRITER

To write a file onto cassette tape, first place the cursor to the position
in the file from which you wish to write. If the entire file is needed,
then (B) should be used to place the cursor at the beginning of file. (K)
will then bring up the Sub-System Command Table. Depress [W], start the
cassette recorder in Record mode at a convenient location on the tape, let
the tape run for 3-5 seconds and hit RETURN. The cursor will disappear and
writing will begin. When the file has been recorded onto tape, "WRITTEN"
will appear on the screen. Stop the recorder, rewind to a little before
the location where the writing started and VERIFY. When working with
lengthy text, it is advisable to periodically write the file onto tape as a
precaution against power failures which can destroy all material in the
file area as well as The Electric Pencil itself. SOL-20/CUTER versions
only: Files may be named per the SOLOS/CUTER format. Typing W PENCL/1
will start cassette unit 1 and the system will then proceed to write a
standard file header followed by the file itself. The file will be a type
D for Data file and not executable. File tapes may be scanned for content
using the CA command in SOLOS.

[V] TAPE VERIFY   TARBELL VERSIONS ONLY

[V] is basically the same as [R] except the file is not placed into the
file area. It is, however, checked for correctness, and returns with
"VERIFIED" if the tape is correct or with "TAPE ERROR" if it is not. A
tape just written showing "TAPE ERROR" should be re-written with [W].
Continual tape errors indicate faulty tape or a faulty cassette recorder.

[X] WORD NUMBER

[X] will return the number of words that are in the file from the current
cursor position. A word is defined as any amount of characters with at
least one space at either end. A word may be as short as one character or
as long as one line.

[Y] RECORD NUMBER

[Y] will return the number of records that are in the file from the current
cursor position. A record is defined as any block of text that is

terminated by a LINE FEED or a FORM FEED (L). A record may be as short as
one character or as long as the entire file. A record is most nearly like
a paragraph.

[DI] DISK DIRECTORY

[DI] followed by a carriage return will list all the files on the currently
loaded diskette. The file names and the number of 256 byte sectors
(length) will be displayed in two columns on the left side of the screen.
The command table on the right side remains intact. (During any disk
operation the left portion of the screen is used for display without
disturbing the command table). Since two columns are used, up to 32 files
can be displayed simultaneously.

[DIP] PRINT DISK DIRECTORY

This command is identical to the DISK DIRECTORY command, but the printer is
used instead of the video screen, so that a hard copy listing of the disk
files may be created. (This command is not shown on the sub-system command
table on the screen).

[DS] SAVE DISK FILE

To write a file from memory to disk, type [DS] followed by a space and a
name. The name must start with a number or upper or lower case letter. Any
number of upper or lower case characters, numbers or punctuation marks
(except spaces) may be used in the name field, but only the first 8 will be
kept. When the carriage return is pressed, the cursor will disappear and
the disk will start. When writing is complete, the disk directory will be
written on the screen. The file is automatically read from disk and
checked for accuracy during the writing process, therby assuring that no
errors have occured. During the writing process, the length of the file is
computed, the file type is set (type 4), the disk is checked to determine
that the name does not already exist, the disk is checked to assure that
sufficient space exists on the disk, the directory entry is created, and
the file is written onto the disk. If the name already exists and the type
is correct (type 4), the file is written over the existing disk file (the
length of the disk file is increased if necessary). If there is not
sufficient space on the disk, a check is made to determine if there would
be enough space if the disk were compacted. If there would be, the disk is
automatically compacted and the file is written. If any of the above tests
fail, an appropriate error message is placed on the screen.

[DL] LOAD DISK FILE

To load a file that is on disk into the file area of The Electric Pencil,
first load the proper disk into the disk drive unit and close the retaining
door. Enter the command [DL] followed by a space and the name of the file
to be loaded. When the carriage return is depressed, the disk drive unit
will start and the file will be loaded. When the file is correctly loaded
into memory, "READY" will appear on the screen. If an error occurs
(usually a misspelled file title) an error message will appear at the
bottom of the screen. When a file is read into The Electric Pencil, it is
placed at the end of any material that may already exist in the file area.
If this is not desired, the file area should be cleared before loading. If
the file is too long for the existing memory, the error message "NO SPACE"
will appear on the screen.

[DK] KILL DISK FILE

[DK] followed by a space and a file name will delete a disk file from the
disk directory, duplicating the North Star DE command function. This
command can be used to delete any named file on the diskette, regardless of
file type. As with the North Star version, the file on the disk is not
affected, only the directory. (This command is not shown in the sub-system
command table on the screen).

DISK SYSTEM ERROR MESSAGES

Most errors that occur during disk operation are caused by incorrect
command formatting, usually referred to as "Syntax Errors". Every effort
has been made to be more specific in identifying errors, thus an extensive
list of error messages has been included. However, there will still be
times when the innocuous "Syntax Error" will appear on the screen,
requiring the operator to determine the true cause. The following list of
messages are included in the system:

         DISK ERROR, DRIVE ( ), SECTOR ( )
         FILE TYPE ERROR
         FILE NOT FOUND
         NO SPACE
         WRITE PROTECTED
         DIRECTORY FULL
         IMPROPER NAME
         NO FILE

CLEARING COMMANDS

The following clearing commands require three characters to be entered by
the user as a precaution against accidental destruction of the file area.
These commands should be used with caution since any material in the file
area cannot be retrieved once it has been erased. Back-up copies of text
should always be made of files before text is cleared.

[CAA] CLEAR ALL AFTER CURSOR

[CAA] will clear all text in the file from the cursor position just prior
to entering the Sub-System to the end of the file. Upon completion, the
Sub-System is aborted and normal operation is resumed.

[CAB] CLEAR ALL BEFORE CURSOR

[CAB] will clear all text in the file from the cursor position just prior
to entering the Sub-System to the beginning of the file. The character
under the cursor will not be cleared. Upon completion, the Sub-System is
aborted and normal operation is resumed.

[CLR] CLEAR SYSTEM

[CLR] will clear the entire file area as well as reset all PRINT VALUES to
their DEFAULT VALUES. The video display screen will clear and display:

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[CLR] as well as [CAA] and [CAB] should be used with care.

SETTING UP PRINT VALUES

The following PRINT VALUES are automatically set to DEFAULT VALUES when The
Electric Pencil is first entered or when [CLR] is used. Whenever a command
is entered without a value and is followed by a RETURN, the system assumes
the DEFAULT VALUE for that command.

[J] RIGHT JUSTIFY   DEFAULT VALUE=0

[J0] (zero) sets the system to print as many characters on a line as will
fit without justifying the right-hand margin of the text. [J1] tells the
system to calculate the number of characters in a line and expand the text
so that the right-hand margin is justified (even). The Selectric versions
do this by inserting additional blank spaces between words, while the
Diablo version actually spreads out the spaces between characters.
Hyphenation is normally not required using [J1].

[S] LINE SPACING   DEFAULT VALUE=1

[S1] through [S5] sets the amount of blank lines between text lines that
will appear in printing (single spacing, double spacing, etc.).

[H] CHARACTER SPACING   DEFAULT VALUE=10

Diablo versions only: [H8] through [H50] sets the amount of space between
characters during printing. The values of [H] are what is called HMI
(Horizontal Motion Index) in the Diablo Product Description Manual.

[A] PAGE SPACING   DEFAULT VALUE=12

Standard printer versions only: [A2] through [A20] sets the amount of
spaces (empty lines) between pages during printing. This function is
handled mechanically on the Diablo versions.

[G] PAGE LENGTH   DEFAULT VALUE=54

[G1] through [G72] sets the amount of lines of text that will appear on a
page during printing. An empty line also counts as a line of text.

[M] LEFT MARGIN   DEFAULT VALUE=0

SOL-20/CUTER and North Star versions only: [M0] through [M100] sets the
position of the left margin. This value added to LINE LENGTH must not
exceed the carriage width of the printer. Diablo versions only: The
sub-system command table will not accept values for LEFT MARGIN or LINE
LENGTH that will allow the sum of these two values to exceed 125.

[N] PAGE NUMBER   DEFAULT VALUE=1

[N1] through [N255] sets the first page number to be used during printing.
This assumes that pagenation has been set up. The highest page number
available is 255 and then the system resets to 0, 1, 2, etc.

[P] PRINT LENGTH   DEFAULT VALUE=0

[P0] enables printing of all the text from the cursor position to the end
of the file. [P1] through [P255] sets the number of records that will be
printed from the cursor position onward.

[L] LINE LENGTH   DEFAULT VALUE=62

[L25] through [L125] sets the number of characters per line of text that
will be printed. Using justification, the number of actual characters per
line will vary but the over-all character width of the line will be the
value selected. At the DEFAULT VALUE, the line length will be the same as
that which appears on the video display screen, and if justification is not
selected, the text will be printed exactly as it appears on the screen.
Diablo versions only: The sub-system command table will not accept values
for LEFT MARGIN or LINE LENGTH that will allow the sum of these two values
to exceed 125.

PRINTING

(P) commands The Electric Pencil to start printing text from the current
cursor position forward. The amount of text that will be printed is
governed by the setting of Print Length [P] in the sub-system. The format
that the printed page will assume is determined by the Print Values set up
by the user prior to printing. Printing may be repeated in order to obtain
multiple copies of text by using the Repeat Command (R). The print head of
the printer will print forwards and backwards in the Diablo version while
the Selectric versions will print forward only. SOL-20/CUTER versions
only: The Electric Pencil uses the I/O ports selected by SOLOS/CUTER for
its keyboard and printer. Output pseudo port 0 is ALWAYS the video display
screen and if it is selected as the output device, PRINTING WILL NOT
OCCUR!!! Use SE 0=1, 2 or 3 to select the printer. I/O should be set just
prior to entering The Electric Pencil.

PRINTING with a DIABLO

The Form Length switch on the Diablo Hy-Type II should be set to the
desired form size. The paper is then manually advanced to the top of form
and the SET TOF switch is then depressed. Additional information on how
this is accomplished will be found in the Diablo Manual. The cursor is
then placed over the first character of text desired, and (P) is typed.
Printing will begin. Printing may be controlled by using the SPACE BAR,
RETURN and ESCAPE as in scrolling.

PRINTING with a SELECTRIC, TTY, ETC.

Page Spacing [A] in the sub-system will determine the number of lines
between pages. The paper is manually advanced to the top of form desired.
This position will be where printing will actually start on the paper. The
cursor is then placed over the first character of text desired, and (P) is
typed. Printing will begin. Printing may be controlled by using the SPACE
BAR, RETURN and ESCAPE as in scrolling.

TITLING PAGES and PAGE NUMBERING

Pages may have title headings as in this manual by entering the following
information at the beginning of the file onto the video display screen:

$This is a Sample Title Heading [LF]

Note that in the above example a dollar sign [$] MUST precede the title and
a LINE FEED MUST be typed after the title text. In order for the title to
appear in printing as a title, printing MUST start with the cursor directly
over the dollar sign [$]. Otherwise, the title will be printed as regular
text. If the title length is greater than the Line Length [L] minus 10
selected in the sub-system, the title text will appear on the printed page
as regular text. Whenever a title heading is used, pages will be
automatically numbered at the extreme top right of each page as they appear
in this manual. If only page numbering is desired without a page title,
only the dollar sign [$] immediatly followed by a LINE FEED is used.
Printing must also begin directly over the [$]. In the course of printing,
title headings may be changed by placing additional title headings (using
the above form) into the text. The Electric Pencil will recognize these
ONLY if they appear directly after a FORM FEED (L). The new title heading
will then appear on all subsequent pages till the end of printing, unless
still another title is inserted after a FORM FEED. Page numbering will
remain sequential throughout. The starting page number will always be 1
unless set otherwise in the sub-system.

UNDERLINING

Words or phrases may be underlined ONLY in lines shorter than 62 characters
and terminated by a LINE FEED. Underlining is not permissable within
justified text. Text is underlined by entering the following onto the
video display screen:

THIS IS A TEST [LF]   will print: THIS IS A TEST
_____ [LF]   _____

This is a NEW test [LF]   will print: This is a NEW test
          ___ [LF]   ___

The above examples apply to the Diablo versions ONLY. On a Selectric, TTY,
etc., the above form is reversed. The underline goes on the top and the
text goes directly below it.

EXIT SYSTEM

(O) is used to exit The Electric Pencil and go to a different location within the computer. This location is presently set at 0E000H (0E900H in North Star versions), but may be patched to any location desired. See the patch locations section of this manual. If there isn't anything located at 0E000H, DO NOT use this command. It will destroy The Electric Pencil and its file area. Should this occur, re-loading the system will be required. SOL-20/CUTER versions only: (O) exits The Electric Pencil and returns system control to SOLOS/CUTER. North Star versions only: (O) exits The Electric Pencil and re-boots the North Star DOS at 2000H. This action destroys any file in the Electric Pencil and should be used with care. It is advisable to save files with [DS] prior to using this command.

LOADING THE ELECTRIC PENCIL (SOL-20/CUTER VERSIONS)

Use the SOLOS/CUTER commands XE PENCL or GE PENCL to load The Electric Pencil. If GE PENCL is used, then EX 0 will start the program. XE PENCL will automatically load and start the program. The screen will clear and The Electric Pencil will sign on. A good idea is to select the print device just prior to entering The Electric Pencil. The only patch locations that may be needed are 0B40H (Ver. SS) or 0B25H (Ver. SSN) which is the number of printer nulls required (currently set to 0), and 0B3EH (Ver. SS) or 0B23H (Ver. SSN) which is the null character (currently set to 0).

LOADING THE ELECTRIC PENCIL (TARBELL CASSETTE)

The cassette interface input routine supplied with the Tarbell Cassette Interface must be used. The starting address is 0000H and the block length is 1000H. A proper load is indicated by a 'G' appearing on the terminal. The computer is then reset, and The Electric Pencil will sign on. If this doesn't occur, some patches may be required to allow The Electric Pencil to operate with your system. Information as to specifically what patches to make for your system may be obtained from the source where you purchased your tape. The following pages contain the patch locations that may be required.

LOADING NORTH STAR DISK VERSIONS

North Star versions are furnished on diskette. The Electric Pencil is
configured as a type 1 (GO) file. The Electric Pencil contains its own
disk operating system and the standard DOS is destroyed after loading.
This is necessary to conserve memory. The Electric Pencil resides from
memory locaton 0 to about 1800H, with memory from 1800H to 2280H reserved
for scratchpad and for disk compacting operations. The file area is above
2280H to the end of memory. Type GO PENCIL to load and run The Electric
Pencil. If the program doesn't sign on, some patches may be required to
operate with your system. Refer to the following pages for the patch
locations for your version of The Electric Pencil.

REGISTRATION

Please fill out the registration form that appears on the last page of this
manual so that your name will be placed on a mailing list to receive
information of any up-dates as well as improvements to The Electric Pencil.
Happy Word Processing !!!

```
ADDR B1 B2 B3 B4 B5 EROR LINE            PATCH LOCATIONS    VER.SV

0000                     0001 ;
0000                     0002 ;        THE ELECTRIC PENCIL WORD PROCESSOR
0000                     0003 ;                      WITH
0000                     0004 ;            STANDARD PRINT PACKAGE
0000                     0005 ;
0000                     0006 ;        VER. SV    REV Ø    VDM-1    MAY 1977
0000                     0007 ;        COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                     0008 ;             ALL RIGHTS RESERVED
0000                     0009 ;
0000 00 00               0032        DW      Ø              RESERVED FOR USER
0002 00 00               0033        DW      Ø              INITIALIZATION OF
0004 00 00               0034        DW      Ø              I/O BOARD SUCH AS
0006 00 00               0035        DW      Ø              IMSAI SIO-2, ETC.
0008 00 00               0036        DW      Ø
000A 00 00               0037        DW      Ø
0019                     0046 ;
0019 C8                  0047        DB      CTRL           VDM CONTROL PORT
0082                     0098 ;
0082 7F                  0099        DB      RUB            DELETE CHARACTER
011D                     0167 ;
011D 00 EØ               0168        DW      MONI           SYSTEM MONITOR
07C1                     1054 ;
07C1 7F                  1055        DB      RUB            DELETE CHARACTER
091D                     1240 ;
091D 1B                  1241        DB      ESC            ESCAPE CHARACTER
0922                     1246 ;
0922                     1247 ;        KEYBOARD INPUT ROUTINE
0922                     1248 ;
0922 DB 00               1249 STATS   IN      STAT           GET KEYBOARD STATUS
0924 E6 Ø1               1250         ANI     DAV            MASK STATUS BIT
0926 C2 22 09            1251         JNZ     STATS          MAY NEED JZ HERE
0929 C9                  1252         RET
092D DB Ø1               1256 INP8    IN      DATA           GET KEYBOARD DATA
092F E6 7F               1257         ANI     127            STRIP PARITY BIT
0931 C9                  1258         RET
0932                     1259 ;
0932                     1260 ;        PRINTER OUTPUT ROUTINE
0932                     1261 ;
0932 F5                  1262 OUT8    PUSH    PSW
0933 DB 00               1263         IN      STAT           GET PRINTER STATUS
0935 E6 80               1264         ANI     TBE            MASK STATUS BIT
0937 C2 33 09            1265         JNZ     OUT8+1         MAY NEED JZ HERE
093A F1                  1266         POP     PSW
093B D3 Ø1               1267         OUT     DATA           OUTPUT TO PRINTER
093D C9                  1268         RET
09FF                     1371 ;
09FF 1B                  1372         DB      ESC            ESCAPE CHARACTER
0B3B 00                  1529         DB      Ø              NULL CHARACTER
0B3D 00                  1533         DB      Ø              NUMBER OF NULLS
ØDEC 00 CC               1756 BASE    DW      ØCCØØH         VDM MEMORY ADDRESS
```

```
0000                        0001 ;
0000                        0002 ;    THE ELECTRIC PENCIL WORD PROCESSOR
0000                        0003 ;                    WITH
0000                        0004 ;         STANDARD PRINT PACKAGE
0000                        0005 ;
0000                        0006 ;    VER. SP   REV Ø   POLY    MAY 1977
0000                        0007 ;    COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                        0008 ;          ALL RIGHTS RESERVED
0000                        0009 ;
0000 00 00                  0031       DW       Ø          RESERVED FOR USER
0002 00 00                  0032       DW       Ø          INITIALIZATION OF
0004 00 00                  0033       DW       Ø          I/O BOARD SUCH AS
0006 00 00                  0034       DW       Ø          IMSAI SIO-2, ETC.
0008 00 00                  0035       DW       Ø
000A 00 00                  0036       DW       Ø
007F                        0091 ;
007F 7F                     0092       DB       RUB        DELETE CHARACTER
011A                        0160 ;
011A 00 EØ                  0161       DW       MONI       SYSTEM MONITOR
07C5                        1051 ;
07C5 7F                     1052       DB       RUB        DELETE CHARACTER
0924                        1239 ;
0924 1B                     1240       DB       ESC        ESCAPE CHARACTER
0929                        1245 ;
0929                        1246 ;    KEYBOARD INPUT ROUTINE
0929                        1247 ;
0929 DB 00                  1248 STATS IN       STAT       GET KEYBOARD STATUS
092B E6 01                  1249       ANI      DAV        MASK STATUS BIT
092D C2 29 09               1250       JNZ      STATS      MAY NEED JZ HERE
0930 C9                     1251       RET
0934 DB 01                  1255 INP8  IN       DATA       GET KEYBOARD DATA
0936 E6 7F                  1256       ANI      127        STRIP PARITY BIT
0938 C9                     1257       RET
0939                        1258 ;
0939                        1259 ;     PRINTER OUTPUT ROUTINE
0939                        1260 ;
0939 F5                     1261 OUT8  PUSH     PSW
093A DB 00                  1262       IN       STAT       GET PRINTER STATUS
093C E6 80                  1263       ANI      TBE        MASK STATUS BIT
093E C2 3A 09               1264       JNZ      OUT8+1     MAY NEED JZ HERE
0941 F1                     1265       POP      PSW
0942 D3 01                  1266       OUT      DATA       OUTPUT TO PRINTER
0944 C9                     1267       RET
0A06                        1370 ;
0A06 1B                     1371       DB       ESC        ESCAPE CHARACTER
0B44                        1529 ;
0B44 00                     1530       DB       Ø          NULL CHARACTER
0B46 00                     1534       DB       Ø          NUMBER OF NULLS
0B47                        1535 ;
0DF5 00 CC                  1758 BASE  DW       ØCCØØH     POLY MEMORY ADDRESS
```

ADDR	B1	B2	B3	B4	B5	EROR	LINE						

```
ADDR B1 B2 B3 B4 B5 EROR LINE          PATCH LOCATIONS    VER. DV

0000                     0001 ;
0000                     0002 ;    THE ELECTRIC PENCIL WORD PROCESSOR
0000                     0003 ;                    WITH
0000                     0004 ;           DIABLO PRINT PACKAGE
0000                     0005 ;
0000                     0006 ;    VER. DV   REV 0   VDM-1   MAY 1977
0000                     0007 ;    COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                     0008 ;            ALL RIGHTS RESERVED
0000                     0009 ;
0000 00 00               0032        DW      0            RESERVED FOR USER
0002 00 00               0033        DW      0            INITIALIZATION OF
0004 00 00               0034        DW      0            I/O BOARD SUCH AS
0006 00 00               0035        DW      0            IMSAI SIO-2, ETC.
0008 00 00               0036        DW      0
000A 00 00               0037        DW      0
0019                     0046 ;
0019 C8                  0047        DB      CTRL         VDM CONTROL PORT
0082                     0098 ;
0082 7F                  0099        DB      RUB          DELETE CHARACTER
011D                     0167 ;
011D 00 E0               0168        DW      MONI         SYSTEM MONITOR
07C6                     1055 ;
07C6 7F                  1056        DB      RUB          DELETE CHARACTER
0922                     1241 ;
0922 1B                  1242        DB      ESC          ESCAPE CHARACTER
0927                     1247 ;
0927                     1248 ;    KEYBOARD INPUT ROUTINE
0927                     1249 ;
0927 DB 00               1250 STATS  IN      STAT         GET KEYBOARD STATUS
0929 E6 01               1251        ANI     DAV          MASK STATUS BIT
092B C2 27 09            1252        JNZ     STATS        MAY NEED JZ HERE
092E C9                  1253        RET
0932 DB 01               1257 INP8   IN      DATA         GET KEYBOARD DATA
0934 E6 7F               1258        ANI     127          STRIP PARITY BIT
0936 C9                  1259        RET
095F                     1282 ;
095F                     1283 ;    PRINTER OUTPUT ROUTINE
095F                     1284 ;
095F F5                  1285 OUT8   PUSH    PSW
0960 DB 00               1286        IN      STAT         GET PRINTER STATUS
0962 E6 80               1287        ANI     TBE          MASK STATUS BIT
0964 C2 60 09            1288        JNZ     OUT8+1       MAY NEED JZ HERE
0967 F1                  1289        POP     PSW
0968 D3 01               1290        OUT     DATA         OUTPUT TO PRINTER
096A C9                  1291        RET
0A2C                     1394 ;
0A2C 1B                  1395        DB      ESC          ESCAPE CHARACTER
0CAA 1B                  1704        DB      ESC          ESCAPE CHARACTER
0CB9 1B                  1715        DB      ESC          ESCAPE CHARACTER
0E7C                     1817 ;
0E7C 00 CC               1818 BASE   DW      0CC00H       VDM MEMORY ADDRESS
```

```
0000                     0001  ;
0000                     0002  ;      THE ELECTRIC PENCIL WORD PROCESSOR
0000                     0003  ;                      WITH
0000                     0004  ;              DIABLO PRINT PACKAGE
0000                     0005  ;
0000                     0006  ;      VER. DP  REV 0     POLY     MAY 1977
0000                     0007  ;      COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                     0008  ;              ALL RIGHTS RESERVED
0000                     0009  ;
0000 00 00               0031        DW      0            · RESERVED FOR USER
0002 00 00               0032        DW      0              INITIALIZATION OF
0004 00 00               0033        DW      0              I/O BOARD, ETC.
0006 00 00               0034        DW      0
0008 00 00               0035        DW      0
000A 00 00               0036        DW      0
000C                     0037  ;
007F 7F                  0092        DB      RUB            DELETE CHARACTER
011A                     0160  ;
011A 00 E0               0161        DW      MONI           SYSTEM MONITOR
07CA                     1052  ;
07CA 7F                  1053        DB      RUB            DELETE CHARACTER
0929                     1240  ;
0929 1B                  1241        DB      ESC            ESCAPE CHARACTER
092A                     1242  ;
092E                     1247  ;      KEYBOARD INPUT ROUTINE
092E                     1248  ;
092E DB 00               1249  STATS IN      STAT           GET KEYBOARD STATUS
0930 E6 01               1250        ANI     DAV            MASK STATUS BIT
0932 C2 2E 09            1251        JNZ     STATS          MAY NEED JZ HERE
0935 C9                  1252        RET
0939 DB 01               1256  INP8  IN      DATA           GET KEYBOARD DATA
093B E6 7F               1257        ANI     127            STRIP PARITY BIT
093D C9                  1258        RET
0966                     1281  ;
0966                     1282  ;      PRINTER OUTPUT ROUTINE
0966                     1283  ;
0966 F5                  1284  OUT8  PUSH    PSW
0967 DB 00               1285        IN      STAT           GET PRINTER STATUS
0969 E6 80               1286        ANI     TBE            MASK STATUS BIT
096B C2 67 09            1287        JNZ     OUT8+1         MAY NEED JZ HERE
096E F1                  1288        POP     PSW
096F D3 01               1289        OUT     DATA           OUTPUT TO PRINTER
0971 C9                  1290        RET
0A33                     1393  ;
0A33 1B                  1394        DB      ESC            ESCAPE CHARACTER
0CB3 1B                  1703        DB      ESC            ESCAPE CHARACTER
0CC2 1B                  1713        DB      ESC            ESCAPE CHARACTER
0CC3                     1714  ;
0E85 00 CC               1816  BASE  DW      0CC00H         POLY MEMORY ADDRESS
```

```
0000                          0002 ;
0000                          0003 ;         THE ELECTRIC PENCIL WORD PROCESSOR
0000                          0004 ;                        WITH
0000                          0005 ;                 STANDARD PRINT PACKAGE
0000                          0006 ;                        AND
0000                          0007 ;             NORTH STAR DISK INTERFACE
0000                          0008 ;
0000                          0009 ;       VER. SVN    REV Ø       NOVEMBER 1977
0000                          0010 ;       COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                          0011 ;              ALL RIGHTS RESERVED
0000                          0012 ;
0000                          0034 ;
0000 00 00                    0035           DW      Ø           RESERVED FOR USER
0002 00 00                    0036           DW      Ø           INITIALIZATION OF
0004 00 00                    0037           DW      Ø           I/Ø BOARD SUCH AS
0006 00 00                    0038           DW      Ø           IMSAI SIO-2, ETC.
0008 00 00                    0039           DW      Ø
000A 00 00                    0040           DW      Ø
0011                          0046 ;
0011 C8                       0047           DB      CTRL        VDM CONTROL PORT
0081 7F                       0102           DB      RUB         DELETE CHARACTER
011C 00 E9                    0171           DW      MONI        SYSTEM MONITOR
07D4 7F                       1125           DB      RUB         DELETE CHARACTER
0930 1B                       1327           DB      ESC         ESCAPE CHARACTER
0935                          1333 ;
0935                          1334 ;       KEYBOARD INPUT ROUTINE
0935                          1335 ;
0935 DB 00                    1336 STATS   IN      STAT        GET KEYBOARD STATUS
0937 E6 01                    1337         ANI     DAV         MASK STATUS BIT
0939 C2 35 09                 1338         JNZ     STATS       MAY NEED JZ HERE
093C C9                       1339         RET
0940                          1344 ;
0940 DB 01                    1345 INP8    IN      DATA        GET KEYBOARD DATA
0942 E6 7F                    1346         ANI     127         STRIP PARITY BIT
0944 C9                       1347         RET
0945                          1348 ;
0945                          1349 ;       PRINTER OUTPUT ROUTINE
0945                          1350 ;
0945 F5                       1351 OUT8    PUSH    PSW
0946 DB 00                    1352         IN      STAT        GET PRINTER STATUS
0948 E6 80                    1353         ANI     TBE         MASK STATUS BIT
094A C2 46 09                 1354         JNZ     OUT8+1      MAY NEED JZ HERE
094D F1                       1355         POP     PSW
094E D3 01                    1356         OUT     DATA        OUTPUT TO PRINTER
0950 C9                       1357         RET
0A12                          1468 ;
0A12 1B                       1469         DB      ESC         ESCAPE CHARACTER
0B54 00                       1637         DB      Ø           NULL CHARACTER
0B56 00                       1642         DB      Ø           NUMBER OF NULLS
0E2A                          1885 ;
0E2A 00 CC                    1886 BASE    DW      ØCCØØH      VDM MEMORY ADDRESS
```

```
0000                      0002 ;
0000                      0003 ;         THE ELECTRIC PENCIL WORD PROCESSOR
0000                      0004 ;                      WITH
0000                      0005 ;              DIABLO PRINT PACKAGE
0000                      0006 ;                      AND
0000                      0007 ;           NORTH STAR DISK INTERFACE
0000                      0008 ;
0000                      0009 ;     VER. DVN   REV 0      NOVEMBER 1977
0000                      0010 ;     COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                      0011 ;            ALL RIGHTS RESERVED
0000                      0012 ;
0000                      0035 ;
0000 00 00               0036        DW      0               RESERVED FOR USER
0002 00 00               0037        DW      0               INITIALIZATION OF
0004 00 00               0038        DW      0               I/O BOARD SUCH AS
0006 00 00               0039        DW      0               IMSAI SIO-2, ETC.
0008 00 00               0040        DW      0
000A 00 00               0041        DW      0
0011                     0047 ;
0011 C8                  0048        DB      CTRL            VDM CONTROL PORT
0081 7F                  0103        DB      RUB             DELETE CHARACTER
011C 00 E9               0172        DW      MONI            SYSTEM MONITOR
07EE 7F                  1080        DB      RUB             DELETE CHARACTER
094A 1B                  1266        DB      ESC             ESCAPE CHARACTER
094F                     1271 ;
094F                     1272 ;       KEYBOARD INPUT ROUTINE
094F                     1273 ;
094F DB 00               1274 STATS   IN      STAT           GET KEYBOARD STATUS
0951 E6 01               1275        ANI     DAV            MASK STATUS BIT
0953 C2 4F 09            1276        JNZ     STATS          MAY NEED JZ HERE
0956 C9                  1277        RET
095A                     1281 ;
095A DB 01               1282 INP8    IN      DATA           GET KEYBOARD DATA
095C E6 7F               1283        ANI     127            STRIP PARITY BIT
095E C9                  1284        RET
0987                     1307 ;
0987                     1308 ;       PRINTER OUTPUT ROUTINE
0987                     1309 ;
0987 F5                  1310 OUT8    PUSH    PSW
0988 DB 00               1311        IN      STAT           GET PRINTER STATUS
098A E6 80               1312        ANI     TBE            MASK STATUS BIT
098C C2 88 09            1313        JNZ     OUT8+1         MAY NEED JZ HERE
098F F1                  1314        POP     PSW
0990 D3 01               1315        OUT     DATA           OUTPUT TO PRINTER
0992 C9                  1316        RET
0A54                     1419 ;
0A54 1B                  1420        DB      ESC             ESCAPE CHARACTER
0CE9 1B                  1742        DB      ESC             ESCAPE CHARACTER
0CF8 1B                  1753        DB      ESC             ESCAPE CHARACTER
0ED1                     1862 ;
0ED1 00 CC               1863 BASE    DW      0CC00H         VDM MEMORY ADDRESS
```

```
0000                      0002 ;
0000                      0003 ;        THE ELECTRIC PENCIL WORD PROCESSOR
0000                      0004 ;                      WITH
0000                      0005 ;              STANDARD PRINT PACKAGE
0000                      0006 ;                      AND
0000                      0007 ;            NORTH STAR DISK INTERFACE
0000                      0008 ;
0000                      0009 ;        VER. SPN  REV 0   POLY    NOV 1977
0000                      0010 ;        COPYRIGHT (C) 1977 MICHAEL SHRAYER
0000                      0011 ;              ALL RIGHTS RESERVED
0000                      0012 ;
0000 00 00                0034         DW      0           RESERVED FOR USER
0002 00 00                0035         DW      0           INITIALIZATION OF
0004 00 00                0036         DW      0           I/O BOARD SUCH AS
0006 00 00                0037         DW      0           IMSAI SIO-2, ETC.
0008 00 00                0038         DW      0
000A 00 00                0039         DW      0
007D                      0093 ;
007D 7F                   0094         DB      RUB         DELETE CHARACTER
0118 00 E9                0162         DW      MONI        SYSTEM MONITOR
07D7 7F                   1061         DB      RUB         DELETE CHARACTER
0936 1B                   1248         DB      ESC         ESCAPE CHARACTER
093B                      1253 ;
093B                      1254 ;       KEYBOARD INPUT ROUTINE
093B                      1255 ;
093B DB 00                1256 STATS   IN      STAT        GET KEYBOARD STATUS
093D E6 01                1257         ANI     DAV         MASK STATUS BIT
093F C2 3B 09             1258         JNZ     STATS       MAY NEED JZ HERE
0942 C9                   1259         RET
0946                      1263 ;
0946 DB 01                1264 INP8    IN      DATA        GET KEYBOARD DATA
0948 E6 7F                1265         ANI     127         STRIP PARITY BIT
094A C9                   1266         RET
094B                      1267 ;
094B                      1268 ;       PRINTER OUTPUT ROUTINE
094B                      1269 ;
094B F5                   1270 OUT8    PUSH    PSW
094C DB 00                1271         IN      STAT        GET PRINTER STATUS
094E E6 80                1272         ANI     TBE         MASK STATUS BIT
0950 C2 4C 09             1273         JNZ     OUT8+1      MAY NEED JZ HERE
0953 F1                   1274         POP     PSW
0954 D3 01                1275         OUT     DATA        OUTPUT TO PRINTER
0956 C9                   1276         RET
0957                      1277 ;
0A18 1B                   1380         DB      ESC         ESCAPE CHARACTER
0B5C 00                   1540         DB      0           NULL CHARACTER
0B5E 00                   1544         DB      0           NUMBER OF NULLS
0B5F                      1545 ;
0E32 00 CC                1783 BASE    DW      0CC00H      POLY MEMORY ADDRESS
```

ADDR	B1	B2	B3	B4	B5	EROR	LINE				
0000							0002	;			
0000							0003	;		THE ELECTRIC PENCIL WORD PROCESSOR	
0000							0004	;		WITH	
0000							0005	;		DIABLO PRINT PACKAGE	
0000							0006	;		AND	
0000							0007	;		NORTH STAR DISK INTERFACE	
0000							0008	;			
0000							0009	;	VER. DPN REV 0 POLY NOV 1977		
0000							0010	;	COPYRIGHT (C) 1977 MICHAEL SHRAYER		
0000							0011	;	ALL RIGHTS RESERVED		
0000							0012	;			
0000	00	00					0034		DW	0	RESERVED FOR USER
0002	00	00					0035		DW	0	INITIALIZATION OF
0004	00	00					0036		DW	0	I/O BOARD, ETC.
0006	00	00					0037		DW	0	
0008	00	00					0038		DW	0	
000A	00	00					0039		DW	0	
000C							0040	;			
007D	7F						0094		DB	RUB	DELETE CHARACTER
0118							0162	;			
0118	00	E9					0163		DW	MONI	SYSTEM MONITOR
07F1							1074	;			
07F1	7F						1075		DB	RUB	DELETE CHARACTER
0950							1262	;			
0950	1B						1263		DB	ESC	ESCAPE CHARACTER
0951							1264	;			
0955							1269	;	KEYBOARD INPUT ROUTINE		
0955							1270	;			
0955	DB	00				STATS	1271	IN	STAT	GET KEYBOARD STATUS	
0957	E6	01					1272	ANI	DAV	MASK STATUS BIT	
0959	C2	55	09				1273	JNZ	STATS	MAY NEED JZ HERE	
095C	C9						1274	RET			
0960	DB	01				INP8	1278	IN	DATA	GET KEYBOARD DATA	
0962	E6	7F					1279	ANI	127	STRIP PARITY BIT	
0964	C9						1280	RET			
098D							1303	;			
098D							1304	;	PRINTER OUTPUT ROUTINE		
098D							1305	;			
098D	F5					OUT8	1306	PUSH	PSW		
098E	DB	00					1307	IN	STAT	GET PRINTER STATUS	
0990	E6	80					1308	ANI	TBE	MASK STATUS BIT	
0992	C2	8E	09				1309	JNZ	OUT8+1	MAY NEED JZ HERE	
0995	F1						1310	POP	PSW		
0996	D3	01					1311	OUT	DATA	OUTPUT TO PRINTER	
0998	C9						1312	RET			
0A5A							1415	;			
0A5A	1B						1416	DB	ESC	ESCAPE CHARACTER	
0CF1	1B						1738	DB	ESC	ESCAPE CHARACTER	
0D00	1B						1748	DB	ESC	ESCAPE CHARACTER	
0D01							1749	;			
0ED9	00	CC				BASE	1858	DW	0CC00H	POLY MEMORY ADDRESS	

SELECTRIC PRINTER NOTE

This note applies only if you are using a Selectric Printer with The
Electric Pencil versions SP, SS, SV, SPN, SSN, or SVN.

SYMPTOM:

PAGE SPACING and LINE SPACING in the Sub-System Command Table don't work
properly. This is due to the fact that the Selectric printer does not
recognize line feeds, and prints a carriage return as well as a line feed
when given a carriage return only.

CURE:

STEP 1: In the following table, find the version of The Electric Pencil
that you are using. Under the version number are listed five memory
locations. At the extreme right of each line are two columns labelled OLD
and NEW. OLD is the current data at each memory location. NEW is the
replacement data that must be inserted into the same memory location.

SS	SP	SV	SSN	SPN	SVN	OLD	NEW
0AD7	0AE0	0AD7	0ABC	0AF5	0AED	0A	0D
0AF5	0AFE	0AF5	0ADA	0B13	0B0B	0A	0D
0AFE	0B07	0AFE	0AE3	0B1C	0B14	0A	0D
0B34	0B3A	0B31	0B19	0B52	0B4A	0A	0D
0BCC	0BCF	0BC6	0BB1	0BEA	0BE2	0A	0D

STEP 2: In the following table, locate your version of The Electric
Pencil. Under the version number is listed the memory locations of a range
of five bytes. Fill these five memory locations with NOPs (zeros).

SS	SP	SV	SSN	SPN	SVN
0B38	0B3E	0B35	0B1D	0B56	0B4E
to	to	to	to	to	to
0B3C	0B42	0B39	0B21	0B5A	0B52

Save the new patched version of The Electric Pencil onto cassette or
diskette depending on the version.

Note: The underline feature of The Electric Pencil will not work on the
Selectric printer.