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(MISC)

FORMAT, A TEXT PROCESSING PROGRAM

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The FORMAT text-processing program was written by G. M. Berns, an employee of the IBM Washington Scientific Center. It was made available to IBM System/360 users as a Type III program (number 360D-06.0.003) available from IBM's Program Information Department.

The program was modified and elaborated at SLAC by J. R. Ehrman, with the help and advice of Mr. Berns. The current version of the program (Release 5) is available from

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The FORMAT Manual

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Release 5

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CONTENTS

I. Summary of Facilities

FORMAT is a program for System/360 and System/370 designed to meet the need for a rapid method of editing and producing papers, reports, and other finished and reproducible documents directly on the system printer, using upper and lower case and special characters. It has facilities which simplify the task of index construction. Input to the program is free-form card-image text. The document is formatted and controlled according to control cards and Command Words interspersed throughout the input. FORMAT is a single program requiring no auxiliary programs for its operation.

Via entirely free-form control cards the user may specify:

--- Automatic capitalization of all sentences
--- Number of text columns per page
--- Width of text columns
--- Number of lines per page
--- Number of print positions between text columns
--- Page numbering and first page number (or no numbering)
--- Location of page number on the right, the left, or alternating
--- Number of print positions for paragraph indentation
--- Number of print positions for column indentation
--- Line spacing (single spacing, double spacing, etc.)
--- Number of lines between paragraphs
--- Right-justification of text (or not)
--- Tab settings
--- Extent of card field from which input is to be read
--- Printing of title on every page (or not)
--- Position of the title
--- Position of the text
--- Position of the footer
--- Sentences separated by a minimum of 1 or 2 blanks
--- Kind of keypunch used
--- Upper and lower case output (or all upper case)
--- Number of copies of document
--- Creation of condensed input tape from card deck
--- Editing of input master tape
--- Listing and/or punching of input dataset
--- Tape input
--- Tape output
--- Printing of output master tape
--- Merging and/or joining of input tapes
--- Production of an alphabetized list of all significant words in the document, with a count of each
--- That certain words, phrases, or strings be located

--- That specific characters are to be left in the spaces skipped over when tabulating to new column positions
--- That a particular special character should be recognized as requesting overprinting
--- That a page should be made darker by printing each line more than once, on top of itself
--- That a particular special character should be recognized as a non-eliminatable blank
--- That underlining should or should not begin and end under punctuation characters
--- That non-eliminatable blanks should or should not be considered when centering and underlining text

FORMAT does not provide facilities for automatic hyphenation, for automatic production of a table of contents, or for footnotes; page numbers appear only at the top of the page.

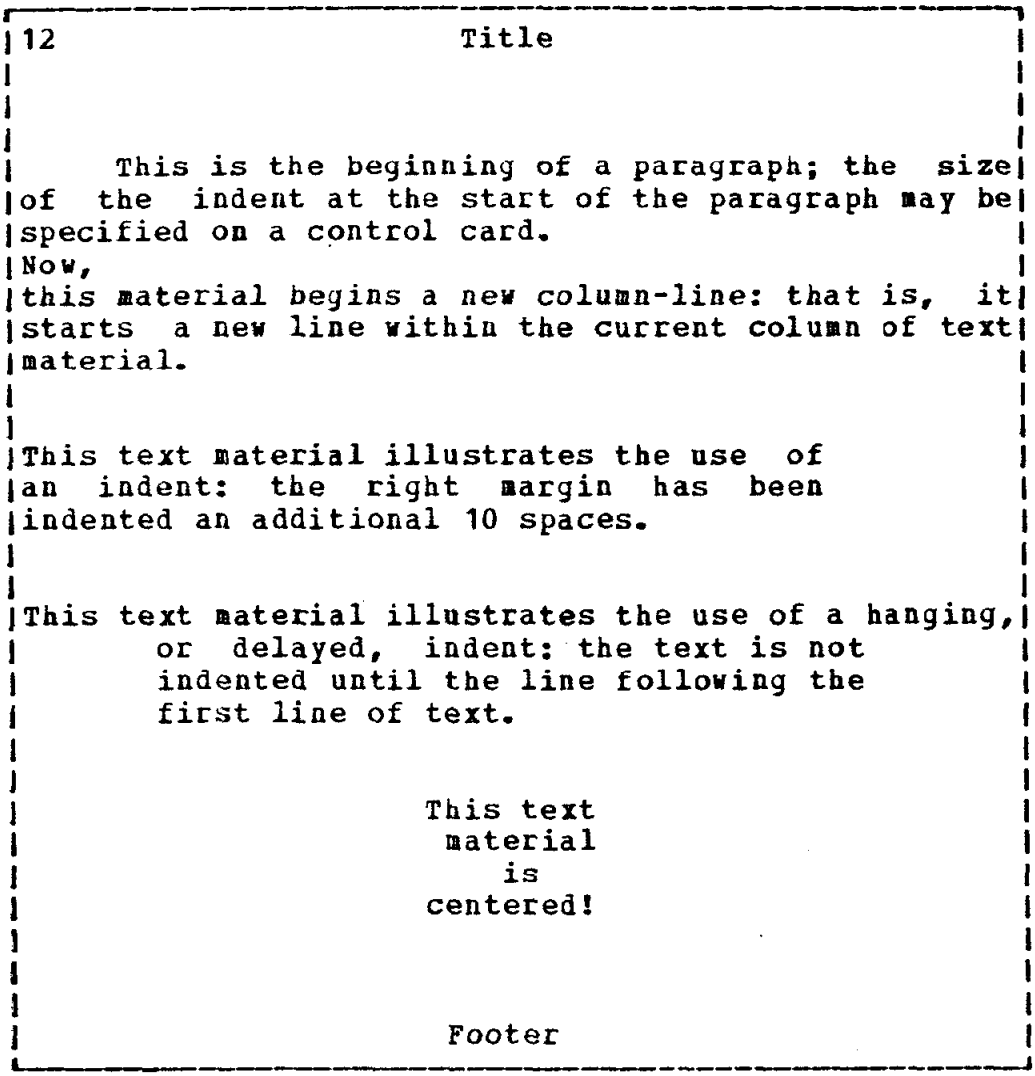
Commands embedded within the text (called Command Words) provide the capability to start a new line, paragraph, column, and page; to tabulate leaving blanks, dots, or any other character in the spaces skipped over; to underline (and to stop); to read groups of control cards; to center text within a column-line (and to stop); to print text "as is" (and to stop); to print text in upper case (and to stop); to print text with each word capitalized (and to stop); to indent (immediate or delayed) either or both column margins (and to restore the column format); to keep the next n lines in the same text column; and to keep text of unspecified length in the same text column.

FORMAT requires a minimum memory size of 64K in a standard System/360. No additional devices are required beyond those necessary to operate OS/360; however, the availability to the program of magnetic tape drives greatly enhances its usefulness, especially if the Editor facility is to be used with any regularity. FORMAT is written entirely in full Fortran IV and requires the full Fortran library. The System Input dataset (from which FORMAT reads its card input), the System Output dataset (on which FORMAT prints the document and other materials), and the System Punch dataset (which is used for punching a condensed form of the input deck), are defined as Fortran dataset reference numbers 5, 6, and 7, respectively.

The normal output mode is upper and lower case. Means are provided to allow the user to specify upper case only, and special characters. FORMAT produces its normal output for the TN print train, and has facilities for printing all of the 120 possible characters. Note that no subscripts are provided by the TN print train, nor, therefore, by FORMAT.

II. Introduction

Before discussing how FORMAT produces a document, we will define and illustrate some terms and notation. The figure below represents a typical page of text; we will refer to it throughout this introduction.



In the above example page, the page number is at the upper left corner; the title (which may occupy more than one line) is at the top of the page; the footer (or footing title, or running foot) is at the bottom of the page; the text material consists of a single column 52 print positions wide; the hanging text was

indented 7 spaces on the left and 8 spaces on the right; the title is separated from the text by 3 blank lines; the footer is separated from the last text line by 3 blank lines; and the indent at the start of a paragraph is 5 spaces.

FORMAT produces a document by reading control cards and text. The text is arranged on the output page in a format determined by the control cards. FORMAT reads its input in one of two phases: an edit phase and a document phase. (There may be either (1) only a document phase, or (2) an edit phase followed by a document phase. We will discuss the edit phase in Section VI.) In each of these phases, FORMAT reads its input in different modes. In the document phase, FORMAT reads its input cards in one of three modes: control card mode, normal text mode, and "as-is" text mode. (As-is text mode will be discussed in Section IV.)

To start the document phase, FORMAT begins by reading its input in control card mode. Because most of the page layout control variables have been preset to "average" values (such as 59 lines per page, 64 characters per line in a single column, etc.), the only control card needed initially is the one that signals the end of a group of control cards, and causes FORMAT to switch to normal text mode: the "GO" control card.

In text mode, FORMAT reads the input text and arranges it in the desired layout on an internal "image" of the page to be printed. As each page image is filled, it is sent to the printer. If any errors are detected, FORMAT makes a note of each, and will print a list of diagnostic messages describing the error at the end of the job. For most errors, FORMAT will assign default values to the erroneous variables, or take default actions for erroneous commands.

While in normal text mode, the user will normally wish to specify actions such as "begin a new paragraph", "skip to a new line", "indent the margins", and so forth. These actions are requested with Command Words, which may appear anywhere in the input text. They are not printed by FORMAT, but cause it to take the specified actions instead (unless they are incorrectly given and therefore cause an error).

FORMAT detects the start of a Command Word by finding an escape character: a right parenthesis which is preceded by one or more blanks (spaces), and followed by one or more non-blank characters. The characters which follow the right parenthesis are called Command Operands, and they specify what actions FORMAT should take. A Command Word is ended by one or more blanks. (Even though it is very unlikely that the input text

will contain a string of characters starting with a right parenthesis, FORMAT provides the Special Operands (described in Section V) which allow us to print such a string if it is desired. Thus the choice of the right parenthesis as the "escape character" is not a limitation on the user.)

To illustrate, the Command Operand which requests the start of a new paragraph is the letter "P". Thus, if the input text contained the Command Word ")P ", the following text material would begin a new paragraph. Another commonly used Command Operand is "L", which has an effect similar to the action caused by striking the "return" key on a typewriter: the end of the current line is signaled, and the carriage is positioned at the start of the following line. Thus, the Command Word ")LL " would cause the line of text in which it appears to terminate, and the following line to be skipped. This example of a command word contains two Command Operands, "L" and "L"; this shows how Command Operands are grouped to form Command Words.

We will now look at a simple example of FORMAT input: suppose we wish to print the first part of the text material shown in the figure. The input text could be prepared as follows:

```
)P THIS IS        THE BEGINNING OF A PARAGRAPH; THE
                SIZE OF THE INDENT AT THE START      OF THE
PARAGRAPH MAY BE SPECIFIED ON A CONTROL CARD. )L NOW,    )L
THIS
MATERIAL BEGINS A NEW COLUMN-LINE: THAT IS, IT      STARTS
A NEW LINE WITHIN THE CURRENT COLUMN OF TEXT MATERIAL. )LLL
```

Several important points are illustrated in this example. First, the input to FORMAT is entirely free-form: the user may leave as many spaces between input words as he likes, and FORMAT will ignore the excess blanks as it collects words to be placed in the page image. Second, there is no need to start a new input line when a new output line is desired; the "L" Command Operand will start a new line on the output page.

As the input cards are read by FORMAT, it may be necessary to change some of the control variables which determine the arrangement of the text on the page. For example, the user may want to change from one column per page to two (as was done to produce the index for this manual). To go from normal text mode back to control card mode, a Command Word is placed in the input stream which ends with the Command Operand "V". The rest of the card following the "V" is ignored, and FORMAT begins reading

control cards with the next input card. Thus, the user can dynamically modify the layout of the text on the page, and can change the values of the control variables. As before, the end of the control card group is signaled by a "GO" control card.

To illustrate, suppose we wish to set the margin indents to be zero spaces at the left and ten spaces at the right, as in the second portion of the figure above. The necessary input could be prepared as follows:

```
     )V
INDENTATION OF THE COLUMN IS (0,10) POSITIONS
GO
)I ¢THIS TEXT MATERIAL ILLUSTRATES
THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
ADDITIONAL 10 SPACES.    )ILLL
```

In this example, the "I" Command Operand was used to control indentation of the margins. Its operation is like that of an "on-off" switch: each appearance of the "I" Command Operand causes indentation to begin (if it was not already in effect) or to end (if it was in effect). It is not like the "L" Command Operand, which causes a new line each time it appears; "I" does not cause additional indentation each time it appears, but turns the indentation on or off. The "¢" sign preceding the word "THIS" is called a Special Operand. It causes the immediately following letter (the "T") to be capitalized in the printed output. Special Operands will be discussed in Section V.

We observe that the next segment of text material in the figure also requires an indentation. The control card which allows us to set the amount of indentation (the "INDENTATION OF THE COLUMN" control card) can specify up to seven different indentations. Thus, rather than prepare another control card, we will go back and change the previous input material so that it will control both of the indented segments of text in the figure. The use of the "H" Command Operand will be explained shortly.

```
     )V
INDENTATION OF THE COLUMN IS (0,10),(7,8) POSITIONS
GO
)I ¢THIS TEXT MATERIAL ILLUSTRATES
THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
ADDITIONAL 10 SPACES.    )ILLLH2 THIS TEXT MATERIAL
ILLUSTRATES THE USE OF A HANGING, OR DELAYED, INDENT: THE
TEXT IS NOT INDENTED UNTIL THE LINE FOLLOWING THE FIRST
LINE OF TEXT. )H2LLL
```

As noted above for "I", the "H" Command Operand works like an on-off switch. An additional feature illustrated in the above example is the "2" following the "H" Command Operand, which means that the second pair of column indentations is to be used in determining the number of positions to indent. Several other Command Operands may be followed by a number; they are discussed in Section IV.

The last text segment in the figure could be prepared as follows:

```
)M THIS TEXT )L MATERIAL )L IS )L     CENTERED! )M
```

The "M" Command Operand causes centering of the printed text to begin or end. It is like the "I" and "H" Command Operands in being like an on-off switch, but "M" does not depend on a control card to determine the amounts of spacing to be performed.

FORMAT determines that the end of the input has been reached when it detects a Command Word ending with the Command Operand "E". (This means, of course, that the end of the input should occur in normal text mode, not in "as-is" text mode or in control card mode.) FORMAT then prints the final text page, followed by a list of all control cards read, and the diagnostics (if any). At this point, FORMAT will re-initialize itself to read a fresh job, starting to read in control card mode just as it did at the very beginning. Thus, multiple documents may be produced in a single computer run.

To illustrate a complete FORMAT job, we will now give a complete set of input "card images" that could be used to produce the figure at the start of this section. The reader is not expected to understand all of the FORMAT techniques used, although most of them will be familiar.

```
CAPITALIZE AUTOMATICALLY
WIDTH OF COLUMN IS 52 PRINT POSITIONS
LINES PER PAGE ARE 32
TEXT STARTS ON LINE 5, IN PRINT POSITION 1
COLUMNS PER PAGE = 1
LEFT TOP POSITION FOR PAGE NUMBER
PAGE NUMBER STARTING AT 12
TITLE STARTS ON LINE 1, IN PRINT POSITION 24
)F TITLE )FE
FOOTER STARTS ON LINE 32, IN PRINT POSITION 23
)F FOOTER )FE
GO
```

```
)P THIS IS       THE BEGINNING OF A PARAGRAPH; THE
               SIZE OF THE INDENT AT THE START     OF THE
PARAGRAPH MAY BE SPECIFIED ON A CONTROL CARD. )L NOW,   )L
THIS
MATERIAL BEGINS A NEW COLUMN-LINE: THAT IS, IT     STARTS
A NEW LINE WITHIN THE CURRENT COLUMN OF TEXT MATERIAL. )LLLV
INDENTATION OF THE COLUMN IS (0,10),(7,8) POSITIONS
GO
)I ¢THIS TEXT MATERIAL ILLUSTRATES
THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
ADDITIONAL 10 SPACES.    )ILLLH2 THIS TEXT MATERIAL
ILLUSTRATES THE USE OF A HANGING, OR DELAYED, INDENT: THE
TEXT IS NOT INDENTED UNTIL THE LINE FOLLOWING THE FIRST
LINE OF TEXT. )H2LLL
)M THIS TEXT )L MATERIAL )L IS )L    CENTERED! )ME
```

This example shows the three levels of control provided by FORMAT. Control cards provide global controls; Command Words provide controls at the word level; and Special Operands provide controls at the character level.

FORMAT provides a number of other powerful capabilities such as the DICTIONARY, $LOCATE, and EDITOR facilities. The beginner should experiment with simple text input until some familiarity with FORMAT has been attained. As a start, study the input which produced the examples above. Then punch the above FORMAT job on cards, add the necessary Job Control cards (see Section X; an experienced programmer can help prepare them), and run the job on the computer. Then generate some simple input text, and experiment with other FORMAT features.

A suggested sequence for reading this manual is to skim Sections III through V, and the hints and suggestions given in Section XI. Then, after studying the above input and running a few simple problems, go back and study those sections more carefully. As more experience is gained, the other parts of the manual may be consulted as needed.

III. Control Cards

Every FORMAT job must begin with a control card group, which is defined as a group of control cards ending with the "GO" control card (all other control cards are optional). The position of a control card within a control card group is not significant, unless specified in its description. A control card group may appear at any point in the input text stream (see the "V" Command Operand in Section IV). Default values for each option are assumed if no control card pertaining to that particular option has been supplied in any control card group in the job. The default values are summarized in Section VIII. The values of most of the options can be varied as needed during the reading of the input and the formatting of the document. However, some of the options cannot be reset once they have been set, as noted in their descriptions.

The format of each control card is entirely free-form, as long as the first 3 non-blank characters of each control card are as specified by the suggested control card name, and the control card is on one card image. (FORMAT scans control cards by saving the first three non-blank characters, and then searching for the numbers that give the values of the parameters.) At the conclusion of each job, the control cards used for that job are listed by group on the System Output dataset.

We will now give the specifications for each of the control cards in turn. In some of the descriptions, it is stated that some option may or may not be used in a title; in all such cases, the statement applies to footers also. Examples of correct and faulty control cards will be given at the end of this section. In some of the control cards, numeric operands may be required. These are represented by lower-case letters such as x, y, z, or nn; an operand such as x is not limited to a single digit.

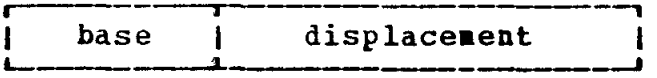
BACKSPACE CHARACTER IS SPECIAL CHARACTER NUMBER nn

To simulate the action of the backspace key on a typewriter, one of the special characters (described in Section V) may be designated as the "backspace" character, except for special characters numbered 43 (¢) and 51 (!). The action of the backspace character is as follows: the character to be printed

over and the overprint character are separated by the backspace character, with a few minor exceptions. If the backspace character is followed by a blank, then it is assumed that no overprint was desired, and the backspace character will print normally. Multiple backspaces are ignored, and have no more effect than a single one; they all cause only a single backspace, and the only character which will overprint the character preceding the first backspace will be the character following the last backspace.

The number nn given on the control card must lie between 10 and 50; if it does not, backspacing will be turned off and no character will be recognized as a backspace. Note that the backspace character, when used in the input text, may be in its actual (character) form or in its special (!nn) form. The default action is that no backspaces are recognized.

To give some examples: suppose the backspace character is number 50, the question mark (?). Then the input characters 0?- would produce θ, /?o would produce ø, and lett?_er would produce letter. Note that special characters may be used for overprinting, so that =!50!33 would produce ≠. The figure below makes use of backspacing to print the dividers at the inside edges of the boxes: the characters -?, produce ┬, and the characters -?J produce ┴.



At most 99 backspaces are allowed on a single page. Any backspaces following the 99th will be ignored, and the backspace character will print normally. An error message will flag the location of the 100th backspace on the page.

Backspaces will not work correctly inside a "keep" (a region of text delimited by)K's; see Section IV for a description of a "keep"). The backspace character itself may not be used for overprinting. Backspacing does not apply in titles and footers.

BETWEEN COLUMNS LEAVE x BLANKS

The number of print positions separating text columns is x. The default number is 2.

CAPITALIZE AUTOMATICALLY

When this control card is in effect, FORMAT will automatically capitalize the first word of the document, the first word following Command Operands "P" and "S", and each letter which follows .b !b ?b ."b !"b ?"b .)b !)b and ?)b (where b = one or more blanks) in text and titles. The default action is that this option is not used. (See the "NO CAPITALIZATION AUTOMATICALLY" control card.)

CARD FIELD IS x THRU y
or
CARD FIELD EXTENDS THRU y

This control card (in either form) specifies the columns of the input data cards to be used for reading normal text (in text mode), and text for titles and footers (which is read in control card mode). The first column of the card field is x, and the last column of the card field is y. If the second form of the control card is used, the card field extends from column 1 through column y. This control card does not affect control cards (which may be limited by the "CONTROL CARDS END IN" control card; see below), but all other card input to FORMAT, including titles, is read from the field specified. The field must be at least 3 columns wide, and at most 80 columns wide. The default card field is columns 1 through 80.

CENTER TEXT ON LINE x

The first line of the text is printer line x, and the document is centered, if possible, within the print line of 132 characters. The default is line 5 and centering of the document on the printer page. (See the "LINES PER PAGE" and "TEXT STARTS ON" control cards also.)

COLUMNS PER PAGE = x

The number of text columns per document page is x. The maximum allowable number of text columns per page is eight. The default number is 1.

CONTROL CARDS END IN COLUMN x

This control card allows the user to control the position of the right-hand margin of a control card in the same way as

can be done for text input with the "CARD FIELD" control card. If the value of x is less than 7 or greater than 80, it will be set to 80. This control card takes effect starting with the following control card. The default value of x is 80. Note that even though the text for titles and footers is part of a control card group, the card field from which it is taken is set by the "CARD FIELD" control card.

COPIES = x

X specifies the number of copies of the document which are to be produced during the run. The default value is 1. If x is 2 or more, the output dataset from the program is written onto dataset reference number 8 (see Section IX). At the conclusion of the last FORMAT job, dataset reference number 8 is copied onto the System Output dataset x times, where x is the operand field from the last "COPIES = x" control card read. If x is zero it is treated as one, unless the "OUTPUT IS TAPE" control card is specified.

CREATE A TAPE FROM CARD INPUT

If the input dataset is currently the System Input dataset (which is the normal situation), then the entire input dataset following this control card is copied and condensed onto dataset reference number 2. Dataset reference number 2 is then rewound and becomes the input dataset. Printed in the upper far right corner of each document page produced are the first and last card image numbers (from the condensed deck) that were used in producing that page.

FORMAT's condensing function squeezes out unneeded blanks, and responds to but prevents the following three control cards from being copied into the condensed dataset: "029 KEYPUNCH", "026 KEYPUNCH", and "CARD FIELD IS... ". The result is a compact card image dataset (80 characters per record, all of which are used) on which all right parentheses (except those within "as is" regions) are in the 029 (EBCDIC) mode, regardless of their mode in the original card input dataset.

At the conclusion of the run the input dataset on dataset reference number 2 (the condensed input) is listed, with card image numbers and numbered text and title words, onto the System Output dataset. If the listing is printed in upper case only (due either to errors or to the presence of the "SPECIAL PRINT TRAIN" control card), then an asterisk will replace each character for which no graphic is likely to be associated. The

Command Operands contained in each card image are listed again alongside each card image.

The primary use of this control card is to produce a card image input dataset that can be saved for later editing; see Section VI for a description of the Editor facility.

CYCLE THE PAGE NUMBER

If page numbering has been requested (by the LEFT TOP POSITION" or "RIGHT TOP POSITION" control card), then the page number will be alternated between the left and right top corners on successive document pages. The page number appears on line 1 aligned with the appropriate border of the text. The default action is that the first page number is aligned with the right text border. (See the "LEFT TOP POSITION", "RIGHT TOP POSITION", and "PAGE NUMBER" control cards.) Once cycling of the page number has been requested, it stays in effect for the remainder of that job.

DARK PRINT EACH PAGE x TIMES

Normally, each line on the output page will be printed once. If x has a value of 2 or 3, each line will be printed successively on top of itself until it has been printed a total of x times. This allows darker printing of the page, and if the printer is well-adjusted and the printer ribbon is neither too new nor too old, the text is printed without the normal blur and grain from the ribbon. If x is 0, it is set to 1, and if it is greater than 3, it is set to 3. The number of times each line is printed is determined by the value of x in effect at the time the entire page is printed, so it is not possible to print portions of a page in "boldface". The default is single printing.

DICTIONARY OF WORDS USED

An alphabetized list, 6 columns per page, of all significant words in the input stream, with a count of the occurrences of each, is written onto the System Output dataset at the conclusion of the last FORMAT job. This dictionary, in upper case, is formed according to the following rules:

- no word of fewer than 3 letters is listed
- all non-letters are treated as word delimiters, except for "¢" which is ignored

- Command Words are ignored
- case of the printed text is ignored, but the input must be in upper case (see the "SPECIAL KEYPUNCH" control card)
- text, titles, and control cards alike are scanned
- words longer than 40 letters are broken up into 40 letter segments
- 94 common words (such as "though", "also", and "where") are suppressed

The dictionary is useful for determining a rough list of candidates for an index, and for a spelling check. The "$LOCATE" Editor control card can be used (in the edit phase) to find the location of "index candidates" in context.

The DICTIONARY facility uses dataset reference numbers 2 and 3 (see Section IX for details).

DROP CHARACTER FOR 'D' COMMAND IS x

When a tab command is used to skip over blank positions in a column line, the spaces can optionally be filled with a character such as a dot. This character is called the "drop" character, since it may be thought of as being "dropped behind" as the line position moves to the right. Normally, the character dropped by the "D" Command Operand (see Section IV) will be a period. This control card may be used to change that character, as follows: if x is a number between 10 and 51, then the drop character will be the corresponding special character; if x lies between 64 and 255, the drop character will be the EBCDIC character whose representation has that value; if it is zero or omitted, then the drop character will be reset to a period. The default character is a period. As an example, the control card "DROP 30" would drop "bullets" (•) when the 'D' command operand is used.

EDITOR

This control card invokes the FORMAT Editor, which is described in Section VI. If used, this control card must be the first of the job and must be part of the System Input dataset.

FOOTER ON LINE x PRINT POSITION y PRECEDED BY z BLANK LINES

The footer is placed into the print page beginning on line x at print position y, and is separated from the last line of text by at least z blank lines. This control card, if used, must

be followed immediately by the footer text. The text of the footer must be ended by the "E" Command Operand. After the footer text, the only allowable control card is the "TITLE" or the "GO" control card. The footer appears on every document page until it is replaced (through the use of another "FOOTER" control card.) The default value for x is the last line of the document page, the default value for y is the print position of the left text border of the document, and the default value for z is 2.

GO

This is the only control card required by FORMAT. GO signals the end of a control card group, and initiates processing in normal text mode.

INDENTATION OF THE COLUMN IS (x1,y1),...,(x7,y7) POSITIONS

This control card, when used with the "H" and "I" Command Operands, enables the user to reduce the width of text columns by x positions on the left and y positions on the right. Seven pairs of column indentations may be specified. The default action is that all x's and y's are zero.

JUSTIFICATION

Text in the document body is right-justified within column-lines, except when a column-line is terminated by a Command Word, or when the line contains tabs. After reading the input and eliminating all extra blanks, FORMAT then performs right-justification by introducing the necessary number of extra blanks, one to each word delimiter, working alternately from the right end of the line leftward and the left end of the line rightward on successive lines. The number of blanks between input text words is ignored. FORMAT does no hyphenation, which means that column-lines containing long words may have large gaps between words. The default action is right-justification. (See the "NO JUSTIFICATION" control card.)

LEFT TOP POSITION FOR PAGE NUMBER

The page number (if any) is placed on line 1 aligned with the left text border. The default action is that it is aligned with the right text border. (See the "CYCLE PAGE NUMBER", "PAGE NUMBER", and "RIGHT TOP POSITION" control cards.)

LINES PER PAGE ARE x

The number of lines of all kinds (including text lines, paragraph separation lines, title lines, and blank lines) which are allowed on a document page is x. The operand may be any number in the range 5 through 1000. The default number is 59.

LIST THE INPUT DATASET

This control card is identical in effect to the "CREATE A TAPE" control card.

NO CAPITALIZATION AUTOMATICALLY

No capitals are automatically produced. This is also the default. (See the "CAPITALIZE AUTOMATICALLY" control card.)

NO JUSTIFICATION

The text is not right-justified (as illustrated in this paragraph, which will have an uneven right margin.) The number of blanks between input text words is ignored. The default action is right-justification of text.

NONTRIVIAL BLANK IS REPRESENTED BY SPECIAL CHARACTER nn

To facilitate the use of the non-trivial (or non-eliminatable) blank from devices (such as IBM 2741 terminals) which do not allow it to be entered in the source stream, the user may make the appearance of one of the special characters be equivalent to the presence of a non-trivial blank. The number nn must be between 10 and 51; otherwise no character will be replaced by the non-trivial blank when it is encountered. Note that the actual special character must be present to be replaced, and not the "special character representation" !nn, which will be treated normally. For example, if the nontrivial blank is represented by special character number 46 (@), then the text "here@@@@@there" would be printed as "here there", and the non-trivial blanks are not eliminated as ordinary blanks would be. This equivalence also takes effect in titles and footers. The default is that no such equivalence is made.

NULL CHARACTER SWITCH SET TO x

Non-trivial blanks (or null characters) are normally ignored for centering or underlining purposes when they are at the end of a word. If x has the value 2, they will not be ignored when centering and underlining (under control of the "M" and "U" Command Operands, respectively). If x has any other value, it will be set to 1, which implies that null characters will be treated normally. The default setting is 1. The effect of this card does not apply in Titles or Footers.

OUTPUT MEDIUM IS TAPE

The output from FORMAT is written onto dataset reference number 8 from the point at which this control card is read. At the conclusion of the job(s) the tape is copied onto the System Output dataset the number of times specified on the last read "COPIES = x" control card; or once, if multiple copies are not specified. The tape can then be listed at some other time, using the "PRINT OUTPUT TAPE" control card.

PAGE NUMBER STARTING AT x

The page number starts at x (if non-blank and non-zero) and is placed on line 1 of each document page. If x is zero or blank, page numbering is suppressed. The default page number is 1. (See the "CYCLE PAGE NUMBER", "LEFT TOP POSITION", and "RIGHT TOP POSITION" control cards.) If page numbering is requested (by the "RIGHT TOP POSITION" or "LEFT TOP POSITION" control cards), then enough character positions must be reserved at both the top left and top right corners of the page for the digits of the page number, whether or not the number will actually appear in both positions.

PARAGRAPH INDENT IS x

The number of print positions skipped at the start of a paragraph is x. The default indentation is 5 print positions.

PRINT OUTPUT TAPE

The presence of this control card means that the user has placed a FORMAT-generated output dataset (usually a tape) onto dataset reference number 8, and that he wishes to list it onto the System Output dataset the number of times specified on the

most recent "COPIES = x" control card; or, if none, once. This action is immediate, no document is formed from an input dataset, and no control cards or error diagnostics relating to the current input are written. It is suggested that the tape be file-protected.

PUNCH THE INPUT DATASET

The effect of this control card is identical to that of the "CREATE A TAPE" control card, and in addition, the newly created condensed input deck is punched (i.e., written onto the System Punch dataset) as well as listed at the conclusion of the run.

REPEAT TITLE ON EVERY PAGE

The title (if any) is printed on every page of the document. The default action limits the appearance of the title to the next page produced. (See the "STOP PRINTING TITLE" control card.) Note that the title and footer printed for a given page of text are those in effect when the end of the current page is reached. This means that changing the title or footer when text is being accumulated in mid-page will place the new title or footer on the current page, replacing the old one (possibly before it was expected to).

RIGHT TOP POSITION FOR PAGE NUMBER

The page number (if any) is placed on line 1 aligned with the right text border. The default action is the same as the action of this control card. (See the "CYCLE PAGE NUMBER", "LEFT TOP POSITION", and "PAGE NUMBER" control cards.)

SENTENCES SEPARATED BY AT LEAST x SPACES

Text sentences are separated on the same column-line (when not in an "as is" region; see Section IV) by x blanks with "NO JUSTIFICATION" in effect, and by a minimum of x blanks with "JUSTIFICATION" in effect. The value of x may be 1 or 2; if it is not 2, it will be set to 1. The default value for x is 1. Note that FORMAT will insert a minimum of x blanks, so that extra blanks might appear. If an exact number of spaces is needed, use the non-trivial blank.

SEPARATION LINES BETWEEN PARAGRAPHS ARE x

The number of blank printer lines between paragraphs is x. The default number is 1.

SIDE BY SIDE COPIES

Two copies of the document are produced simultaneously, side by side. The default action is not to print side by side copies. There must be enough space to fit two copies of the printed text, and at least one separating space, into a 132-character print line.

SPACING OF TEXT LINES IS x

The spacing for the document is x (e.g., x = 1 means single spacing, x = 2 means double spacing, etc.). The default assumption is single spacing.

SPECIAL KEYPUNCH
SPECIAL KEYPUNCH IS A 2741

This control card specifies that the text input originated on an upper and lower case keypunch, or on any device producing the specific EBCDIC code for each character desired. Case is not altered by the program, and (for the first form of this control card) the Special Operand "¢" does not produce superscripts. The default action is the usual case and superscript conversion. The "SPECIAL KEYPUNCH" control card allows the user to prepare upper and lower case input from a terminal, but still be able to obtain superscripts through the use of the "¢N" Special Operand technique. If there is any other numeric quantity on this control card, the normal "SPECIAL KEYPUNCH" will be assumed. Note that the effect of this card can be changed from 2741 mode to normal SPECIAL KEYPUNCH mode and back, but there is no way to return from either to the normal mode, where upper-case-only input is assumed.

SPECIAL PRINTER TRAIN

This control card implies that the ultimate printer of the document cannot print lower case or superscript characters. Therefore, no translation to lower case or superscripts is made. The default action is that the translation is made.

STOP PRINTING TITLE ON EVERY PAGE

The title (if any) is only printed on the next page produced. The default action is the same as the action of this control card. (See the "REPEAT TITLE" control card.)

TABS ARE SET AT x1,...,x14

The operand fields of this control card specify the positions of up to 14 tab stops. These are given as relative character positions within the text column-line (e.g., a tab set at 10 means that the tab field begins in character position 10 in each column-line; the first word following a tab from any position in the column-line before position 10 will be placed in the line starting in character position 10). Tabs must be set in ascending order, and no tab may be set at a position greater than the column width. The action of this control card is analogous to the action of the "tab set" key on a typewriter. The default action is that no tabs are set.

TAPE INPUT DATASET

The presence of this control card means that the user has placed a tape input dataset onto dataset reference number 2. It is suggested that the tape be file-protected. If this control card is used it must be the first control card of the job and must be part of the System Input dataset. This control card calls the FORMAT Editor; therefore, Editor control cards may follow it (see Section VI). It is identical in effect to the "EDITOR" control card, except that no listing of the edited tape is requested.

TEXT STARTS ON LINE x IN PRINT POSITION y
or
START TEXT ON LINE x IN PRINT POSITION y

The first line of the text is printer line x, and the first print position is y. The default is line 5 and the document is centered on the printer. These control cards are entirely equivalent, and the two forms are provided as a convenience.

TITLE STARTS ON LINE x IN PRINT POSITION y

The first printer line of the title is x, and the first print position of the title is y. This control card, if used,

must be followed immediately by the card images containing the title and the "GO" or "FOOTER" control card. (Remember that the title text must end with the "E" Command Operand.) The title must be positioned above the body of the document. Conflicts of the title with the page number are resolved in favor of the page number, at both of the top corners of the page. The default title line is printer line 2, and the default print position is that of the left text border.

UNDERLINE SWITCH SET TO x

If x is not zero, the underlining algorithm of FORMAT is modified so that the leading and trailing characters of an underlined string will not be underlined if they are any of the following ten punctuation or special characters: period, comma, colon, semicolon, question mark, exclamation point, quotation mark, apostrophe, and left or right parenthesis. If x is zero or blank, all characters in the string are underlined. The default value of x is zero. To give an example, suppose the input text requires that ((X)) be underlined. Then

((X)) and ((X))

would be produced by setting the underline switch to zero or nonzero respectively.

WIDTH OF COLUMNS IS x PRINT POSITIONS

The width in print positions of each text column is x. The default width is 64 print positions. If a single column per page is specified, and the width is chosen to be 132 characters (the maximum), then the maximum number of lines is 59. FORMAT allots 59*132, or 7788, characters for each page of the text. The maximum allowable column width, w, is computed as follows:

$$w = \frac{[\min(7788/L, 132)]/c - s + 1 - b * (n - 1)}{n}$$

where:

L = lines per page (from "LINES PER PAGE" control card)
c = 2 if "SIDE BY SIDE" control card is in effect;
  = 1 otherwise
s = starting print position (from "TEXT STARTS ON" control card)
b = spaces between columns (from "BETWEEN COLUMNS" control card)
n = number of text columns (from "COLUMNS/PAGE" control card)

026 KEYPUNCH

This control card specifies that the Command Words used in the input cards have been punched on an IBM 026 Keypunch, or any keypunching device which punches 12-8-4 for the character used to begin Command Words [nominally ")"]. The default action assumes the IBM 029 configuration for the ")", which is 11-8-5.

029 KEYPUNCH

This control card specifies that the Command Words used in the input cards have been punched on an IBM 029 Keypunch, or any keypunching device which punches 11-8-5 for the character used to begin Command Words [nominally ")"]. The default action is the same as the action produced by this control card.

Examples of Correct Control Cards

```
[1] . . . . . .Card Columns. . . . . .[80]

TAB SET    5   10   15   20
   TABS ARE SET AT PRINT POSITIONS 5, 10, 15 AND 20
          TABULATE TO 5 10 15 20
 TAB5 10*                              15                          20

START THE TEXT ON LINE 10, PRINT POSITION 20
START THE TEXT ON LINE 10  PRINT POSITION 20
  START D OCUMENT:   LINE = 10, P. POSITION = 20
STA      10    20
 TEXT STARTS ON LINE 10, PRINT POSITION 20

TEXT STARTS IN DEFAULT POSITION
  S T A R T   T E X T   0   ,   10
       START  TEXT   0    10
TEXT STARTS ON LINE 5 IN PRINT POSITION 10

TITLE
TITLE STARTS ON LINE 5 ABOVE LEFT TEXT BORDER

BACKSPACE CHARACTER IS NUMBER 50 (THE QUESTION MARK)
BACK 50 (?)

DAR 2
NO J              MEANS DON'T JUSTIFY
```

Examples of Faulty Control Cards

```
GO NOW
BEGIN TEXT
    (An unrecognizable control card is treated as a "GO" card)
START TEXT:   ,7
    (Text starts on line 7 in the default print position)
TABS = 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    (The 15th tab stop is ignored)
   LINES/PAGE = 5 7
    (The number of lines per page will be 5, not 57)
COLUMNS/PAGE = TWO
    (The number of columns/page will be the default value)
BACKSPACE CHARACTER IS NUMBER 43 (¢)
    (¢ cannot be used as the backspace character)
```

IV. Command Operands and Command Words

A Command Operand is an imperative order to perform an immediate text-control function. Command Operands can be interspersed as desired throughout the text input in the form of Command Words. A Command Word is a string of one or more Command Operands in the order of desired execution, prefixed by the character ")", and followed by a blank. (See the "026 KEYPUNCH" and "029 KEYPUNCH" control cards in Section III).

Some Command Operands may be used in titles (including footers), as noted in the following paragraphs. In addition, some of the Command Operands ("D", "H", "I", "T", and "W") may be followed by a numeric quantity, as in ")T4".

The functions of the Command Operands are described below. Wherever a single letter appears in quotation marks (like "L"), its use as a Command Operand (like ")L") is implied; otherwise, that letter may appear freely in the text material. It is important to remember that all Command Operands are recognized by FORMAT only if they are in upper case.

A -- Enter the "as is" text mode. In this mode, each card image is an integral unit and is printed on a separate column-line without change to the spacing of text, except that the Special Operands, and certain of the Command Operands, take no print positions. Both of the Special Operands, and the Command Operands "¢" and "F", are effective in this mode. The content of a card image beyond the effective column width is not printed. The "as is" text mode is ended when ")b" (where b = blank) occurs in the first two positions of the card image; FORMAT then resumes reading in normal text mode. (The Command Operand "A" is not recognized in "as-is" text mode, so ")A" cannot be used to terminate "as-is" mode.) The Command Operand "A" is not valid in titles.

C -- Begin the next text column. The Command Operand "C" is not valid in titles or footers.

Dn -- Tab, like "T", leaving a string of dots (periods) instead of blanks. The string of dots is prefaced by one blank. The character to be "dropped" may be changed from a dot to any other

character with the "DROP CHARACTER" control card. For a detailed description of the "D" Command Operand, see the description of the "T" Command Operand below. The Command Operand "D" is not valid in titles or footers.

E -- End the job, or end the footer or title; the next card will be read in control card mode. As many FORMAT jobs as desired may be stacked one behind the other. Jobs on cards must precede jobs which are tape resident.

F -- Begin capitalizing each word, continuing until another "F", "P", "S", or "V" Command Operand occurs. The Command Operand "F" is valid in titles and footers, and in "as-is" text mode.

Hn -- Reduce the column width starting with the next column-line. If no "hanging" (delayed) indent is currently in use, then n refers to the nth pair of arguments on the "INDENT COLUMN" control card; if n is blank, zero, or one, the first pair is referenced. If a hanging indent is currently in use, the nth pair of column indents replaces the pair in use, unless the nth pair is the one being used, in which case the hanging indent is turned off. If any hanging indent is in effect, a blank or zero value for n turns it off, as does the Command Operand "S". The Command Operands "H" and "I" may be used independently of each other. The Command Operand "H" is not valid in titles or footers.

In -- Reduce the column width immediately, and terminate the current column-line. If no immediate indent is currently in use, then n refers to the nth pair of arguments on the "INDENT COLUMN" control card; if n is blank, zero, or one, the first pair is referenced. If an immediate indent is currently in use, the nth pair of column indents replaces the pair in use, unless the nth pair is the one being used, in which case the immediate indent is turned off. If any immediate indent is in effect, a blank or zero value for n turns it off, as does the Command Operand "S". The Command Operands "I" and "H" may be used independently of each other. The Command Operand "I" is not valid in titles or footers.

J -- Start the next column-line. The action of this Command Operand is identical to the action of "L", except that it is not valid in titles and is effective at any line in the text. Unlike "L", it is not ignored at the top of a column.

K -- Keep the following text, until the next occurrence of "K", in the current text column, if possible. (A segment of text delimited by "K" Command Operands is called "kept text" or a "keep".) Otherwise, start this block of text in the next text column. The Command Operand "K" is not valid in titles and footers, and terminates the column-line on which it occurs. If this Command Operand is used, the program requires dataset reference number 2. Backspaces do not work properly inside "kept" text. See the description of the "W" Command Operand also.

L -- Start the next column-line, if not at the first line of a text column. The action of this Command Operand is similar to the action produced by striking the "return" button on an electric typewriter. "L" is valid in titles. If "L" is used in a title, the next printer line is begun; if "L" is used in the body of the document the next column-line is begun, leaving ("SPACING" - 1) blank lines between. If "L" is used at the top of a text column, it is ignored.

M -- Begin centering text within the column-line, and continue doing so for successive lines until another "M", "P", or "S" occurs. The Command Operand "M" is not valid in titles or footers; if centering is required in a title or footer, the appropriate number of non-trivial blanks may be used (see Section V).

P -- Begin a new paragraph, leaving the number of printer lines specified by the "SEPARATION LINES" control card (or its default) between paragraphs and indenting the number of print positions specified by the "PARAGRAPH INDENT" control card (or its default). A new column is begun if at least two column-lines of the present column are not available for the new paragraph. "P" stops the action initiated by Command Operands "F", "H", "U", and "ø". If "CAPITALIZE AUTOMATICALLY" is in effect, the next text word is capitalized. "P" is not valid in titles.

S -- Begin a new page. "S" stops the action initiated by Command Operands "F", "H", "I", "M", "U", and "ø". If "CAPITALIZE AUTOMATICALLY" is in effect, the next text word is capitalized. "S" is not valid in titles.

Tn -- If n is blank or zero, tab to the next set tab position beyond the present position in the column-line. The action of

"T" corresponds to the action produced by striking the tabulate key on a typewriter. Right-justification, if in effect when "T" is used, will not be performed for the column-line on which the tab occurs. The "D" and "T" Command Operands may be followed by a number which specifies the tab stop to be used. That is, ")T4" will cause a tabulation to the fourth tab position on the current column-line. If the command operand is used incorrectly, it will be ignored, and a diagnostic message will be printed. "T" is not valid in titles.

U -- Begin underlining, continuing until another "U", "P", or "S" occurs. At most 99 column-lines, or portions, may be underlined per page. Underlines neither begin nor end under the spaces skipped over by tabbing (produced by "T" and "D"). Underlines may or may not begin and end with non-trivial blanks, depending on the "NULL CHARACTER SWITCH" setting in effect (see the "NULL CHARACTER SWITCH" control card description in Section III). Underlines may or may not begin under punctuation characters, depending on the "UNDERLINE SWITCH" setting in effect (see the description of the "UNDERLINE SWITCH" control card in Section III). Individual characters within a word cannot be underlined except by backspacing (see the "BACKSPACE" control card description in Section III). The Command Operand "U" is not valid in titles or footers.

V -- Leave normal text mode, and begin to read in the next group of control cards. A control card group must immediately follow the card image containing the "V". All characters following "V" on the same card image are ignored. "V" stops the action initiated by the Command Operands "F" and "¢". If "CAPITALIZE AUTOMATICALLY" is in effect, the next text word is capitalized. The Command Operand "V" is not valid in titles or footers.

Wn -- Keep the next n column-lines in the same text column. If n column-lines do not remain in the current text column, start the next text column. "W" terminates the column-line on which it occurs. It is not valid in titles. Note that the "W" Command Operand is similar in effect to "K", but does not require the use of an additional dataset. "W" can be used to prevent "widows", which are small segments of text left alone at the bottom of a column.

¢ -- Begin printing all letters in upper case, continuing until another "¢", "P", "S", or "V" occurs. The action of "¢" is equivalent to locking a typewriter keyboard in upper case, and

then unlocking it. "¢" is valid in titles. "¢" does not cause numbers to be printed as superscripts, it is not affected by punctuation characters, nor does it cause letters punched in lower case (as indicated by a "SPECIAL KEYPUNCH" control card) to be printed as capitals. (See the description of the "¢" Special Operand in Section V also.)

Summary of Command Operands

1. Command Operands allowed in titles and footers are: "E", "F", "L", and "¢".

2. Command Operands whose effect is ended by "P" are: "F", "H", "U", and "¢".

3. Command Operands whose effect is ended by "S" are: "F", "H", "I", "M", "U", and "¢".

4. Command Operands which terminate the column-line in which they appear are: "A", "C", "E", "I", "J", "K", "L", "M", "P", "S", "V", and "W".

5. Command Operands which cause capitalization of the next text letter (if "CAPITALIZE AUTOMATICALLY" is in effect) are: "P", "S", and "V".

6. Command Operands valid in "as-is" regions are: "F" and "¢".

7. Command Operands which terminate the effect of "U" are: "P", "S", and "U".

8. Command Operands which terminate the effect of "¢" are: "P", "S", "V", and "¢".

9. Command Operands which terminate centering (initiated by "M") are: "M", "P", and "S".

10. Command Operands which terminate the effect of "F" are: "F", "P", "S", and "V".

11. Command Operands which may be followed by a numeric quantity are: "Dn", "Hn", "In", "Tn", and "Wn".

12. Command Operands whose effect is turned on or off by alternate occurrences of the Command Operand are: "F", "H", "I", "K", "M", "U", and "¢".

Examples of Command Words

1. MEN ARE SLOW)L TO GRASP NEW IDEAS;

"to grasp" begins a new column-line.

2.)LTTTU¢ NOW)U¢ IS THE TIME.

A new line is begun, and beginning at the third tab position is printed: NOW is the time.

3. Note that ")CP" (meaning "begin next text column" followed by "start a new paragraph") does not produce the same effect as ")PC", which is effectively the same as ")C". This is because the "P" begins a paragraph, but the following "C" immediately starts a new column. Because "C" ends the column-line on which it occurs, the indent (if any) at the start of the paragraph was lost.

4.)M *)L ***)L *****)L *******)L *****)L ***)L *)M
This produces:

```
      *
     ***
    *****
   *******
    *****
     ***
      *
```

5. The text "blank) blank" is valid, and is not interpreted as the beginning of a command word. Thus, "(A+B) * C" produces: "(a+b) * c", but "(A+B)* C" produces "(a+b)* c" and an error diagnostic (code 700) for an undefined Command Operand [the "*"]. (The diagnostic listing at the end of this manual shows how the above error was diagnosed.)

6. The text ")¢ FORMAT,)¢" produces: "FORMAT," but the text ")¢ FORMAT)¢," produces: "FORMAT ," and a diagnostic message for an undefined Command Operand, the comma. Thus, punctuation characters such as commas and periods should be placed immediately after the text word they would normally

follow, and any Command Words should then follow the blank after the punctuation character.

7.)H2 TEXT ... TEXT)H

This text material illustrates delayed column indentation, produced by Command Operand "H". Note that either one of the margins, or both margins (as in this example), can be drawn in, as the user desires. In this example, the second pair of column indentations was "(5,5)", so that both margins were indented 5 spaces. Note also that the final "H" could have been "H2".

8.)I3 TEXT ... TEXT)I3

This text material illustrates immediate column indentation, produced by Command Operand "I". In this example, the third pair of column indentations was "(5,0)", so that only the left margin was indented 5 spaces. The extra indent of the first line occurred because a paragraph was started by a "P" Command Operand.

9.)W10JJJJJJJJJJ

A block of 10 blank column-lines is left in the same text column (assuming of course that the "SPACING OF TEXT LINES" is 1). This is useful for the later insertion of a photograph, for example.

V. Special Operands for Capitalization and Special Characters, and the Non-Trivial Blank

FORMAT can produce upper and lower case and special characters in two ways. If the text input is punched with the Hollerith codes representing the characters desired (such as are produced by a terminal or by an upper and lower case keypunch, for example), the proper character representations on output are supplied directly by the hardware of the computer system. If, however, an upper and lower case keypunch or terminal is not used (or approximated by multi-punching on a standard keypunch), then upper and lower case and special characters can be produced using the Special Operands.

There are two Special Operands for use with standard IBM 029 and 026 type keypunches. "¢" is used for capitalization and numeric superscripts, and "!" is used to produce special characters. Both Special Operands are valid in "as-is" text mode. It is important to remember that neither of the Special Operands needs to be preceded by the ")" escape character.

The "¢" Special Operand:

A letter preceded immediately by "¢" is printed in upper case, a number so preceded is printed in superscript form, and any other symbol so preceded is printed preceded by the graphic "¢". If one of the "SPECIAL" control cards is in effect the translation of a number to a superscript is not made, unless only the "SPECIAL KEYPUNCH IS A 2741" has appeared. The "¢" Special Operand may be preceded by any character. The "¢" character must be multi-punched on an IBM 026 type keypunch. (Note that the "¢" Command Operand causes all following letters to be capitalized, whereas the "¢" Special Operand causes only the single, immediately following, letter to be capitalized. Refer back to the sample input in Section II for an example.)

The "!" Special Operand

A special character is defined as one which is neither a letter nor a number (normal or superscript) nor one of the following: *$.-,/. A special character is produced whenever the string of characters "!nn" is used, where nn is any number from 10 to 51: for example, !28 produces "¤". If nn is not in the range from 10 to 51, then "!nn" is printed.

The correspondence between the values for nn, the TN Print Train graphics, the EBCDIC hexadecimal character codes, and the punched card codes is shown below.

Nn	TN	hex	Card Code
10	‹	8D	12-0-8-5
11	›	9D	12-11-8-5
12	+	8E	12-0-8-6
13	−	A0	11-0-8-1
14	{	8B	12-0-8-3
15	}	9B	12-11-8-3
16	[	AD	11-0-8-5
17	]	BD	12-11-0-8-5
18	≤	8C	12-0-8-4
19	≥	AE	11-0-8-6
20	±	9E	12-11-8-6
21	≠	BE	12-11-0-8-6
22	⌞	AB	11-0-8-3
23	⌟	BB	12-11-0-8-3
24	⌜	AC	11-0-8-4
25	⌝	BC	12-11-0-8-4
26	∔	8F	12-0-8-7
27	—	BF	12-11-0-8-7
28	▫	9C	12-11-8-4
29	▪	9F	12-11-8-7
30	•	AF	11-0-8-7
31	°	A1	11-0-1
32	&	50	12
33	|	4F	12-8-7
34	¬	5F	11-8-7
35	<	4C	12-8-4
36	=	7E	8-6
37	>	6E	0-8-6
38	+	4E	12-8-6
39	(	4D	12-8-5
40	)	5D	11-8-5
41	"	7F	8-7
42	'	7D	8-5
43	¢	4A	12-8-2
44	#	7B	8-3
45	%	6C	0-8-4
46	@	7C	8-4
47	_	6D	0-8-5
48	;	5E	11-8-6
49	:	7A	8-2
50	?	6F	0-8-7
51	!	5A	11-8-2

It should be noted that the special characters from nn = 32 through nn = 51 can be punched directly on the standard IBM 029 Keypunch, that the "!" character itself must be multi-punched on an IBM 026 type keypunch, and that !43 is not equivalent to either the "¢" Special Operand or the "¢" Command Operand.

The Non-Trivial Blank

The character produced by punches in the 0, 8, and 2 rows of a single card column (which has EBCDIC representation E0) is replaced by a "non-trivial" blank; i.e., one which is never eliminated by the program. The IBM 029 Keypunch has a key which provides this configuration of punches directly. The non-trivial blank is treated in all respects as if it were a non-blank character except that it may or may not be the first or last character underlined, and it may or may not be considered for centering purposes, both depending on the "NULL CHARACTER SWITCH" setting.

When using an input device such as a 2741 terminal which has no provision for entering the non-trivial blank, a special technique is available, through the use of the "NONTRIVIAL BLANK" control card. For example, if the input text contains no "&" characters, then the control card

```
NONTRIVIAL BLANK REPRESENTED BY 32 (&)
```

would cause subsequent appearances of &'s to be changed to non-trivial blanks, until the next "NONTRIVIAL BLANK" control card. Thus, if the "NULL CHARACTER SWITCH" is set to 1, the input text

```
)LLM <----|&&&&& )L &&&&&|----> )LLM
```

would cause the printed result to appear as shown below.

```
<----|
     |---->
```

If the "NULL CHARACTER SWITCH" had been set to 2, then the result would have appeared as follows:

```
<----|
     |---->
```

since the non-trivial blanks at the end of the first group of characters would not be ignored for centering.

Examples of the Usage of Special Operands

For these examples, it is assumed that "SPECIAL KEYPUNCH" and "SPECIAL PRINT TRAIN" are not in effect. Thus the input is in upper case, and the results will be in lower case unless a Command Operand or a Special Operand forces capitalization.

1. ¢1 produces: ¹
2. ¢P¢I*R¢2 produces: PI*r²
3.)¢ PI*R2)¢ produces: PI*R2
4.)¢ PI*R¢2)¢ produces: PI*R²
5.)F TEXT1 ... TEXTN)F produces: Text1 ... Textn
6.)F TEXT¢1 ... T¢EXTN)F produces: Text¹ ... TExtn
7. D¢X¢2/D¢2¢Y produces: dX²/d²Y
8. ¢E!10¢2!12¢3!11 produces: E(2+3)
9. 6! produces: 6!
10. 6!51 produces: 6!
11. ¢I WISH ¢I HAD 53¢! ¢ produces: I wish I had 53¢!
12. ¢ONCE ¢I HAD 25!43!48 ¢NOW IT!42S GONE.
    produces: Once I had 25¢; Now it's gone.
13. !52 produces: !52
14. !6 produces: !6
15. !24!27!25)L |¢X|)L !22!27!23 produces:

    ⌜ ⌝
    |X|
    ⌞ ⌟

16. !14x|x!210!15 produces: {x|x≠0}

VI. The Editor Facility

The Editor facility can be used to change, override, copy, combine, list, and punch card image data sets; it can also locate words, phrases, and character strings within the text. The card image datasets read and written by the Editor will be called "tape datasets"; these will usually have been created initially by use of the "CREATE A TAPE", "LIST THE INPUT DATASET", or "PUNCH THE INPUT DATASET" control cards. The tape datasets may contain portions of jobs, whole jobs, or multiple jobs. We will refer to the input dataset to be edited as the "old master", and to the resulting output dataset as the "new master". The new master is constructed with all unneeded blanks removed, in the same "condensed" form as a dataset created by the "CREATE A TAPE" control card.

The functions provided by the Editor are requested by using a single Editor control card group, which must be the first and only control card group of the job, and which must be read from the System Input dataset. (See Section VII.) This Editor control card group must begin with the "EDITOR" or "TAPE INPUT" control card, which is then followed by the desired Editor control cards and modifications to the old master (if any), and it must end with the "GO" control card. FORMAT determines from the presence of the "EDITOR" or "TAPE INPUT" control card that an edit phase is to precede the document phase of the run. If the user requests an edit phase, then the subsequent document phase will use the result of the edit phase as its input; in addition, there can be no further document or edit phases. When the end of the Editor control card group is reached, no further reference will be made to the System Input dataset.

An error detected by the Editor means that the newly edited document will not be produced; however, the edit continues in order to detect as many errors as possible. It is clear that user errors make it impossible to know the intention of the user, and FORMAT therefore makes assumptions wherever necessary so that it can continue the edit. Thus, errors detected after the first error may be due to the assumptions made by the program, and not due to the user. Whether or not errors occurred during the edit, FORMAT always gives a listing of all the control card groups used, and a set of diagnostics if any were generated.

At the conclusion of an error-free edit, the document is produced from the new master, unless otherwise specified (see the *"$NO DOCUMENT"* Editor control card), and the Editor control card group will appear first when the control card groups are

printed following the document. In the upper far right corner of each page of the document, FORMAT will print the first and last card image numbers from the new master that were used in producing that page. A listing of the latest tape input dataset (as described in the discussion of the "CREATE A TAPE" control card in Section III) is produced after a successful edit if the Editor control card group is begun by the "EDITOR" control card.

The Editor control cards are completely free-form, as described at the beginning of Section III. All Editor control cards (except "GO") begin with a "$", which distinguishes them from ordinary control cards. During the edit phase, ordinary control cards are simply data to be edited from the old master, or added to the new master. Thus, the "EDITOR" and "TAPE INPUT" control cards are ordinary control cards; they simply initiate the edit phase. Due to a machine-dependent internal storage limitation, no Editor control card operand may exceed 32,767. The Editor control cards are described in the following paragraphs, and some examples of Editor control card groups will be given at the end of this section.

Editing the Old Master

Three Editor control cards are user to modify the tape input dataset (the old master) and produce a new tape input dataset (the new master): they are "$INSERT", "$DELETE", and "$END CHANGES". Before describing the function of each control card in detail, we will give a brief description of the editing process itself.

To perform these functions, FORMAT first reads an Editor control card from the System Input dataset to determine the editing function desired. Material is then copied from the old master to the new master until the Editor finds the position on the old master where the insertion or deletion is to occur; this position is called the "edit point". After deleting material from the old master (if requested), FORMAT inserts new material (if provided) into the new master, until it encounters the next Editor control card.

In this way, FORMAT obeys each of the Editor control cards in turn, reading card images from the old master and writing card images on the new master. Since the old master contains data which can be used in the document phase, it can be read by the Editor in two ways: normal text, which runs freely from card image to card image, and single card images (ordinary control

cards, and "as-is" text cards). Thus, whereas the document phase reads its input in three modes (ordinary text, as-is text, and control card), the edit phase reads the old master and writes the new master in only two modes. These will be called word mode (containing the text of titles and footers, and ordinary text), and card mode (containing as-is text and ordinary control cards). Diagnostic 806 or 814 (see Section XII) is issued if a mode error occurs.

The old master (preferably file-protected) is read from dataset reference number 2, and the new master is written on dataset reference number 4. It is important to remember that the edit phase, unlike the document phase, reads from two sources: from the System Input dataset, which contains Editor control cards and changes to the old master; and from the old master, which is to be edited according to the instructions in the Editor control card group.

We will now describe the three Editor control cards used to perform the editing functions.

$INSERT BEFORE CARD IMAGE a WORD b

The contents of the cards (if any) between this Editor control card and the next Editor control card are inserted into the new master at the specified edit point, which is determined as follows:

1. If the insertion refers to text or titles (the old master is being read in word mode), then the edit point is just before word b on card image a of the old master (where b is a count of only those words begun on card image a, and must be other than blank or zero).

2. If the insertion refers to "as-is" text or control cards (the old master is being read in card mode), then the edit point is just before card image a, and b must be blank or zero. (In card mode, insertions are made one card image at a time, and do not depend on the words on the card.)

The values of a (card image numbers) and b (numbers of text and title words begun on that card) to be used with the old master are found in the listing produced when the old master was created or last edited.

The cards containing the material to be inserted should be prepared in the same way as ordinary text, title, "as is", or control cards, as though the "CARD FIELD THRU 80" and "029

KEYPUNCH" control cards are in effect. These two control cards also pertain to the new master, because the "026 KEYPUNCH", "029 KEYPUNCH", and "CARD FIELD" control cards will be ignored as insertions. The "CONTROL CARD ENDS IN" control card may be inserted, and it will take effect during the edit.

$DELETE CARD IMAGE a WORD b
or
$DELETE CARD IMAGE a WORD b THRU CARD IMAGE c WORD d

The contents of the cards (if any) between this Editor control card and the next Editor control card are inserted into the new master at the edit point. Then, the material in the old master from a,b through and including c,d (if specified) is skipped over, and it will not appear in the new master. The description of the $INSERT card applies, with the remarks concerning the value of b also applying to the value of d. If it is desired to delete from a,b to the end of the old master, the value 32767 may be given to c to reduce run time (no operand is required for d).

With a single exception, each $INSERT and $DELETE Editor control card must refer to an edit point in the old master beyond the last point referenced. The one exception to this rule is that multiple successive $INSERT references to the same a and b are allowed; the insertions will appear in the same order in the new master.

No $INSERT or $DELETE control card can be allowed following a $DUPLICATE or $END CHANGES control card, because each of these places the edit point at the end of the old master, beyond which there is no legitimate point. No $INSERT or $DELETE control card is allowed in the same Editor control card group with $MERGE or $JOIN control cards; that is, changes and merges must be accomplished in separate runs.

$END CHANGES

This control card is required following the last $INSERT or $DELETE control card, unless the end of the old master has been reached. It completes the new master by adding to it the unreferenced last portion of the old master. This control card is ignored when not required (that is, when the end of the old master has been reached).

Combining Data Sets

To combine tape input datasets into a single new tape input dataset (the "new master"):

$MERGE TAPE INPUT DATASETS ON x1,...,x8

The new master is produced at dataset reference number 2 and is an unchanged concatenation of the tape input datasets at the dataset reference numbers given in the operand field, in the order in which they are given. Up to eight dataset reference numbers may be specified in any order, and any may be specified more than once for multiple copies of particular tape input datasets. The valid dataset reference numbers are 9 and higher, and 4. The user must determine that all dataset reference numbers used have been generated into the operating system being used.

As many $MERGE and $JOIN control cards as desired may be used. No $MERGE or $JOIN control card is allowed in the same Editor control card group with $INSERT, $DELETE or $DUPLICATE control cards; that is, merges must be accomplished in a separate run from changes and duplication.

It is good practice that the tape input datasets be file-protected.

$JOIN TAPE INPUT DATASETS ON x1,...,x8

This control card produces a resultant new master like the one produced by the $MERGE control card, with one difference: all document-ending "E" Command Operands encountered on the tape input datasets referenced are changed to "V" Command Operands, except for those on the last dataset referenced. The effect of this is to combine the input for many jobs into input for one new job.

The remainder of the description of the $MERGE control card applies to this control card.

Other Editor Control Cards

$DUPLICATE OLD MASTER

The old master is copied from the position at which the last $INSERT or $DELETE control card has left it; or, if no position was specified, from the beginning. The old master (preferably file-protected) is mounted at dataset reference number 2, and the copy is written at dataset reference number 4. This control card may be used to complete a new master begun by $INSERT and $DELETE control cards.

The $DUPLICATE control card is not allowed in the same Editor control card group with $MERGE or $JOIN control cards.

$NO DOCUMENT

This control card prevents production of the edited document, which otherwise follows a successful edit run. Any listing, punching, overriding, locating, and dictionary functions that may have been requested concerning the latest tape input dataset are unaffected.

$OVERRIDE FIRST CONTROL CARD GROUP

The following cards (up to the next Editor or "GO" control card) are control cards which will override the first control card group on the tape input dataset when it is used to produce the document. No "TITLE" or "FOOTER" control card may override. No physical change is made to either master. FORMAT saves the overriding control card group, and uses it as part of the first group read from the just-completed new master at the start of the document phase. The overriding control cards will be inserted just before the first "TITLE", "FOOTER", or "GO" control card in the overridden group.

$PUNCH

At the conclusion of the successful edit run and after the edited document is produced or bypassed, this control card results in the latest tape input dataset being copied onto the System Punch dataset.

$LIST

This control card forces a listing of the new master (if any) at the conclusion of an edit run, successful or not. Following an unsuccessful edit, the listing is in upper case. In the listing, the Command Operands that appear on each card image are reiterated alongside the card images, in the right-hand portion of the page. This allows one to find Command Words rapidly, and to locate desired areas of the input text. Those symbols for which no graphics are expected are printed as asterisks in the listing.

$OMIT LISTING OF NEW MASTER

The presence of this control card in the group of Editor control cards will suppress the listing of the new master following a successful edit. The default action is to produce the listing.

The production of a listing depends on a number of factors. If the Editor control card group was begun with the EDITOR control card, then a listing will be produced only if the edit was successful (in the absence of a $LIST Editor control card). If the Editor control card group was begun with the TAPE INPUT control card, then a listing is provided only if the $LIST Editor control card is included in the Editor control card group. The $OMIT LISTING Editor control card always deletes the listing.

FORMAT will usually diagnose editing errors so that the cause of the error can be identified readily. If errors are expected, it is sometimes helpful to include the $LIST Editor control card in the Editor control card group; the listing can then be scanned to see what actions were taken by FORMAT in handling the errors.

$LOCATE THE FOLLOWING WORDS/PHRASES/STRINGS

This facility is intended primarily to assist in the task of index production; see the "DICTIONARY" control card also. The following cards (up to the next Editor or "GO" control card) contain arguments to be located (by card image number) in the latest input stream, according to the following rules:

- one search argument per card
- non-alphamerics not b+-/*$ (b = blank) are ignored both in search arguments and in the text stream

- blanks are word delimiters only, both in search arguments and in the text stream
- a final non-blank character of "+" in a search argument means that all strings consisting of the preceding characters are to be located
- all blank search arguments, duplicate search arguments, and arguments consisting of a single "+" are ignored; a "+" in a search argument is ignored if the preceding string consists solely of a single character
- search arguments may be in any order
- a non-trivial blank in the input stream is treated as an ordinary blank, but a non-trivial blank in a search argument is not changed; thus, no strings can be located that match a search argument containing a non-trivial blank
- only ordinary and "as-is" text are searched on the input stream; Command Words, control cards, and titles are not
- comparisons are made on an upper case basis; if text or search arguments contain lower case letters, they are converted to upper case for the comparison
- dataset reference number 3 is required (see Section IX)

FORMAT scans the input text for words and strings that match a search argument, and accumulates as much data as it can hold before writing any output. When its tables are full (or when all the input text has been scanned), the program writes the results on the System Output dataset in alphabetic order, for that section of the input text, with the locations of the matching strings in ascending order of input card image number. The scan of the input text then begins again, if necessary.

A search argument with a non-letter as one of the first two characters is positioned at the beginning of the entries for the letter of the first two characters. Thus, the located strings which match "A*" and "*A" would both be found at the start of the list of search arguments beginning with the letter "A". A search argument which cannot be found is so annotated.

If the number of $LOCATE arguments is too large, FORMAT will print a message on the System Output dataset, giving the number of the $LOCATE argument which caused the table overflow. It and the remaining arguments can then be located in a subsequent computer run.

Examples of Editor Control Card Groups

```
EDITOR
 $DELETE 10 5              (delete a single text or title word)
         ¢THE COMPUTER     (inserted text)
 $INSERT 15                (insert before control card)
       LINES/PAGE = 70     (inserted control card)
 $DE     16 0 18 6         (delete control cards and text)
         GO                (inserted control card)
         )P ¢THE DATA      (inserted text)
 $END CHANGES
 $PUNCH
 $LIST                     (force listing of new master)
GO

   (This group will produce only a dictionary)
EDITOR
 $DUPLICATE OLD MASTER
 $NO DOCUMENT
 $OVERRIDE AND PROVIDE A
    DICTIONARY             (override is just this one card)
GO


TAPE INPUT DATASET
 $OVERRIDE CONTROL CARDS
  COLUMNS/PAGE = 2
  SPECIAL PRINT TRAIN
  LIST THE TAPE
 $LOCATE THE FOLLOWING:
    TAPE+                  (locates "tape", "tapestry", etc.)
    CONTROL CARD+
    OLD MASTER
    CARD IMAGE+
    COLUMN-LINE
    RIGHT JUSTIFICATION
    TEXT PROCESSING PROG+
GO

   (This group combines 3 tapes and punches the result)
EDITOR
 $PUNCH
 $OMIT THE LISTING OF THE NEW MASTER
 $JOIN TAPE DATASETS 4, 10, AND 9
GO
```

VII. Rules for Using FORMAT

A. General:

1. Each FORMAT job must begin with a control card group (the minimum control card group consists of the "GO" control card).

2. Title, footer, and text input must appear in the field specified on the "CARD FIELD" control card, or, if not used, in the default card field (card columns 1 through 80).

3. A FORMAT job is ended by the appearance of the "E" Command Operand. Multiple FORMAT jobs may be stacked one behind the other. If mixed card and tape resident jobs are to be run, the card jobs must precede the tape jobs (including an edit job); the card jobs must not use dataset reference number 2, however.

4. Command Words may appear freely interspersed throughout text and titles. Although no text or title word may begin with a ")" character [nor the appropriate "!nn" configuration for ")"], the ")" may be used textually when followed by a blank.

B. Titles and Footers:

1. The card images containing the title must immediately follow the "TITLE STARTS ON" control card and must be immediately followed by either the "FOOTER" or the "GO" control card.

2. The card images containing the footing title must immediately follow the "FOOTER" control card and must be immediately followed by either the "TITLE" or "GO" control card.

3. The "L", "F", "ℊ", and "E" Command Operands may be used in titles.

4. The text of a title or footer must be ended by the Command Operand "E".

5. The "L" Command Operand always acts as if single spacing were in effect, regardless of the operand field on the "SPACING OF TEXT LINES" control card (or its default). The "E" Command Operand, in addition to ending the title, also single spaces. Thus:

```
TITLE LINE 1 )LL TITLE LINE 2
```

results in exactly one blank line between title lines, while

```
LAST TITLE LINE )LLE
```

results in a minimum of two blank lines separating the last title line from the body of the document.

6. Each title line begins in the print position specified (or the default, position 1) and ends when a Command Word containing either the "L" or "E" Command Operand is encountered, or else when the title line attempts to exceed the last printer position allowed to the line.

7. No right-justification is accorded to titles, since no right-most title limit is defined.

8. All hyphens appearing in titles are printed. Excess blanks are ignored. Special spacing may be achieved with non-trivial blanks.

9. The Special Operands may be used in titles.

C. Body of the Document:

1. Input blanks between words serve only as word delimiters (unless operating in the "as is" mode). Words are separated by a single blank, plus the number of blanks required to accomplish right-justification, if in effect (see the "JUSTIFICATION" control card for details).

2. Hyphens are not automatically introduced by FORMAT. A hyphen in the input stream is printed, and may be selected to be the last character on a column-line.

VIII. Summary of FORMAT Control Cards and Command Operands

The control cards are grouped below by the options to which they refer. Thus, the "JUSTIFICATION" and "NO JUSTIFICATION" control cards are paired because each refers to the right-justification option. Within each group certain default values will be assumed if no control card from that group is used.

Control Cards	If Omitted
BACKSPACE CHARACTER IS SPECIAL CHARACTER nn	.....no backspaces
BETWEEN COLUMNS LEAVE x BLANKS	.....x=2
CAPITALIZE AUTOMATICALLY NO CAPITALIZATION AUTOMATICALLY	.....assumed
CONTROL CARDS END IN COLUMN x	.....x=80
CARD FIELD IS x THRU y CARD FIELD EXTENDS THRU y	.....x=1, y=80
CENTER TEXT ON LINE x	.....x=5
START TEXT ON LINE x IN PRINT POSITION y TEXT STARTS ON LINE x IN PRINT POSITION y	
COLUMNS PER PAGE = x	.....x=1
COPIES = x	.....x=1
DARK PRINT EACH PAGE x TIMES	.....x=1
OUTPUT MEDIUM IS TAPE PRINT OUTPUT TAPE	
CREATE A TAPE FROM CARD INPUT LIST THE INPUT DATASET PUNCH THE INPUT DATASET	
CYCLE THE PAGE NUMBER LEFT TOP POSITION FOR PAGE NUMBER PAGE NUMBER STARTING AT x RIGHT TOP POSITION FOR PAGE NUMBER	.....x=1 .....assumed

DICTIONARY OF WORDS USED

DROP CHARACTER FOR 'D' COMMAND IS x .....x=75 (dots)

TAPE INPUT DATASET
EDITOR
  $INSERT
  $DELETE
  $END CHANGES
  $MERGE TAPES
  $JOIN TAPES
  $DUPLICATE OLD MASTER
  $NO DOCUMENT
  $OMIT LISTING OF NEW MASTER
  $OVERRIDE
  $PUNCH
  $LIST
  $LOCATE

FOOTER ON LINE x POS'N y AFTER z BLANK LINES
TITLE STARTS ON LINE x IN PRINT POSITION y

GO .....error

INDENT COLUMN (x1,y1),...,(x7,y7) POSITIONS .....x's,y's = 0

JUSTIFICATION .....assumed
NO JUSTIFICATION

LINES PER PAGE ARE x .....x=59

NONTRIVIAL BLANK REP'D BY SPECIAL CHAR nn .....nn=0
NULL CHARACTER SWITCH SET TO x .....x=1

PARAGRAPH INDENT IS x PRINT POSITIONS .....x=5

REPEAT TITLE ON EVERY PAGE
STOP PRINTING TITLE .....assumed

SENTENCES SEPARATED BY AT LEAST x SPACES .....x=1

SEPARATION LINES BETWEEN PARAGRAPHS ARE x .....x=1

SIDE BY SIDE COPIES

SPACING OF TEXT LINES IS x .....x=1

SPECIAL KEYPUNCH
SPECIAL KEYPUNCH IS A 2741

SPECIAL PRINTER TRAIN

TABS ARE SET AT x1,...,x14 .....tabs set to 0

UNDERLINE SWITCH SET TO x .....x=0

WIDTH OF COLUMNS IS x PRINT POSITIONS .....x=64

026 KEYPUNCH
029 KEYPUNCH .....assumed

Command Operands [Format of Command Words is ")X...Y "]

```
A -- enter "as is" mode
C -- begin a new column
D -- tab to next tab stop, dropping dots
Dn-- tab to n-th tab stop, dropping dots
E -- end the title or the footer, or end the job
F -- capitalize first letters of words / stop
Hn-- indent (delayed) column using nth pair / restore
In-- indent (now) column using nth pair / restore
J -- always begin a new column-line
K -- keep the enclosed text in one text column
L -- begin a new column-line when not at top of column
M -- center text within the column-line / stop
P -- begin a new paragraph
S -- begin a new page
T -- tab to next tab stop
Tn-- tab to n-th tab stop
U -- underline / stop underlining
V -- read in the next group of control cards
Wn-- keep the next n lines in the same column
¢ -- print in upper case only / stop
```

! Special Operand Values [Format is "!nn"]
(TN Print Train graphics shown)

```
n 111111111122222222223333333333444444444455
n 012345678901234567890123456789012345678901

  ()+-{}[]≤≥±≠⊔⊓+-□●•°&|¬<=>+()"'¢#%@_;:?!
```

The EBCDIC card code for "¢" is: 12-8-2
The EBCDIC card code for "!" Is: 11-8-2

IX. Datasets Used by FORMAT

The correspondence between dataset reference numbers (DRN) and system dataset names (which are used in the name field of system control cards) is as follows:

DRN	OS/360
1	FT01F001
2	FT02F001
3	FT03F001
4	FT04F001
5	FT05F001
6	FT06F001
7	FT07F001
8	FT08F001
above	FTxxF001

Dataset reference numbers 5, 6, and 7 are assumed to apply respectively to the System Input dataset, the System Output dataset, and the System Punch dataset.

The user must verify that the dataset reference numbers he uses are in fact available; i.e., that they have been generated into the operating system in use at his installation.

All datasets created and used by FORMAT are formatted, sequential, and fixed length, and may be defined as blocked, if operating under Release 18 or later releases. This restriction in earlier releases is due to Data Management's inability to backspace a blocked dataset and not to the logic of this program. If blocked datasets are used with releases prior to 18 the results will be unpredictable.

Labeled tapes can be used by the program providing that they are acceptable to the operating system used. Labeling of tapes, if desired, is the responsibility of the user.

Before a file-protected tape can be read by OS/360, the message "xx IEC103D F" is typed on the console. The operator must respond with "reply xx,'U'", where xx is the on-line message number.

Under OS/360 the number of I/O buffers may be 1 or 2. The higher number is always preferable unless there is difficulty fitting the program into memory, in which case the number 1 should be specified where necessary; however, performance may be somewhat degraded.

All datasets created by FORMAT are ended by an "end-of-file" mark.

The following describes the datasets created and used by FORMAT:

Dataset Reference Number 1:

This dataset records control cards, user errors, and other information, and is always required. It may be direct access device or tape resident. Its record length is 97 bytes.

Dataset Reference Number 2:

This dataset is required only if one or both of the following apply:

1. "EDITOR", "TAPE INPUT", "CREATE A TAPE", "DICTIONARY", "LIST", and/or "PUNCH" has been specified
2. The Command Operand "K" has been used

This dataset is a card image set which may be resident either on tape or on a direct access device. If the Editor facility is being used, tape is preferable since the user may wish to keep this dataset, file-protect it, and use it again as an input dataset master.

Dataset Reference Number 3:

This dataset is required only if "DICTIONARY" or "$LOCATE" has been specified. It contains 80 bytes per record and may be tape resident or (preferably) on a direct access device.

Dataset Reference Number 4:

This dataset is only required when producing a "new master" input dataset (or a duplicate of the "old master") in an edit run. It may also be (but not in the same run) an input dataset to be $MERGEd or $JOINed in an edit run. Its specifications are identical to those for dataset reference number 2.

Dataset Reference Number 5:

This is the System Input dataset and is always required by the program. Its record length is always 80 bytes.

Dataset Reference Number 6:

This is the System Output dataset and is always required by the program. Its record length is 133 bytes, and ASA standard control characters are used.

Dataset Reference Number 7:

This is the System Punch dataset, and is only required if punched output has been requested. Its record length is always 80 bytes.

Dataset Reference Number 8:

This dataset is only required by FORMAT if any of the following control cards is specified:

```
OUTPUT IS TAPE
COPIES = 2 (or more)
PRINT OUTPUT TAPE
```

This dataset is a printer image (133 bytes per record) set which can be tape or direct access device resident.

Dataset Reference Numbers Above 8:

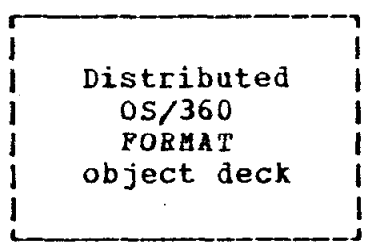
These may be used as input datasets to be $MERGEd or $JOINed in an edit run. The specifications for these datasets are identical to those for dataset reference number 2.

X. Description of FORMAT for OS/360 and Suggested Control Cards

The distributed System/360 FORMAT object deck (produced by the Fortran H compiler) is set up to run as an OS/360 overlay job (the OVERLAY cards are included in the deck, but may be removed to run FORMAT in-line). As an overlay job it requires 48,648 (hex BE08) bytes of memory, including the subroutines from the full Fortran library of OS/360 Release 18 with the Fortran Extended Error Handling facility (but not including I/O buffers). FORMAT requires a minimum 64K System/360 or System/370 computer. In non-overlay form FORMAT requires a minimum of 79,272 (hex 135A8) bytes; it will run somewhat faster because fewer I/O operations will be required.

A suggested FORMAT run setup is as follows (note that the asterisks along the right margin are supposed to appear in column 72 of the JCL statements). The blocksizes for Dataset Reference Numbers 1, 3, and 8 were chosen to optimize storage space usage on a 2314 Direct Access Storage Facility.

```
//FORMAT JOB ____
//LKED EXEC PGM=IEWL,PARM='OVLY,XREF,LIST'
//SYSPRINT DD SYSOUT=A
//SYSLIB DD DSNAME=SYS1.FORTLIB,DISP=OLD
//SYSUT1 DD DISP=(,DELETE),UNIT=2314,SPACE=(CYL,(3,2))
//SYSLMOD DD DSNAME=GOSET(MAIN),DISP=(NEW,PASS),UNIT=2314,     *
//             SPACE=(TRK,(12,2,2)),VOLUME=SER=______
//SYSLIN DD *
```




```
/*
//GO EXEC PGM=*.LKED.SYSLMOD
//FT06F001 DD SYSOUT=A
//FT07F001 DD UNIT=SYSCP
//FT01F001 DD UNIT=SYSDA,DISP=(,DELETE),SPACE=(CYL,(3,1)),     *
// DCB=(RECFM=FB,LRECL=97,BLKSIZE=7275,BUFNO=2)
//FT03F001 DD UNIT=2314,DISP=(,DELETE),SPACE=(CYL,(6,1)),      *
//             DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=7280)
//FT02F001 DD UNIT=(___,,DEFER),LABEL=(,NL),                   *
//             VOLUME=(,RETAIN,,,SER=OLDMAS),                  *
//             DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=8000)
//FT04F001 DD UNIT=(___,,DEFER),LABEL=(,NL),                   *
```

```
//              VOLUME=(,RETAIN,,,SER=NEWMAS),                    *
//              DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=8000)
//FT08F001 DD UNIT=(___,,DEFER),LABEL=(,NL),                       *
//              VOLUME=(,RETAIN,,,SER=OUTPUT),                     *
//              DCB=(BUFNO=2,RECFM=FBA,LRECL=133,BLKSIZE=3458)
//FT05F001 DD DATA
```


```
/*
```

Of the datasets defined above, only FT01F001, FT05F001, and FT06F001 are always required. See Section IX for more information.

The FORMAT distribution tape consists of three files written at a recording density of 800 BPI on a 9-track tape, with no labels. All logical records are 80 bytes long, and each physical record is 1600 bytes long. The first file contains the object deck (including Linkage Editor control statements); the second file contains the FORMAT job which produces this manual; the third file contains the Fortran source statements from which the object deck was produced.

XI. Hints and Suggestions

A. Document Phase

1. The TITLE and FOOTER control cards, along with their following title and footer texts, must be the last control cards to appear in a control card group before the GO control card.

2. If the text for a title or footer is not ended with the ")E" Command Operand, FORMAT will search for it by including as much of the following material as possible into the "title". This naturally leads to a document of unusual proportions.

3. When ending an "as-is" region (initiated by the "A" Command Operand), the card containing the ") " in the initial columns should contain no other text.

4. If an erroneous control card is found, it is treated by FORMAT as a "GO" card. This means that any following control cards will be read in text mode; in particular, if a "TITLE" card follows the bad control card, the ")E" that ends the title (or footer, of course) will appear to be the ")E" that ends the text input.

5. When setting up tab stops and column indents, remember that a tab stop in (say) column 10 is equivalent to an indent of 9 spaces -- that is, the line position where the text will begin after indenting is 1 larger than the number of spaces indented.

B. Edit Phase

1. A successful edit does not imply a successful document, since conflicting information may have been edited into the new master.

2. Control cards written onto the new master are under control of the

CONTROL CARD ENDS IN COLUMN nn

card currently in effect.

3. During an edit, the method used to search for Editor control cards can occasionally cause a non-control card to be mistaken for an Editor control card. (During an edit, each card in the Editor control card group must be checked to see if it is an Editor control card, or text to be inserted into the new master.) The valid Editor control card characters are shown in the leftmost column of the table below; the invalid combinations that will be mistaken for the valid combinations are shown in the right columns.

Valid	Invalid
$ME	$J5 $KV $LN
$OV	$N5 $PN $QE
$DE	$A5 $CN $BV
$IN	$G5 $HV
$EN	$C5 $FE $DV
$DU	$C4 $EM $FD
$PU	$O4 $QM $RD
$NO	$L6 $MW $OE
$LI	$KR $JZ
$LO	$KW $J6
$JO	$KF
$OM	$M4 $NU $PD

Editor Control Card Equivalences

To avoid such errors, (1) arrange the text to be inserted so that the first nonblank character on the input card is not a "$", or (2) be sure that the first three characters are not one of the invalid combinations.

4. The DICTIONARY feature requires that the source text be in upper case; text entered with the "SPECIAL KEYPUNCH" control card in effect may not be processable by this facility.

XII. Error Handling and Diagnostic Messages

With the exception of errors made during an edit run, user errors do not abrogate the document. When a user error is found, the program notes the error, assumes appropiate values for the erroneous data, and continues. The Editor does not allow a document to be produced unless the edit was error-free; however, the edit itself continues to completion regardless of user errors.

The error diagnostics (if any) are written onto the System Output dataset at the conclusion of each job. Each diagnostic consists of a textual description of the error and the page number, column number, and line number being produced when it occurred. If the error was in the input text, the character number within the line where the error occurred is given; if the error occurred within a control card group, then the group number is given; and if the error can be localized to a particular control card or Editor insertion card, then the card number is given. Also listed for each error is a code number that refers to a paragraph below, which gives additional information about the error and describes action taken by the program when it occurs.

212. CONTROL CARD OPERAND IN ERROR
An operand on the control card specified is outside the legal range or is otherwise in error. If the error occurs on an Editor control card, the control card is ignored. Otherwise, the previous value of the parameters involved or, if none, the default values are used.

218. UNRECOGNIZED CONTROL CARD
The specified control card is unrecognizable. It is treated as if it were the "SPECIAL PRINTER" and the "GO" control cards. If the input stream is not on the System Input dataset, it is backspaced and the unrecognizable control card is reread as text.

219. NUMBER OF PRINT POSITIONS REQUIRED NOT AVAILABLE
The number of print positions required by this control card group exceeds the number available. The document is forced leftward, the width of the text columns may be redefined to be the largest value possible, and the number of print positions between columns may be set to 2.

220* TITLE/FOOTER TOO LONG
The title or footer is not ended after the last line allotted to the page is filled. The title or footer is ended and the program looks for a control card. If issued for a title, the "STOP TITLE" control card is simulated.

237* TABS NOT IN ASCENDING ORDER
The tabs set in the specified control card group are not in ascending order. Starting with the first tab set out of order, the tabs are set to the last position on the column-line.

249* CONTROL CARD NOT FIRST, OR ON DATASET OTHER THAN 5
The "EDITOR" or "TAPE INPUT DATASET" control card specified is either not the first card of the job, or else it has been read from a dataset which is not the System Input dataset (dataset reference number 5). It is ignored, and any following Editor control cards or insertions will not be properly interpreted.

267* TAB IMPROPERLY SET
In the specified control card group a tab is set at a position beyond the end of the column-line. The erroneously set tab and the tabs which follow it are set to the last position on the column-line.

269* IMPROPER STARTING LINE FOR DOCUMENT TEXT
The body of the document is positioned improperly by the specified control card group. The corrective action taken is to begin the text immediately following the title (but not above line 5), and the text is extended through the last line on the page.

289* IMPROPER CONTROL CARD ORDER
The referenced control card is neither the "TITLE", "FOOTER", nor "GO" control card. An attempt is made to allow the present control card order.

300* INDENTS TOO LARGE
The cumulative indents in effect have reduced the effective column-line width to zero or less. All column indents are turned off at the indicated character position.

304* CHARACTER STRING LENGTH EXCEEDS COLUMN WIDTH
A string of non-blank, unhyphenated characters at the indicated character position is longer than the column-line. It is printed without hyphenation over as many lines as are required to contain it.

327. TAB COMMAND OPERAND IMPROPERLY USED
The Command Operand "T" or "D" at the indicated character position is beyond the position of any tab set, or is not to the right of the current character position, or is in an indented portion of the column-line, or an unset tab has been used. The Command Operand is ignored.

513. NUMBER OF UNDERLINE SEGMENTS ON PAGE EXCEEDS 99
At the indicated character position more than 99 column-lines, or portions of column-lines, have been underlined on this document page. Those in excess of 99 are ignored.

700. UNDEFINED COMMAND OPERAND
A Command Word at the indicated character position (before the line is justified) contains an undefined Command Operand. It, and the rest of the Command Word, are treated as text. The ")" is also printed if the undefined Command Operand is the first in the Command Word. If the error was detected during an edit, the number given for the erroneous control card will be that of the last one read before the error was detected. If the invalid Command Operand is a ")", then FORMAT will treat it as the start of a new Command Word if it is not followed by a blank.

800. UNEXPECTED END OF INPUT
An unexpected end of the input stream has occurred, caused by an omitted "GO" or "$END CHANGES" control card, or by an omitted "E" Command Operand. Some output may be lost.

802. NEW MASTER ALREADY FINISHED
An attempt has been made by the specified control card to continue the new master after the end of the old master has been reached. For example, a "$DELETE" control card may have occurred after a "$DUPLICATE" control card. The edit continues.

804. EDIT FAILED BECAUSE OF ABOVE ERROR(S) OR BECAUSE NEW MASTER NOT FINISHED
Errors already noted have occurred during the edit ended by the referenced card, or else the new master has not been ended because the end of the old master has not been reached or referenced. The job is terminated.

805. REFERENCED WORD NOT LOCATED
The word referenced on the specified "$INSERT" control card, or the first word referenced on the specified "$DELETE" control card cannot be located. The edit continues.

806* INPUT/OPERAND MODE ERROR
The mode of the operand on the specified "$INSERT" or "$DELETE" control card differs from the present mode of the new input dataset (new master). That is, a word number is specified and the new master is in an "as is" or control card region (card mode), or no word number is specified and the new master is in a text region (word mode). The edit continues.

807* END OF $DELETE FIELD NOT FOUND
The end of the field to be deleted, referenced on the specified "$DELETE" control card, cannot be located. The edit continues.

814* NON-TEXT MODE NOT ENDED
An "as is" or control card region edited into the middle of a text card image has not been ended before the specified control card. The edit continues in "text" (word) mode.

847* $INSERT/DELETE/DUPLICATE AND $MERGE/JOIN NOT ALLOWED IN SAME RUN
Editor control cards "$INSERT", "$DELETE", and "$DUPLICATE" may not appear in the same run with "$MERGE" and "$JOIN" control cards. That is, merges must be accomplished in a separate run from changes and duplication. The indicated control card is in violation of this rule. The edit continues.

857* NOT ALLOWED
The "TITLE" or "FOOTER" control card indicated is not permitted as an overriding control card. The edit continues.

922* NO TEXT AFTER TAB(S)
The last tab on the indicated line is not followed by text.

997* TOO MANY BACKSPACES ON ONE PAGE
Too many backspaces have been specified on the current page. The first 99 have been handled, but any after the 100th will be treated as normal text characters.

XIII. Appendix

The following pages were produced at the conclusion of the computer run producing this manual. The "COLUMNS PER PAGE = 9" control card, the first control card in the first control card group, is intentionally faulty, and produces the first diagnostic. The fifth example of Command Words (at the end of Section IV) produces the second.

INDEX

T

U

W

GROUP	PAGE	COLUMN	LINE	NO.	
1	1	1	0	1	COLUMNS PER PAGE = 9 (MAX IS 8; SEE FOLLOWING DIAGNOSTIC. WILL SET 1 COLUMN)
				2	START TEXT ON LINE 14, PP 12
				3	CAP OPTION
				4	LINES/PAGE = 56
				5	WIDTH OF COLUMNS IS 60 CHARACTERS
				6	PAGE NUMBER IS NULL
				7	NONTRIVIAL BLANK IS REPRESENTED BY SPECIAL CHARACTER 38 (¬)
				8	INDENT THE COLUMN (8,0), (5,5), (5,0), (3,0), (6,0), (4,0), (2,0)
				9	GO
2	3	1	14	10	START TEXT ON LINE 8 IN POSITION 10
				11	WIDTH OF COLUMNS = 64
				12	REPEAT TITLE
				13	TABS AT 8 AND 63
				14	TITLE: LINE 1, PRINT POSITION 25
				15	GO
3	4	1	8	16	BACKSPACE CHARACTER IS NUMBER 46 (@)
				17	CYCLE PAGE NUMBERS
				18	RIGHT SIDE PAGE NUMBER TO START
				19	PAGE NO. = 1
				20	GO
4	16	1	28	21	NO JUSTIFICATION
				22	GO
5	16	1	34	23	JUSTIFICATION
				24	BACKSPACE CHARACTER RESET TO 0 (TURN BACKSPACING OFF)
				25	GO
6	21	1	29	26	BACKSPACE CHARACTER IS 50 (?)
				27	GO
7	21	1	34	28	BACKSPACE 0 (RESET)
				29	GO
8	31	1	56	30	TABS ARE SET AT 20 25 30 36
				31	NULL CHARACTER SWITCH SET TO 2 (USE NONTRIVIALS FOR CENTERING)
				32	GO
9	46	1	8	33	TABS ARE AT 10 AND 50
				34	GO
10	50	1	15	35	TABS SET TO 24 33
				36	GO
11	52	1	33	37	TAB SET TO 10
				38	GO
12	56	1	22	39	TABS AT 22, 32
				40	GO

FORMAT RELEASE 5 CONTROL CARDS

GROUP	PAGE	COLUMN	LINE	NO.	
13	57	1	8	41	TAB SET AT 15
				42	GO
14	62	1	8	43	COLUMNS/PAGE =2
				44	WIDTH = 30
				45	BETWEEN COLUMNS =4
				46	PAGE NUMBER IS NULL
				47	NO CAPITALIZATION AUTOMATICALLY
				48	NO JUSTIFICATION
				49	STOP TITLE
				50	TITLE ON LINE 5
				51	GO

CODE	PAGE	COLUMN	LINE	CHAR/GROUP/CARD	ERROR
212	1	1	0	2	CONTROL CARD OPERAND IN ERROR
700	29	1	47	8	UNDEFINED COMMAND OPERAND

```
SPECIAL PRINTER TRAIN (REMOVE THIS CARD TO PRINT IN UPPER AND LOWER CASE)
COLUMNS PER PAGE = 9 (MAX IS 8; SEE FOLLOWING DIAGNOSTIC. WILL GET 1 COLUMN)
START TEXT ON LINE 14, PP 12
CAP OPTION
LINES/PAGE = 56
WIDTH OF COLUMNS IS 60 CHARACTERS
PAGE NUMBER IS NULL
NONTRIVIAL BLANK IS REPRESENTED BY SPECIAL CHARACTER 34 (¬)
INDENT THE COLUMN (8,0), (5,5), (5,0), (3,0), (6,0), (4,0), (2,0)
GO
¢THE DATA DECK GENERATING THIS MANUAL WILL PRODUCE IT IN UPPER AND LOWER CASE IF
 THE FIRST CARD, THE )¢ FORMAT )¢ CONTROL CARD )¢ "SPECIAL PRINT TRAIN", )¢ IS R
EMOVED. )S )MF THE )¢ FORMAT )¢ MANUAL )LLLL GERALD M. BERNS )JJJJJJJJJJJJ )LL
LLLLL ¢RELEASE 5 )LLLLLF ¢MODIFICATIONS AND ¢ADDITIONS BY )FLL JOHN R. EHRMAN )L
 COMPUTATION GROUP )L STANFORD LINEAR ACCELERATOR CENTER )L STANFORD, CALIFORNIA
 94305 )LLLL ¢JULY 1971 )SV
START TEXT ON LINE 8 IN POSITION 10
WIDTH OF COLUMNS = 64
REPEAT TITLE
TABS AT 8 AND 63
TITLE: LINE 1, PRINT POSITION 25
)¢ FORMAT --- )¢F A TEXT PROCESSING PROGRAM )FE
GO
)¢JJM CONTENTS )M¢LLLLLL ¢I. )T ¢SUMMARY OF ¢FACILITIES )D ¬1 )LL ¢I¢I. )T ¢INTR
ODUCTION )D ¬3 )LL ¢I¢I¢I. )T ¢CONTROL ¢CARDS )D ¬9 )L )T ¬¬¢EXAMPLES OF ¢CORREC
T ¢CONTROL ¢CARDS )D 23 )LT ¬¬¢EXAMPLES OF ¢FAULTY ¢CONTROL ¢CARDS )D 23 )LL ¢I¢
V. )T ¢COMMAND ¢OPERANDS AND ¢COMMAND ¢WORDS )D 24 )LT ¬¬¢SUMMARY OF ¢COMMAND ¢O
PERANDS )D 28 )LT ¬¬¢EXAMPLES OF ¢COMMAND ¢WORDS )D 29 )LL ¢V. )T ¢SPECIAL ¢OPER
ANDS FOR ¢CAPITALIZATION AND ¢SPECIAL )LT ¢CHARACTERS, AND THE ¢NON-¢TRIVIAL ¢BL
ANK )D 31 )LT ¬¬¢EXAMPLES OF THE ¢USAGE OF ¢SPECIAL ¢OPERANDS )D 34 )LL ¢V¢I. )T
 ¢THE ¢EDITOR ¢FACILITY )D 35 )LT ¬¬¢EXAMPLES OF ¢EDITOR ¢CONTROL ¢CARD ¢GROUPS
)D 43 )LL ¢V¢I¢I. )T ¢RULES FOR ¢USING )¢ FORMAT )¢D 44 )LL¢ VIII. )¢T ¢SUMMARY
OF )¢ FORMAT )¢ ¢CONTROL ¢CARDS AND ¢COMMAND ¢OPERANDS )D 46 )LL¢ IX. )¢T ¢DATAS
ETS ¢USED BY )¢ FORMAT )¢D 50 )LL¢ X. )¢T ¢DESCRIPTION OF )¢ FORMAT )¢ FOR ¢O¢S/
360, )LT ¬¬AND ¢SUGGESTED ¢CONTROL ¢CARDS )D 53 )LL¢ XI. )¢T ¢HINTS AND ¢SUGGEST
IONS )D 55 )LL¢ XII. )T¢ ¢ERROR ¢HANDLING AND ¢DIAGNOSTIC ¢MESSAGES )D 57 )LL¢ X
III. )¢T ¢APPENDIX )D 61 )LLT ¢INDEX )LLT ¢CONTROL ¢CARDS )LLT ¢DIAGNOSTICS )SV
BACKSPACE CHARACTER IS NUMBER 46 (@)
CYCLE PAGE NUMBERS
RIGHT SIDE PAGE NUMBER TO START
PAGE NO. = 1
GO
¢I. )U ¢SUMMARY OF ¢FACILITIES )ULLP )¢ FORMAT )¢ IS A PROGRAM FOR ¢SYSTEM/360 A
ND ¢SYSTEM/370 DESIGNED TO MEET THE NEED FOR A RAPID METHOD OF EDITING AND PRODU
CING PAPERS, REPORTS, AND OTHER FINISHED AND REPRODUCIBLE DOCUMENTS DIRECTLY ON
THE SYSTEM PRINTER, USING UPPER AND LOWER CASE AND SPECIAL CHARACTERS. IT HAS FA
CILITIES WHICH SIMPLIFY THE TASK OF INDEX CONSTRUCTION. INPUT TO THE PROGRAM IS
FREE-FORM CARD-IMAGE TEXT. THE DOCUMENT IS FORMATTED AND CONTROLLED ACCORDING TO
 CONTROL CARDS AND ¢COMMAND ¢WORDS INTERSPERSED THROUGHOUT THE INPUT. )¢ FORMAT
)¢ IS A SINGLE PROGRAM REQUIRING NO AUXILIARY PROGRAMS FOR ITS OPERATION. )P VIA
 ENTIRELY FREE-FORM CONTROL CARDS THE USER MAY SPECIFY: )LL ----¬¬¬¢AUTOMATIC CA
PITALIZATION OF ALL SENTENCES )L ----¬¬¬ ¢NUMBER OF TEXT COLUMNS PER PAGE )L ----
¬¬¬¢WIDTH OF TEXT COLUMNS )L ----¬¬¬ ¢NUMBER OF LINES PER PAGE )L ----¬¬¬ ¢NUMBER
OF PRINT POSITIONS BETWEEN TEXT COLUMNS )L --- )HT ¢PAGE NUMBERING AND FIRST PAG
E NUMBER (OR NO NUMBERING) )HLH ----¬¬¬¬¢LOCATION OF PAGE NUMBER ON THE RIGHT, TH
E LEFT, OR ALTERNATING )HL ----¬¬¬ )H ¢NUMBER OF PRINT POSITIONS FOR PARAGRAPH IN
DENTATION )HL ----¬¬¬ )H ¢NUMBER OF PRINT POSITIONS FOR COLUMN INDENTATION )HL --
---¬¬¬ ¢LINE SPACING (SINGLE SPACING, DOUBLE SPACING, ETC.) )L ----¬¬¬ ¢NUMBER OF L
INES BETWEEN PARAGRAPHS )L ----¬¬¬ ¢RIGHT-JUSTIFICATION OF TEXT (OR NOT) )L ----¬¬
```

¬ ¢TAB SETTINGS)L ------¬ ¢EXTENT OF CARD FIELD FROM WHICH INPUT IS TO BE READ) L ----¬¬¬ ¢PRINTING OF TITLE ON EVERY PAGE (OR NOT))L ----¬¬¬¬¢POSITION OF THE TI TLE)L ----¬¬¬¬¢POSITION OF THE TEXT)L ----¬¬¬¬¢POSITION OF THE FOOTER)LH ----¬¬ ¬¢SENTENCES SEPARATED BY A MINIMUM OF 1 OR 2 BLANKS)HL ----¬¬¬ ¢KIND OF KEYPUNCH USED)L ----¬¬¬)H ¢UPPER AND LOWER CASE OUTPUT (OR ALL UPPER CASE))HL ----¬¬¬¬¢ NUMBER OF COPIES OF DOCUMENT)L ----¬¬¬¬¢CREATION OF CONDENSED INPUT TAPE FROM CA RD DECK)L ----¬¬¬¬¢EDITING OF INPUT MASTER TAPE)L ----¬¬¬¬¢LISTING AND/OR PUNCHI NG OF INPUT DATASET)L ----¬¬¬¬¢TAPE INPUT)L ----¬¬¬¬¢TAPE OUTPUT)L ----¬¬¬¬¢PRIN TING OF OUTPUT MASTER TAPE)L ----¬¬¬¬¢MERGING AND/OR JOINING OF INPUT TAPES)LH ----¬¬¬¬¢*PRODUCTION OF AN ALPHABETIZED LIST OF ALL SIGNIFICANT WORDS IN THE DOCUM* ENT, WITH A COUNT OF EACH)HLH ----¬¬¬¬¢THAT CERTAIN WORDS, PHRASES, OR STRINGS B E LOCATED)HLH ----¬¬¬¬¢THAT SPECIFIC CHARACTERS ARE TO BE LEFT IN THE SPACES SKI PPED OVER WHEN TABULATING TO NEW COLUMN POSITIONS)HLH ----¬¬¬¬¢THAT A PARTICULAR SPECIAL CHARACTER SHOULD BE RECOGNIZED AS REQUESTING OVERPRINTING)HLH ----¬¬¬¬¢ THAT A PAGE SHOULD BE MADE DARKER BY PRINTING EACH LINE MORE THAN ONCE, ON TOP O F ITSELF)HLH ----¬¬¬¬¢THAT A PARTICULAR SPECIAL CHARACTER SHOULD BE RECOGNIZED A S A NON-ELIMINATABLE BLANK)HLH ----¬¬¬¬¢THAT UNDERLINING SHOULD OR SHOULD NOT BE GIN AND END UNDER PUNCTUATION CHARACTERS)HLH ----¬¬¬¬¢THAT NON-ELIMINATABLE BLAN KS SHOULD OR SHOULD NOT BE CONSIDERED WHEN CENTERING AND UNDERLINING TEXT)H)LP)¢ FORMAT)¢ DOES NOT PROVIDE FACILITIES FOR AUTOMATIC HYPHENATION, FOR AUTOMAT IC PRODUCTION OF A TABLE OF CONTENTS, OR FOR FOOTNOTES; PAGE NUMBERS APPEAR ONLY AT THE TOP OF THE PAGE.)P COMMANDS EMBEDDED WITHIN THE TEXT (CALLED ¢COMMAND ¢ WORDS) PROVIDE THE CAPABILITY TO START A NEW LINE, PARAGRAPH, COLUMN, AND PAGE; *TO TABULATE LEAVING BLANKS, DOTS, OR ANY OTHER CHARACTER IN THE SPACES SKIPPED O* VER; TO UNDERLINE (AND TO STOP); TO READ GROUPS OF CONTROL CARDS; TO CENTER TEXT WITHIN A COLUMN-LINE (AND TO STOP); TO PRINT TEXT "AS IS" (AND TO STOP); TO PRI *NT TEXT IN UPPER CASE (AND TO STOP); TO PRINT TEXT WITH EACH WORD CAPITALIZED (A* ND TO STOP); TO INDENT (IMMEDIATE OR DELAYED) EITHER OR BOTH COLUMN MARGINS (AND TO RESTORE THE COLUMN FORMAT); TO KEEP THE NEXT N LINES IN THE SAME TEXT COLUMN ; AND TO KEEP TEXT OF UNSPECIFIED LENGTH IN THE SAME TEXT COLUMN.)P¢ FORMAT)¢ REQUIRES A MINIMUM MEMORY SIZE OF 64¢K IN A STANDARD ¢SYSTEM/360. NO ADDITIONAL DEVICES ARE REQUIRED BEYOND THOSE NECESSARY TO OPERATE ¢O¢S/360; HOWEVER, THE AV AILABILITY TO THE PROGRAM OF MAGNETIC TAPE DRIVES GREATLY ENHANCES ITS USEFULNES S, ESPECIALLY IF THE ¢EDITOR FACILITY IS TO BE USED WITH ANY REGULARITY.)¢ FORM AT)¢ IS WRITTEN ENTIRELY IN FULL ¢FORTRAN ¢I¢V AND REQUIRES THE FULL ¢FORTRAN L IBRARY. THE ¢SYSTEM ¢INPUT DATASET (FROM WHICH)¢ FORMAT)¢ READS ITS CARD INPUT), THE ¢SYSTEM ¢OUTPUT DATASET (ON WHICH)¢ FORMAT)¢ PRINTS THE DOCUMENT AND OT HER MATERIALS), AND THE ¢SYSTEM ¢PUNCH DATASET (WHICH IS USED FOR PUNCHING A CON DENSED FORM OF THE INPUT DECK), ARE DEFINED AS ¢FORTRAN DATASET REFERENCE NUMBER S 5, 6, AND 7, RESPECTIVELY.)P THE NORMAL OUTPUT MODE IS UPPER AND LOWER CASE. MEANS ARE PROVIDED TO ALLOW THE USER TO SPECIFY UPPER CASE ONLY, AND SPECIAL CHA RACTERS.)¢ FORMAT)¢ PRODUCES ITS NORMAL OUTPUT FOR THE ¢T¢N PRINT TRAIN, AND H AS FACILITIES FOR PRINTING ALL OF THE 120 POSSIBLE CHARACTERS. NOTE THAT NO SUBS *CRIPTS ARE PROVIDED BY THE ¢T¢N PRINT TRAIN, NOR, THEREFORE, BY)¢ FORMAT.*)¢S) ¢ II.)¢U ¢INTRODUCTION)ULLP BEFORE DISCUSSING HOW)¢ FORMAT)¢ PRODUCES A DOCU MENT, WE WILL DEFINE AND ILLUSTRATE SOME TERMS AND NOTATION. THE FIGURE BELOW RE PRESENTS A TYPICAL PAGE OF TEXT; WE WILL REFER TO IT THROUGHOUT THIS INTRODUCTIO N.)LLM !24!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27 !27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!2 7!27!27!25)L |12¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¢TITLE¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬ ¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬ ¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬ ¬¬|)L |¬¬¬¬¬¬¢THIS IS THE BEGINNING OF A PARAGRAPH; THE ¬SIZE|)L |OF¬ THE¬ INDE NT AT THE START OF THE PARAGRAPH MAY BE|)L |SPECIFIED ON A CONTROL CARD.¬¬¬¬¬¬¬¬ ¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¢NOW,¬¬¬|)L |THIS MATERIAL BEGINS A NEW COLUMN-LINE: THAT IS, ¬IT|)L |STARTS ¬A NEW LINE W ITHIN THE CURRENT COLUMN OF TEXT|)L |MATERIAL.¬¬¬ ¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬|)L |¬¬¬¬¬¬¬ ¬¬¬|)L |¢THIS TEXT MATERIAL ILLUSTRA TES THE USE ¬OF¬¬¬¬¬¬¬¬¬¬¬|)L |AN ¬INDENT: ¬THE ¬RIGHT ¬MARGIN ¬HAS ¬BEEN¬¬¬¬¬¬¬¬

¬¬¬|)L |INDENTED AN ADDITIONAL 10 SPACES.¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬|)L |¬¬
¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¢THIS TEXT MATERIAL ILLUSTRATES THE USE OF A¬HANGING,|)L
|¬¬¬¬¬¬¬¬OR¬ DELAYED,¬ INDENT: THE TEXT IS NOT¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬INDENTED UNTI
L THE LINE FOLLOWING THE¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬FIRST LINE OF TEXT.¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬|)L |¬¬¬¬¬¬¬
¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¢THIS T
EXT¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬MATERIAL¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬IS¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬¬¬¬¬¬¬¬CENTERED!¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L |¬¬|)L
|¬¬|)L |¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬
¬¢FOOTER¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬|)L !22!27!27!27!27!27!27!27!27!27!27!27!27!27!
27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27
!27!27!27!27!27!27!27!27!27!27!27!27!23)LLLMW2 ¢IN THE ABOVE EXAMPLE PAGE, THE
PAGE NUMBER IS AT THE UPPER LEFT CORNER; THE TITLE (WHICH MAY OCCUPY MORE THAN O
NE LINE) IS AT THE TOP OF THE PAGE; THE FOOTER (OR FOOTING TITLE, OR RUNNING FOO
T) IS AT THE BOTTOM OF THE PAGE; THE TEXT MATERIAL CONSISTS OF A SINGLE COLUMN 5
2 PRINT POSITIONS WIDE; THE HANGING TEXT WAS INDENTED 7 SPACES ON THE LEFT AND 8
SPACES ON THE RIGHT; THE TITLE IS SEPARATED FROM THE TEXT BY 3 BLANK LINES; THE
FOOTER IS SEPARATED FROM THE LAST TEXT LINE BY 3 BLANK LINES; AND THE INDENT AT
THE START OF A PARAGRAPH IS 5 SPACES.)P)¢ FORMAT)¢ PRODUCES A DOCUMENT BY RE
ADING CONTROL CARDS AND TEXT. THE TEXT IS ARRANGED ON THE OUTPUT PAGE IN A FORMA
T DETERMINED BY THE CONTROL CARDS.)¢ FORMAT)¢ READS ITS INPUT IN ONE OF TWO PH
ASES: AN)U EDIT PHASE)U AND A)U DOCUMENT PHASE.)U (¢THERE MAY BE EITHER (1)
ONLY A DOCUMENT PHASE, OR (2) AN EDIT PHASE FOLLOWED BY A DOCUMENT PHASE. WE WIL
L DISCUSS THE EDIT PHASE IN ¢SECTION ¢V¢I.) IN EACH OF THESE PHASES,)¢ FORMAT)
¢ READS ITS INPUT IN DIFFERENT)U MODES.)U IN THE DOCUMENT PHASE,)¢ FORMAT)¢
READS ITS INPUT CARDS IN ONE OF THREE MODES: CONTROL CARD MODE, NORMAL TEXT MODE
, AND "AS-IS" TEXT MODE. (¢AS-IS TEXT MODE WILL BE DISCUSSED IN ¢SECTION ¢I¢V.)
)P TO START THE DOCUMENT PHASE,)¢ FORMAT)¢ BEGINS BY READING ITS INPUT IN CONT
ROL CARD MODE. BECAUSE MOST OF THE PAGE LAYOUT CONTROL VARIABLES HAVE BEEN PRESE
T TO "AVERAGE" VALUES (SUCH AS 59 LINES PER PAGE, 64 CHARACTERS PER LINE IN A SI
NGLE COLUMN, ETC.), THE ONLY CONTROL CARD NEEDED INITIALLY IS THE ONE THAT SIGNA
LS THE END OF A GROUP OF CONTROL CARDS, AND CAUSES)¢ FORMAT)¢ TO SWITCH TO NOR
MAL TEXT MODE: THE "¢G¢O" CONTROL CARD.)P IN TEXT MODE,)¢ FORMAT)¢ READS THE
INPUT TEXT AND ARRANGES IT IN THE DESIRED LAYOUT ON AN INTERNAL "IMAGE" OF THE P
AGE TO BE PRINTED. AS EACH PAGE IMAGE IS FILLED, IT IS SENT TO THE PRINTER. IF A
NY ERRORS ARE DETECTED,)¢ FORMAT)¢ MAKES A NOTE OF EACH, AND WILL PRINT A LIST
OF DIAGNOSTIC MESSAGES DESCRIBING THE ERROR AT THE END OF THE JOB. FOR MOST ERR
ORS,)¢ FORMAT)¢ WILL ASSIGN DEFAULT VALUES TO THE ERRONEOUS VARIABLES, OR TAKE
DEFAULT ACTIONS FOR ERRONEOUS COMMANDS.)P WHILE IN NORMAL TEXT MODE, THE USER
WILL NORMALLY WISH TO SPECIFY ACTIONS SUCH AS "BEGIN A NEW PARAGRAPH", "SKIP TO
A NEW LINE", "INDENT THE MARGINS", AND SO FORTH. THESE ACTIONS ARE REQUESTED WIT
H)FU COMMAND WORDS,)FU WHICH MAY APPEAR ANYWHERE IN THE INPUT TEXT. THEY ARE N
OT PRINTED BY)¢ FORMAT,)¢ BUT CAUSE IT TO TAKE THE SPECIFIED ACTIONS INSTEAD (
UNLESS THEY ARE INCORRECTLY GIVEN AND THEREFORE CAUSE AN ERROR).)P¢ FORMAT)¢ D
ETECTS THE START OF A ¢COMMAND ¢WORD BY FINDING AN ESCAPE CHARACTER: A RIGHT PAR
ENTHESIS WHICH IS PRECEDED BY ONE OR MORE BLANKS (SPACES), AND FOLLOWED BY ONE O
R MORE NON-BLANK CHARACTERS. THE CHARACTERS WHICH FOLLOW THE RIGHT PARENTHESIS A
RE CALLED)FU COMMAND OPERANDS,)FU AND THEY SPECIFY WHAT ACTIONS)¢ FORMAT)¢ S
HOULD TAKE. A ¢COMMAND ¢WORD IS ENDED BY ONE OR MORE BLANKS. (¢EVEN THOUGH IT IS
VERY UNLIKELY THAT THE INPUT TEXT WILL CONTAIN A STRING OF CHARACTERS STARTING
WITH A RIGHT PARENTHESIS,)¢ FORMAT)¢ PROVIDES THE)FU SPECIAL OPERANDS)UF (DE
SCRIBED IN ¢SECTION ¢V) WHICH ALLOW US TO PRINT SUCH A STRING IF IT IS DESIRED.
THUS THE CHOICE OF THE RIGHT PARENTHESIS AS THE "ESCAPE CHARACTER" IS NOT A LIMI
TATION ON THE USER.))P TO ILLUSTRATE, THE ¢COMMAND ¢OPERAND WHICH REQUESTS THE
START OF A NEW PARAGRAPH IS THE LETTER "¢P". THUS, IF THE INPUT TEXT CONTAINED T
HE ¢COMMAND ¢WORD "¬!40¢P¬", THE FOLLOWING TEXT MATERIAL WOULD BEGIN A NEW PARAG
RAPH. ANOTHER COMMONLY USED ¢COMMAND ¢OPERAND IS "¢L", WHICH HAS AN EFFECT SIMIL

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AR TO THE ACTION CAUSED BY STRIKING THE "RETURN" KEY ON A TYPEWRITER: THE END OF
 THE CURRENT LINE IS SIGNALED, AND THE CARRIAGE IS POSITIONED AT THE START OF TH
E FOLLOWING LINE. THUS, THE ¢COMMAND ¢WORD "¬!40¢L¢L¬" WOULD CAUSE THE LINE OF T
EXT IN WHICH IT APPEARS TO TERMINATE, AND THE FOLLOWING LINE TO BE SKIPPED. THIS
 EXAMPLE OF A COMMAND WORD CONTAINS )U TWO )U ¢COMMAND ¢OPERANDS, "¢L" AND "¢L";
 THIS SHOWS HOW ¢COMMAND ¢OPERANDS ARE GROUPED TO FORM ¢COMMAND ¢WORDS. )P WE WI
LL NOW LOOK AT A SIMPLE EXAMPLE OF )¢ FORMAT )¢ INPUT: SUPPOSE WE WISH TO PRINT
THE FIRST PART OF THE TEXT MATERIAL SHOWN IN THE FIGURE. THE INPUT TEXT COULD BE
 PREPARED AS FOLLOWS: )LLW2¢A
  !40¢P THIS IS       THE BEGINNING OF A PARAGRAPH; THE
                SIZE OF THE INDENT AT THE START     OF THE
  PARAGRAPH MAY BE SPECIFIED ON A CONTROL CARD. !40¢L NOW,    !40¢L
  THIS
  MATERIAL BEGINS A NEW COLUMN-LINE: THAT IS, IT     STARTS
  A NEW LINE WITHIN THE CURRENT COLUMN OF TEXT MATERIAL. !40¢L¢L¢L
)
)¢LP SEVERAL IMPORTANT POINTS ARE ILLUSTRATED IN THIS EXAMPLE. FIRST, THE INPUT
TO )¢ FORMAT )¢ IS ENTIRELY FREE-FORM: THE USER MAY LEAVE AS MANY SPACES BETWEEN
 INPUT WORDS AS HE LIKES, AND )¢ FORMAT )¢ WILL IGNORE THE EXCESS BLANKS AS IT C
OLLECTS WORDS TO BE PLACED IN THE PAGE IMAGE. SECOND, THERE IS NO NEED TO START
A NEW )U INPUT )U LINE WHEN A NEW )U OUTPUT )U LINE IS DESIRED; THE "¢L" ¢COMMAN
D ¢OPERAND WILL START A NEW LINE ON THE OUTPUT PAGE. )¢LL )P AS THE INPUT CARDS
ARE READ BY )¢ FORMAT, )¢ IT MAY BE NECESSARY TO CHANGE SOME OF THE CONTROL VARI
ABLES WHICH DETERMINE THE ARRANGEMENT OF THE TEXT ON THE PAGE. FOR EXAMPLE, THE
USER MAY WANT TO CHANGE FROM ONE COLUMN PER PAGE TO TWO (AS WAS DONE TO PRODUCE
THE INDEX FOR THIS MANUAL). TO GO FROM NORMAL TEXT MODE BACK TO CONTROL CARD MOD
E, A ¢COMMAND ¢WORD IS PLACED IN THE INPUT STREAM WHICH ENDS WITH THE ¢COMMAND ¢
OPERAND "¢V". THE REST OF THE CARD FOLLOWING THE "¢V" IS IGNORED, AND )¢ FORMAT
)¢ BEGINS READING CONTROL CARDS WITH THE NEXT INPUT CARD. THUS, THE USER CAN DYN
AMICALLY MODIFY THE LAYOUT OF THE TEXT ON THE PAGE, AND CAN CHANGE THE VALUES OF
 THE CONTROL VARIABLES. AS BEFORE, THE END OF THE CONTROL CARD GROUP IS SIGNALED
 BY A "¢G¢O" CONTROL CARD. )P TO ILLUSTRATE, SUPPOSE WE WISH TO SET THE MARGIN I
NDENTS TO BE ZERO SPACES AT THE LEFT AND TEN SPACES AT THE RIGHT, AS IN THE SECO
ND PORTION OF THE FIGURE ABOVE. THE NECESSARY INPUT COULD BE PREPARED AS FOLLOWS
: )LL¢W2A
       !40¢V
  INDENTATION OF THE COLUMN IS (0,10) POSITIONS
  GO
  !40¢I !43THIS TEXT MATERIAL ILLUSTRATES
  THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
  ADDITIONAL 10 SPACES.    !40¢I¢L¢L¢L
)
)¢LP IN THIS EXAMPLE, THE "¢I" ¢COMMAND ¢OPERAND WAS USED TO CONTROL INDENTATION
 OF THE MARGINS. ITS OPERATION IS LIKE THAT OF AN "ON-OFF" SWITCH: EACH APPEARAN
CE OF THE "¢I" ¢COMMAND ¢OPERAND CAUSES INDENTATION TO BEGIN (IF IT WAS NOT ALRE
ADY IN EFFECT) OR TO END (IF IT WAS IN EFFECT). IT IS NOT LIKE THE "¢L" ¢COMMAND
 ¢OPERAND, WHICH CAUSES A NEW LINE EACH TIME IT APPEARS; "¢I" DOES NOT CAUSE ADD
ITIONAL INDENTATION EACH TIME IT APPEARS, BUT TURNS THE INDENTATION ON OR OFF. T
HE "¢" SIGN PRECEDING THE WORD )¢ "THIS" )¢ IS CALLED A )FU SPECIAL OPERAND. )FU
 ¢IT CAUSES THE IMMEDIATELY FOLLOWING LETTER (THE "¢T") TO BE CAPITALIZED IN THE
 PRINTED OUTPUT. ¢SPECIAL ¢OPERANDS WILL BE DISCUSSED IN ¢SECTION ¢V. )P WE OBSE
RVE THAT THE NEXT SEGMENT OF TEXT MATERIAL IN THE FIGURE ALSO REQUIRES AN INDENT
ATION. THE CONTROL CARD WHICH ALLOWS US TO SET THE AMOUNT OF INDENTATION (THE )¢
 "INDENTATION OF THE COLUMN" )¢ CONTROL CARD) CAN SPECIFY UP TO SEVEN DIFFERENT
INDENTATIONS. THUS, RATHER THAN PREPARE ANOTHER CONTROL CARD, WE WILL GO BACK AN
D CHANGE THE PREVIOUS INPUT MATERIAL SO THAT IT WILL CONTROL BOTH OF THE INDENTE
D SEGMENTS OF TEXT IN THE FIGURE. THE USE OF THE "¢H" ¢COMMAND ¢OPERAND WILL BE
EXPLAINED SHORTLY. )LL¢W2A
       !40¢V
  INDENTATION OF THE COLUMN IS (0,10),(7,8) POSITIONS
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  GO
  !40¢I !43THIS TEXT MATERIAL ILLUSTRATES
  THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
  ADDITIONAL 10 SPACES.    !40¢I¢L¢L¢L¢H2 THIS TEXT MATERIAL
  ILLUSTRATES THE USE OF A HANGING, OR DELAYED, INDENT: THE
  TEXT IS NOT INDENTED UNTIL THE LINE FOLLOWING THE FIRST
  LINE OF TEXT. !40¢H2¢L¢L¢L
)
)¢LP AS NOTED ABOVE FOR "¢I", THE "¢H" ¢COMMAND ¢OPERAND WORKS LIKE AN ON-OFF SW
ITCH. AN ADDITIONAL FEATURE ILLUSTRATED IN THE ABOVE EXAMPLE IS THE "2" FOLLOWIN
G THE "¢H" ¢COMMAND ¢OPERAND, WHICH MEANS THAT THE )U SECOND )U PAIR OF COLUMN I
NDENTATIONS IS TO BE USED IN DETERMINING THE NUMBER OF POSITIONS TO INDENT. SEVE
RAL OTHER ¢COMMAND ¢OPERANDS MAY BE FOLLOWED BY A NUMBER; THEY ARE DISCUSSED IN
¢SECTION ¢I¢V. )P THE LAST TEXT SEGMENT IN THE FIGURE COULD BE PREPARED AS FOLLO
WS: )¢LLW2A
  !40¢M THIS TEXT !40¢L MATERIAL !40¢L IS !40¢L    CENTERED! !40¢M
)
)¢LP THE "¢M" ¢COMMAND ¢OPERAND CAUSES CENTERING OF THE PRINTED TEXT TO BEGIN OR
 END. IT IS LIKE THE "¢I" AND "¢H" ¢COMMAND ¢OPERANDS IN BEING LIKE AN ON-OFF SW
ITCH, BUT "¢M" DOES NOT DEPEND ON A CONTROL CARD TO DETERMINE THE AMOUNTS OF SPA
CING TO BE PERFORMED. )P¢ FORMAT )¢ DETERMINES THAT THE END OF THE INPUT HAS BEE
N REACHED WHEN IT DETECTS A ¢COMMAND ¢WORD ENDING WITH THE ¢COMMAND ¢OPERAND "¢E
". (¢THIS MEANS, OF COURSE, THAT THE END OF THE INPUT SHOULD OCCUR IN NORMAL TEX
T MODE, NOT IN "AS-IS" TEXT MODE OR IN CONTROL CARD MODE.) )¢ FORMAT )¢ THEN PRI
NTS THE FINAL TEXT PAGE, FOLLOWED BY A LIST OF ALL CONTROL CARDS READ, AND THE D
IAGNOSTICS (IF ANY). AT THIS POINT, )¢ FORMAT )¢ WILL RE-INITIALIZE ITSELF TO RE
AD A FRESH JOB, STARTING TO READ IN CONTROL CARD MODE JUST AS IT DID AT THE VERY
 BEGINNING. THUS, MULTIPLE DOCUMENTS MAY BE PRODUCED IN A SINGLE COMPUTER RUN. )
P TO ILLUSTRATE A COMPLETE )¢ FORMAT )¢ JOB, WE WILL NOW GIVE A COMPLETE SET OF
INPUT "CARD IMAGES" THAT COULD BE USED TO PRODUCE THE FIGURE AT THE START OF THI
S SECTION. THE READER IS NOT EXPECTED TO UNDERSTAND ALL OF THE )¢ FORMAT )¢ TECH
NIQUES USED, ALTHOUGH MOST OF THEM WILL BE FAMILIAR. )LLW3¢A
  CAPITALIZE AUTOMATICALLY
  WIDTH OF COLUMN IS 52 PRINT POSITIONS
  LINES PER PAGE ARE 32
  TEXT STARTS ON LINE 5, IN PRINT POSITION 1
  COLUMNS PER PAGE = 1
  LEFT TOP POSITION FOR PAGE NUMBER
  PAGE NUMBER STARTING AT 12
  TITLE STARTS ON LINE 1, IN PRINT POSITION 24
  !40F TITLE !40FE
  FOOTER STARTS ON LINE 32, IN PRINT POSITION 23
  !40F FOOTER !40FE
  GO
  !40¢P THIS IS       THE BEGINNING OF A PARAGRAPH; THE
              SIZE OF THE INDENT AT THE START     OF THE
  PARAGRAPH MAY BE SPECIFIED ON A CONTROL CARD. !40¢L NOW,    !40¢L
  THIS
  MATERIAL BEGINS A NEW COLUMN-LINE: THAT IS, IT     STARTS
  A NEW LINE WITHIN THE CURRENT COLUMN OF TEXT MATERIAL. !40¢L¢L¢L¢V
  INDENTATION OF THE COLUMN IS (0,10),(7,8) POSITIONS
  GO
  !40¢I !43THIS TEXT MATERIAL ILLUSTRATES
  THE USE OF AN INDENT: THE RIGHT MARGIN HAS BEEN INDENTED AN
  ADDITIONAL 10 SPACES.    !40¢I¢L¢L¢L¢H2 THIS TEXT MATERIAL
  ILLUSTRATES THE USE OF A HANGING, OR DELAYED, INDENT: THE
  TEXT IS NOT INDENTED UNTIL THE LINE FOLLOWING THE FIRST
  LINE OF TEXT. !40¢H2¢L¢L¢L
  !40¢M THIS TEXT !40¢L MATERIAL !40¢L IS !40¢L    CENTERED! !40¢M¢E
)
```

)¢LL)P THIS EXAMPLE SHOWS THE THREE LEVELS OF CONTROL PROVIDED BY)¢ FORMAT.)¢ CONTROL CARDS PROVIDE GLOBAL CONTROLS; ¢COMMAND ¢WORDS PROVIDE CONTROLS AT THE WORD LEVEL; AND ¢SPECIAL ¢OPERANDS PROVIDE CONTROLS AT THE CHARACTER LEVEL.)P)¢ FORMAT)¢ PROVIDES A NUMBER OF OTHER POWERFUL CAPABILITIES SUCH AS THE)¢ DICTIONARY, $LOCATE,)¢ AND)¢ EDITOR)¢ FACILITIES. THE BEGINNER SHOULD EXPERIMENT WITH SIMPLE TEXT INPUT UNTIL SOME FAMILIARITY WITH)¢ FORMAT)¢ HAS BEEN ATTAINED. AS A START, STUDY THE INPUT WHICH PRODUCED THE EXAMPLES ABOVE. THEN PUNCH THE ABOVE)¢ FORMAT)¢ JOB ON CARDS, ADD THE NECESSARY ¢JOB ¢CONTROL CARDS (SEE ¢SECTION ¢X; AN EXPERIENCED PROGRAMMER CAN HELP PREPARE THEM), AND RUN THE JOB ON THE COMPUTER. THEN GENERATE SOME SIMPLE INPUT TEXT, AND EXPERIMENT WITH OTHER)¢ FORMAT)¢ FEATURES.)P A SUGGESTED SEQUENCE FOR READING THIS MANUAL IS TO SKIM ¢ SECTIONS ¢I¢I¢I THROUGH ¢V, AND THE HINTS AND SUGGESTIONS GIVEN IN ¢SECTION ¢X¢I. THEN, AFTER STUDYING THE ABOVE INPUT AND RUNNING A FEW SIMPLE PROBLEMS, GO BACK AND STUDY THOSE SECTIONS MORE CAREFULLY. AS MORE EXPERIENCE IS GAINED, THE OTHER PARTS OF THE MANUAL MAY BE CONSULTED AS NEEDED.)S)¢ III.)¢J ¢CONTROL ¢CARDS)ULLP ¢EVERY)¢ FORMAT)¢ JOB MUST BEGIN WITH A CONTROL CARD GROUP, WHICH IS DEFINED AS A GROUP OF CONTROL CARDS ENDING WITH THE)¢ "GO")¢ CONTROL CARD (ALL OTHER CONTROL CARDS ARE OPTIONAL). THE POSITION OF A CONTROL CARD WITHIN A CONTROL CARD GROUP IS NOT SIGNIFICANT, UNLESS SPECIFIED IN ITS DESCRIPTION. A CONTROL CARD GROUP MAY APPEAR AT ANY POINT IN THE INPUT TEXT STREAM (SEE THE "¢V" ¢COMMAND ¢OPERAND IN ¢SECTION ¢I¢V). DEFAULT VALUES FOR EACH OPTION ARE ASSUMED IF NO CONTROL CARD PERTAINING TO THAT PARTICULAR OPTION HAS BEEN SUPPLIED IN ANY CONTROL CARD GROUP IN THE JOB. THE DEFAULT VALUES ARE SUMMARIZED IN ¢SECTION ¢V¢I¢I¢I. THE VALUES OF MOST OF THE OPTIONS CAN BE VARIED AS NEEDED DURING THE READING OF THE INPUT AND THE FORMATTING OF THE DOCUMENT. HOWEVER, SOME OF THE OPTIONS CANNOT BE RESET ONCE THEY HAVE BEEN SET, AS NOTED IN THEIR DESCRIPTIONS.)P THE FORMAT OF EACH CONTROL CARD IS ENTIRELY FREE-FORM, AS LONG AS THE FIRST 3 NON-BLANK CHARACTERS OF EACH CONTROL CARD ARE AS SPECIFIED BY THE SUGGESTED CONTROL CARD NAME, AND THE CONTROL CARD IS ON ONE CARD IMAGE.)¢ (FORMAT)¢ SCANS CONTROL CARDS BY SAVING THE FIRST THREE NON-BLANK CHARACTERS, AND THEN SEARCHING FOR THE NUMBERS THAT GIVE THE VALUES OF THE PARAMETERS.) AT THE CONCLUSION OF EACH JOB, THE CONTROL CARDS USED FOR THAT JOB ARE LISTED BY GROUP ON THE ¢SYSTEM ¢OUTPUT DATASET.)P WE WILL NOW GIVE THE SPECIFICATIONS FOR EACH OF THE CONTROL CARDS IN TURN. IN SOME OF THE DESCRIPTIONS, IT IS STATED THAT SOME OPTION MAY OR MAY NOT BE USED IN A TITLE; IN ALL SUCH CASES, THE STATEMENT APPLIES TO FOOTERS ALSO. EXAMPLES OF CORRECT AND FAULTY CONTROL CARDS WILL BE GIVEN AT THE END OF THIS SECTION. IN SOME OF THE CONTROL CARDS, NUMERIC OPERANDS MAY BE REQUIRED. THESE ARE REPRESENTED BY LOWER-CASE LETTERS SUCH AS)U X,)UU Y,)UU Z,)U OR)U NN;)U AN OPERAND SUCH AS)U X)U IS)U NOT)U LIMITED TO A SINGLE DIGIT.)LLLLLL¢W4 BACKSPACE CHARACTER IS SPECIAL CHARACTER NUMBER)¢U NN)U)P TO SIMULATE THE ACTION OF THE BACKSPACE KEY ON A TYPEWRITER, ONE OF THE SPECIAL CHARACTERS (DESCRIBED IN ¢SECTION ¢V) MAY BE DESIGNATED AS THE "BACKSPACE" CHARACTER, EXCEPT FOR SPECIAL CHARACTERS NUMBERED 43 (¢) AND 51 (!). THE ACTION OF THE BACKSPACE CHARACTER IS AS FOLLOWS: THE CHARACTER TO BE PRINTED OVER AND THE OVERPRINT CHARACTER ARE SEPARATED BY THE BACKSPACE CHARACTER, WITH A FEW MINOR EXCEPTIONS. IF THE BACKSPACE CHARACTER IS FOLLOWED BY A BLANK, THEN IT IS ASSUMED THAT NO OVERPRINT WAS DESIRED, AND THE BACKSPACE CHARACTER WILL PRINT NORMALLY. MULTIPLE BACKSPACES ARE IGNORED, AND HAVE NO MORE EFFECT THAN A SINGLE ONE; THEY ALL CAUSE ONLY A SINGLE BACKSPACE, AND THE ONLY CHARACTER WHICH WILL OVERPRINT THE CHARACTER PRECEDING THE FIRST BACKSPACE WILL BE THE CHARACTER FOLLOWING THE LAST BACKSPACE.)P THE NUMBER)U NN)U GIVEN ON THE CONTROL CARD MUST LIE BETWEEN 10 AND 50; IF IT DOES NOT, BACKSPACING WILL BE TURNED OFF AND NO CHARACTER WILL BE RECOGNIZED AS A BACKSPACE. NOTE THAT THE BACKSPACE CHARACTER, WHEN USED IN THE INPUT TEXT, MAY BE IN ITS ACTUAL (CHARACTER) FORM OR IN ITS SPECIAL (!NN) FORM. THE DEFAULT ACTION IS THAT NO BACKSPACES ARE RECOGNIZED.)P TO GIVE SOME EXAMPLES: SUPPOSE THE BACKSPACE CHARACTER IS NUMBER 50, THE QUESTION MARK (?). THEN THE INPUT CHARACTERS ¢O?- WOULD PRODUCE ¢O@-, /?O WOULD PRODUCE /@O, AND LETT?_ER WOULD PRODUCE LETT@_ER. NOTE THAT SPECIAL CHARACTERS MAY BE USED FOR OVERPRINTING, SO THAT =!5150!5133 WOULD PRODUCE =@!33. THE FIGURE BELOW MAKES USE OF BACKSPACING TO PRINT THE DIVIDERS AT THE INSIDE EDGES OF THE BOXES: THE CHARACTERS !27?!25 PRODUCE !27@!25, A

ND THE CHARACTERS !27?!23 PRODUCE !27@!23.)LLW7M !24!27!27!27!27!27!27!27!27!27
!27!27@!25!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!25)L
|¬¬¬BASE¬¬¬|¬¬¬¬DISPLACEMENT¬¬¬¬¬¬|)L !22!27!27!27!27!27!27!27!27!27!27!27@!23!2
7!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!23)LLM)P AT MOST
99 BACKSPACES ARE ALLOWED ON A SINGLE PAGE. ANY BACKSPACES FOLLOWING THE 99TH W
ILL BE IGNORED, AND THE BACKSPACE CHARACTER WILL PRINT NORMALLY. AN ERROR MESSAG
E WILL FLAG THE LOCATION OF THE 100TH BACKSPACE ON THE PAGE.)P BACKSPACES WILL
NOT WORK CORRECTLY INSIDE A "KEEP" (A REGION OF TEXT DELIMITED BY !40¢K'S; SEE ¢
SECTION ¢I¢V FOR A DESCRIPTION OF A "KEEP"). THE BACKSPACE CHARACTER ITSELF MAY
NOT BE USED FOR OVERPRINTING. BACKSPACING DOES NOT APPLY IN TITLES AND FOOTERS.
)LLL¢W4 BETWEEN COLUMNS LEAVE)¢U X)U¢ BLANKS)¢P ¢THE NUMBER OF PRINT POSITION
S SEPARATING TEXT COLUMNS IS X. THE DEFAULT NUMBER IS 2.)LLL¢W4 CAPITALIZE AUTO
MATICALLY)¢P ¢WHEN THIS CONTROL CARD IS IN EFFECT,)¢ FORMAT)¢ WILL AUTOMATICA
LLY CAPITALIZE THE FIRST WORD OF THE DOCUMENT, THE FIRST WORD FOLLOWING ¢COMMAND
¢OPERANDS "¢P" AND "¢S", AND EACH LETTER WHICH FOLLOWS .B !B ?B ."B !"B ?"B .)B
!)B AND ?)B (WHERE B = ONE OR MORE BLANKS) IN TEXT AND TITLES. THE DEFAULT ACTI
ON IS THAT THIS OPTION IS NOT USED. (¢SEE THE)¢ "NO CAPITALIZATION AUTOMATICALL
Y")¢ CONTROL CARD.))LLLW6)¢ CARD FIELD IS)¢U X)U¢ THRU)¢U Y)UL OR)L)¢ C
ARD FIELD EXTENDS THRU)¢U Y)UP ¢THIS CONTROL CARD (IN EITHER FORM) SPECIFIES T
HE COLUMNS OF THE INPUT DATA CARDS TO BE USED FOR READING NORMAL TEXT (IN TEXT M
ODE), AND TEXT FOR TITLES AND FOOTERS (WHICH IS READ IN CONTROL CARD MODE). THE
FIRST COLUMN OF THE CARD FIELD IS X, AND THE LAST COLUMN OF THE CARD FIELD IS Y.
IF THE SECOND FORM OF THE CONTROL CARD IS USED, THE CARD FIELD EXTENDS FROM COL
UMN 1 THROUGH COLUMN Y. THIS CONTROL CARD DOES)U NOT)U AFFECT CONTROL CARDS (W
HICH MAY BE LIMITED BY THE)¢ "CONTROL CARDS END IN")¢ CONTROL CARD; SEE BELOW)
, BUT ALL OTHER CARD INPUT TO)¢ FORMAT,)¢ INCLUDING TITLES, IS READ FROM THE F
IELD SPECIFIED. THE FIELD MUST BE AT LEAST 3 COLUMNS WIDE, AND AT MOST 80 COLUMN
S WIDE. THE DEFAULT CARD FIELD IS COLUMNS 1 THROUGH 80.)LLLW4¢ CENTER TEXT ON L
INE)¢U X)UP THE FIRST LINE OF THE TEXT IS PRINTER LINE X, AND THE DOCUMENT IS
CENTERED, IF POSSIBLE, WITHIN THE PRINT LINE OF 132 CHARACTERS. THE DEFAULT IS L
INE 5 AND CENTERING OF THE DOCUMENT ON THE PRINTER PAGE. (¢SEE THE)¢ "LINES PER
PAGE")¢ AND)¢ "TEXT STARTS ON")¢ CONTROL CARDS ALSO.))LLL¢W4 COLUMNS PER PA
GE =)¢U X)UP ¢THE NUMBER OF TEXT COLUMNS PER DOCUMENT PAGE IS X. THE MAXIMUM A
LLOWABLE NUMBER OF TEXT COLUMNS PER PAGE IS EIGHT. THE DEFAULT NUMBER IS 1.)LLL
¢W4 CONTROL CARDS END IN COLUMN)¢U X)U)P THIS CONTROL CARD ALLOWS THE USER TO
CONTROL THE POSITION OF THE RIGHT-HAND MARGIN OF A CONTROL CARD IN THE SAME WAY
AS CAN BE DONE FOR TEXT INPUT WITH THE)¢ "CARD FIELD")¢ CONTROL CARD. IF THE
VALUE OF)U X)U IS LESS THAN 7 OR GREATER THAN 80, IT WILL BE SET TO 80. THIS C
ONTROL CARD TAKES EFFECT STARTING WITH THE FOLLOWING CONTROL CARD. THE DEFAULT V
ALUE OF)U X)U IS 80. NOTE THAT EVEN THOUGH THE TEXT FOR TITLES AND FOOTERS IS
PART OF A CONTROL CARD GROUP, THE CARD FIELD FROM WHICH IT IS TAKEN IS SET BY TH
E)¢ "CARD FIELD")¢ CONTROL CARD.)LLL¢W4 COPIES =)¢U X)U)P X SPECIFIES THE
NUMBER OF COPIES OF THE DOCUMENT WHICH ARE TO BE PRODUCED DURING THE RUN. THE DE
FAULT VALUE IS 1. IF X IS 2 OR MORE, THE OUTPUT DATASET FROM THE PROGRAM IS WRIT
TEN ONTO DATASET REFERENCE NUMBER 8 (SEE ¢SECTION ¢I¢X). AT THE CONCLUSION OF TH
E LAST)¢ FORMAT)¢ JOB, DATASET REFERENCE NUMBER 8 IS COPIED ONTO THE ¢SYSTEM ¢
OUTPUT DATASET X TIMES, WHERE X IS THE OPERAND FIELD FROM THE LAST)¢ "COPIES =
)¢ X" CONTROL CARD READ. IF X IS ZERO IT IS TREATED AS ONE, UNLESS THE)¢ "OUTPU
T IS TAPE")¢ CONTROL CARD IS SPECIFIED.)LLL¢W4 CREATE A TAPE FROM CARD INPUT)
P ¢IF THE INPUT DATASET IS CURRENTLY THE ¢SYSTEM ¢INPUT DATASET (WHICH IS THE NO
RMAL SITUATION), THEN THE ENTIRE INPUT DATASET FOLLOWING THIS CONTROL CARD IS CO
PIED AND CONDENSED ONTO DATASET REFERENCE NUMBER 2. DATASET REFERENCE NUMBER 2 I
S THEN REWOUND AND BECOMES THE INPUT DATASET. PRINTED IN THE UPPER FAR RIGHT COR
NER OF EACH DOCUMENT PAGE PRODUCED ARE THE FIRST AND LAST CARD IMAGE NUMBERS (FR
OM THE CONDENSED DECK) THAT WERE USED IN PRODUCING THAT PAGE.)P ¢F¢O¢R¢M¢A¢T'S
CONDENSING FUNCTION SQUEEZES OUT UNNEEDED BLANKS, AND RESPONDS TO BUT PREVENTS T
HE FOLLOWING THREE CONTROL CARDS FROM BEING COPIED INTO THE CONDENSED DATASET:)
¢ "029 KEYPUNCH", "026 KEYPUNCH",)¢ AND)¢ "CARD FIELD IS... ".)¢ THE RESULT I
S A COMPACT CARD IMAGE DATASET (80 CHARACTERS PER RECORD, ALL OF WHICH ARE USED)
ON WHICH ALL RIGHT PARENTHESES (EXCEPT THOSE WITHIN "AS IS" REGIONS) ARE IN THE

029)¢ (EBCDIC))¢ MODE, REGARDLESS OF THEIR MODE IN THE ORIGINAL CARD INPUT DA TASET.)P AT THE CONCLUSION OF THE RUN THE INPUT DATASET ON DATASET REFERENCE NU MBER 2 (THE CONDENSED INPUT) IS LISTED, WITH CARD IMAGE NUMBERS AND NUMBERED TEX T AND TITLE WORDS, ONTO THE ¢SYSTEM ¢OUTPUT DATASET. IF THE LISTING IS PRINTED I N UPPER CASE ONLY (DUE EITHER TO ERRORS OR TO THE PRESENCE OF THE)¢ "SPECIAL PR INT TRAIN")¢ CONTROL CARD), THEN AN ASTERISK WILL REPLACE EACH CHARACTER FOR WH ICH NO GRAPHIC IS LIKELY TO BE ASSOCIATED. THE ¢COMMAND ¢OPERANDS CONTAINED IN E ACH CARD IMAGE ARE LISTED AGAIN ALONGSIDE EACH CARD IMAGE.)P THE PRIMARY USE OF THIS CONTROL CARD IS TO PRODUCE A CARD IMAGE INPUT DATASET THAT CAN BE SAVED FO R LATER EDITING; SEE ¢SECTION ¢V¢I FOR A DESCRIPTION OF THE ¢EDITOR FACILITY.)L LL¢W4 CYCLE THE PAGE NUMBER)¢P ¢IF PAGE NUMBERING HAS BEEN REQUESTED (BY THE)¢ LEFT TOP POSITION")¢ OR)¢ "RIGHT TOP POSITION")¢ CONTROL CARD), THEN THE PAG E NUMBER WILL BE ALTERNATED BETWEEN THE LEFT AND RIGHT TOP CORNERS ON SUCCESSIVE DOCUMENT PAGES. THE PAGE NUMBER APPEARS ON LINE 1 ALIGNED WITH THE APPROPRIATE BORDER OF THE TEXT. THE DEFAULT ACTION IS THAT THE FIRST PAGE NUMBER IS ALIGNED WITH THE RIGHT TEXT BORDER. (¢SEE THE)¢ "LEFT TOP POSITION", "RIGHT TOP POSITIO N",)¢ AND)¢ "PAGE NUMBER")¢ CONTROL CARDS.) ONCE CYCLING OF THE PAGE NUMBER H AS BEEN REQUESTED, IT STAYS IN EFFECT FOR THE REMAINDER OF THAT JOB.)LLL¢W4 DAR K PRINT EACH PAGE)¢U X)¢U TIMES)¢)P NORMALLY, EACH LINE ON THE OUTPUT PAGE W ILL BE PRINTED ONCE. IF X HAS A VALUE OF 2 OR 3, EACH LINE WILL BE PRINTED SUCCE SSIVELY ON TOP OF ITSELF UNTIL IT HAS BEEN PRINTED A TOTAL OF X TIMES. THIS ALLO WS DARKER PRINTING OF THE PAGE, AND IF THE PRINTER IS WELL-ADJUSTED AND THE PRIN TER RIBBON IS NEITHER TOO NEW NOR TOO OLD, THE TEXT IS PRINTED WITHOUT THE NORMA L BLUR AND GRAIN FROM THE RIBBON. IF X IS 0, IT IS SET TO 1, AND IF IT IS GREATE R THAN 3, IT IS SET TO 3. THE NUMBER OF TIMES EACH LINE IS PRINTED IS DETERMINED BY THE VALUE OF X IN EFFECT AT THE TIME THE ENTIRE PAGE IS PRINTED, SO IT IS)U NOT)U POSSIBLE TO PRINT PORTIONS OF A PAGE IN "BOLDFACE". THE DEFAULT IS SINGL E PRINTING.)LLL¢W4 DICTIONARY OF WORDS USED)P AN ALPHABETIZED LIST, 6 COLUMNS PER PAGE, OF ALL SIGNIFICANT WORDS IN THE INPUT STREAM, WITH A COUNT OF THE OCCU RRENCES OF EACH, IS WRITTEN ONTO THE ¢SYSTEM ¢OUTPUT DATASET AT THE CONCLUSION O F THE LAST)¢ FORMAT)¢ JOB. THIS DICTIONARY, IN UPPER CASE, IS FORMED ACCORDING TO THE FOLLOWING RULES:)LLI4W1H5 !30¬¬NO WORD OF FEWER THAN 3 LETTERS IS LISTE D)HLH5 !30¬¬ALL NON-LETTERS ARE TREATED AS WORD DELIMITERS, EXCEPT FOR "¢" WHIC H IS IGNORED)HLH5 !30¬¬¢COMMAND ¢WORDS ARE IGNORED)HLH5 !30¬¬CASE OF THE PRINT ED TEXT IS IGNORED, BUT THE INPUT)U MUST BE IN UPPER CASE)U (SEE THE)¢ "SPECI AL KEYPUNCH")¢ CONTROL CARD))HLH5 !30¬¬TEXT, TITLES, AND CONTROL CARDS ALIKE A RE SCANNED)HLH5 !30¬¬WORDS LONGER THAN 40 LETTERS ARE BROKEN UP INTO 40 LETTER SEGMENTS)HLH5 !30¬¬94 COMMON WORDS (SUCH AS "THOUGH", "ALSO", AND "WHERE") ARE SUPPRESSED)IHP THE DICTIONARY IS USEFUL FOR DETERMINING A ROUGH LIST OF CANDIDA TES FOR AN INDEX, AND FOR A SPELLING CHECK. THE)¢ "$LOCATE")¢ ¢EDITOR CONTROL CARD CAN BE USED (IN THE EDIT PHASE) TO FIND THE LOCATION OF "INDEX CANDIDATES" IN CONTEXT.)P THE)¢ DICTIONARY)¢ FACILITY USES DATASET REFERENCE NUMBERS 2 AN D 3 (SEE ¢SECTION ¢I¢X FOR DETAILS).)LLL¢W4 DROP CHARACTER FOR 'D' COMMAND IS) ¢U X)U)P WHEN A TAB COMMAND IS USED TO SKIP OVER BLANK POSITIONS IN A COLUMN L INE, THE SPACES CAN OPTIONALLY BE FILLED WITH A CHARACTER SUCH AS A DOT. THIS CH ARACTER IS CALLED THE "DROP" CHARACTER, SINCE IT MAY BE THOUGHT OF AS BEING "DRO PPED BEHIND" AS THE LINE POSITION MOVES TO THE RIGHT. NORMALLY, THE CHARACTER DR OPPED BY THE "¢D" ¢COMMAND ¢OPERAND (SEE ¢SECTION ¢I¢V) WILL BE A PERIOD. THIS C ONTROL CARD MAY BE USED TO CHANGE THAT CHARACTER, AS FOLLOWS: IF X IS A NUMBER B ETWEEN 10 AND 51, THEN THE DROP CHARACTER WILL BE THE CORRESPONDING SPECIAL CHAR ACTER; IF X LIES BETWEEN 64 AND 255, THE DROP CHARACTER WILL BE THE)¢ EBCDIC)¢ CHARACTER WHOSE REPRESENTATION HAS THAT VALUE; IF IT IS ZERO OR OMITTED, THEN T HE DROP CHARACTER WILL BE RESET TO A PERIOD. THE DEFAULT CHARACTER IS A PERIOD. AS AN EXAMPLE, THE CONTROL CARD)¢ "DROP 30")¢ WOULD DROP "BULLETS" (!30) WHEN THE '¢D' COMMAND OPERAND IS USED.)LLL¢W4 EDITOR)P ¢THIS CONTROL CARD INVOKES T HE)¢ FORMAT)¢ ¢EDITOR, WHICH IS DESCRIBED IN ¢SECTION ¢V¢I. IF USED, THIS CONT ROL CARD MUST BE THE FIRST OF THE JOB AND MUST BE PART OF THE ¢SYSTEM ¢INPUT DAT ASET.)LLL¢W4 FOOTER ON LINE)¢U X)¢U PRINT POSITION)¢U Y)¢U PRECEDED BY)¢U Z)¢U BLANK LINES)¢P ¢THE FOOTER IS PLACED INTO THE PRINT PAGE BEGINNING ON LIN E)U X)U AT PRINT POSITION)U Y,)U AND IS SEPARATED FROM THE LAST LINE OF TEXT

BY AT LEAST)U Z)U BLANK LINES. THIS CONTROL CARD, IF USED, MUST BE FOLLOWED I
MMEDIATELY BY THE FOOTER TEXT. THE TEXT OF THE FOOTER)U MUST)U BE ENDED BY THE
"¢E" ¢COMMAND ¢OPERAND. AFTER THE FOOTER TEXT, THE ONLY ALLOWABLE CONTROL CARD
IS THE)¢ "TITLE")¢ OR THE)¢ "GO")¢ CONTROL CARD. THE FOOTER APPEARS ON EVERY
DOCUMENT PAGE UNTIL IT IS REPLACED (THROUGH THE USE OF ANOTHER)¢ "FOOTER")¢ C
ONTROL CARD.) THE DEFAULT VALUE FOR X IS THE LAST LINE OF THE DOCUMENT PAGE, THE
DEFAULT VALUE FOR Y IS THE PRINT POSITION OF THE LEFT TEXT BORDER OF THE DOCUME
NT, AND THE DEFAULT VALUE FOR Z IS 2.)LLL¢4 ¢G¢O)P THIS IS THE ONLY CONTROL CA
RD REQUIRED BY)¢ FORMAT. GO)¢ SIGNALS THE END OF A CONTROL CARD GROUP, AND INI
TIATES PROCESSING IN NORMAL TEXT MODE.)LLL¢4 INDENTATION OF THE COLUMN IS)¢U
(X1,Y1),...,(X7,Y7))¢U POSITIONS)¢P ¢THIS CONTROL CARD, WHEN USED WITH THE "¢H
" AND "¢I" ¢COMMAND ¢OPERANDS, ENABLES THE USER TO REDUCE THE WIDTH OF TEXT COLU
MNS BY X POSITIONS ON THE LEFT AND Y POSITIONS ON THE RIGHT. SEVEN PAIRS OF COLU
MN INDENTATIONS MAY BE SPECIFIED. THE DEFAULT ACTION IS THAT ALL X'S AND Y'S ARE
ZERO.)LLL¢4 JUSTIFICATION)¢P ¢TEXT IN THE DOCUMENT BODY IS RIGHT-JUSTIFIED W
ITHIN COLUMN-LINES, EXCEPT WHEN A COLUMN-LINE IS TERMINATED BY A ¢COMMAND ¢WORD,
OR WHEN THE LINE CONTAINS TABS. AFTER READING THE INPUT AND ELIMINATING ALL EXT
RA BLANKS,)¢ FORMAT)¢ THEN PERFORMS RIGHT-JUSTIFICATION BY INTRODUCING THE NEC
ESSARY NUMBER OF EXTRA BLANKS, ONE TO EACH WORD DELIMITER, WORKING ALTERNATELY F
ROM THE RIGHT END OF THE LINE LEFTWARD AND THE LEFT END OF THE LINE RIGHTWARD ON
SUCCESSIVE LINES. THE NUMBER OF BLANKS BETWEEN INPUT TEXT WORDS IS IGNORED.)¢
FORMAT)¢ DOES NO HYPHENATION, WHICH MEANS THAT COLUMN-LINES CONTAINING LONG WOR
DS MAY HAVE LARGE GAPS BETWEEN WORDS. THE DEFAULT ACTION IS RIGHT-JUSTIFICATION.
(¢SEE THE)¢ "NO JUSTIFICATION")¢ CONTROL CARD.))LLL¢4 LEFT TOP POSITION FOR
PAGE NUMBER)¢P ¢THE PAGE NUMBER (IF ANY) IS PLACED ON LINE 1 ALIGNED WITH THE
LEFT TEXT BORDER. THE DEFAULT ACTION IS THAT IT IS ALIGNED WITH THE RIGHT TEXT B
ORDER. (¢SEE THE)¢ "CYCLE PAGE NUMBER", "PAGE NUMBER",)¢ AND)¢ "RIGHT TOP POS
ITION")¢ CONTROL CARDS.))LLL¢4 LINES PER PAGE ARE)¢U X)UP ¢THE NUMBER OF LI
NES OF ALL KINDS (INCLUDING TEXT LINES, PARAGRAPH SEPARATION LINES, TITLE LINES,
AND BLANK LINES) WHICH ARE ALLOWED ON A DOCUMENT PAGE IS X. THE OPERAND MAY BE
ANY NUMBER IN THE RANGE 5 THROUGH 1000. THE DEFAULT NUMBER IS 59.)LLL¢4 LIST T
HE INPUT DATASET)P ¢THIS CONTROL CARD IS IDENTICAL IN EFFECT TO THE)¢ "CREATE
A TAPE")¢ CONTROL CARD.)LLL¢4 NO CAPITALIZATION AUTOMATICALLY)¢P ¢NO CAPITAL
S ARE AUTOMATICALLY PRODUCED. THIS IS ALSO THE DEFAULT. (¢SEE THE)¢ "CAPITALIZE
AUTOMATICALLY")¢ CONTROL CARD.))LLL¢4V
NO JUSTIFICATION
GO
)¢ NO JUSTIFICATION)¢P ¢THE TEXT IS NOT RIGHT-JUSTIFIED (AS ILLUSTRATED IN THIS
PARAGRAPH, WHICH WILL HAVE AN UNEVEN RIGHT MARGIN.) THE NUMBER OF BLANKS BETWEE
N INPUT TEXT WORDS IS IGNORED. THE DEFAULT ACTION IS RIGHT-JUSTIFICATION OF TEXT
.)V
JUSTIFICATION
BACKSPACE CHARACTER RESET TO 0 (TURN BACKSPACING OFF)
GO
)LLL¢4 NONTRIVIAL BLANK IS REPRESENTED BY SPECIAL CHARACTER)¢U NN)U)P TO FAC
ILITATE THE USE OF THE NON-TRIVIAL (OR NON-ELIMINATABLE) BLANK FROM DEVICES (SUC
H AS ¢I¢B¢M 2741 TERMINALS) WHICH DO NOT ALLOW IT TO BE ENTERED IN THE SOURCE ST
REAM, THE USER MAY MAKE THE APPEARANCE OF ONE OF THE SPECIAL CHARACTERS BE EQUIV
ALENT TO THE PRESENCE OF A NON-TRIVIAL BLANK. THE NUMBER)U NN)U MUST BE BETWEE
N 10 AND 51; OTHERWISE NO CHARACTER WILL BE REPLACED BY THE NON-TRIVIAL BLANK WH
EN IT IS ENCOUNTERED. NOTE THAT THE)U ACTUAL)U SPECIAL CHARACTER MUST BE PRESE
NT TO BE REPLACED, AND NOT THE "SPECIAL CHARACTER REPRESENTATION" !NN, WHICH WIL
L BE TREATED NORMALLY. FOR EXAMPLE, IF THE NONTRIVIAL BLANK IS REPRESENTED BY SP
ECIAL CHARACTER NUMBER 46 (@), THEN THE TEXT "HERE@@@@@THERE" WOULD BE PRINTED A
S "HERE¬¬¬¬¬THERE", AND THE NON-TRIVIAL BLANKS ARE NOT ELIMINATED AS ORDINARY BL
ANKS WOULD BE. THIS EQUIVALENCE ALSO TAKES EFFECT IN TITLES AND FOOTERS. THE DEF
AULT IS THAT NO SUCH EQUIVALENCE IS MADE.)LLL¢4 NULL CHARACTER SWITCH SET TO)
¢U X)U)P NON-TRIVIAL BLANKS (OR)U NULL)U CHARACTERS) ARE NORMALLY IGNORED FO
R CENTERING OR UNDERLINING PURPOSES WHEN THEY ARE AT THE END OF A WORD. IF X HAS
THE VALUE 2, THEY WILL NOT BE IGNORED WHEN CENTERING AND UNDERLINING (UNDER CON

TROL OF THE "¢M" AND "¢U" ¢COMMAND ¢OPERANDS, RESPECTIVELY). IF X HAS ANY OTHER VALUE, IT WILL BE SET TO 1, WHICH IMPLIES THAT NULL CHARACTERS WILL BE TREATED N ORMALLY. THE DEFAULT SETTING IS 1. THE EFFECT OF THIS CARD DOES NOT APPLY IN ¢TI TLES OR ¢FOOTERS.)LLL¢W4 OUTPUT MEDIUM IS TAPE)P ¢THE OUTPUT FROM)¢ FORMAT)¢ IS WRITTEN ONTO DATASET REFERENCE NUMBER 8 FROM THE POINT AT WHICH THIS CONTROL CARD IS READ. AT THE CONCLUSION OF THE JOB(S) THE TAPE IS COPIED ONTO THE ¢SYST EM ¢OUTPUT DATASET THE NUMBER OF TIMES SPECIFIED ON THE LAST READ)¢ "COPIES =) ¢ X" CONTROL CARD; OR ONCE, IF MULTIPLE COPIES ARE NOT SPECIFIED. THE TAPE CAN T HEN BE LISTED AT SOME OTHER TIME, USING THE)¢ "PRINT OUTPUT TAPE")¢ CONTROL CA RD.)LLL¢W4 PAGE NUMBER STARTING AT)¢U X)UP ¢THE PAGE NUMBER STARTS AT X (IF N ON-BLANK AND NON-ZERO) AND IS PLACED ON LINE 1 OF EACH DOCUMENT PAGE. IF X IS ZE RO OR BLANK, PAGE NUMBERING IS SUPPRESSED. THE DEFAULT PAGE NUMBER IS 1. (¢SEE T HE)¢ "CYCLE PAGE NUMBER", "LEFT TOP POSITION",)¢ AND)¢ "RIGHT TOP POSITION") ¢ CONTROL CARDS.) IF PAGE NUMBERING IS REQUESTED (BY THE)¢ "RIGHT TOP POSITION")¢ OR)¢ "LEFT TOP POSITION")¢ CONTROL CARDS), THEN ENOUGH CHARACTER POSITIONS MUST BE RESERVED AT BOTH THE TOP LEFT AND TOP RIGHT CORNERS OF THE PAGE FOR THE DIGITS OF THE PAGE NUMBER, WHETHER OR NOT THE NUMBER WILL ACTUALLY APPEAR IN BO TH POSITIONS.)LLL¢W4 PARAGRAPH INDENT IS)¢U X)UP ¢THE NUMBER OF PRINT POSITIO NS SKIPPED AT THE START OF A PARAGRAPH IS X. THE DEFAULT INDENTATION IS 5 PRINT POSITIONS.)LLL¢W4 PRINT OUTPUT TAPE)P ¢THE PRESENCE OF THIS CONTROL CARD MEANS THAT THE USER HAS PLACED A ¢F¢O¢R¢M¢A¢T-GENERATED OUTPUT DATASET (USUALLY A TAP E) ONTO DATASET REFERENCE NUMBER 8, AND THAT HE WISHES TO LIST IT ONTO THE ¢SYST EM ¢OUTPUT DATASET THE NUMBER OF TIMES SPECIFIED ON THE MOST RECENT)¢ "COPIES =)¢ X" CONTROL CARD; OR, IF NONE, ONCE. THIS ACTION IS IMMEDIATE, NO DOCUMENT IS FORMED FROM AN INPUT DATASET, AND NO CONTROL CARDS OR ERROR DIAGNOSTICS RELATIN G TO THE CURRENT INPUT ARE WRITTEN. IT IS SUGGESTED THAT THE TAPE BE FILE-PROTEC TED.)LLL¢W4 PUNCH THE INPUT DATASET)P ¢THE EFFECT OF THIS CONTROL CARD IS IDEN TICAL TO THAT OF THE)¢ "CREATE A TAPE")¢ CONTROL CARD, AND IN ADDITION, THE NE WLY CREATED CONDENSED INPUT DECK IS PUNCHED (I.E., WRITTEN ONTO THE ¢SYSTEM ¢PUN CH DATASET) AS WELL AS LISTED AT THE CONCLUSION OF THE RUN.)LLL¢W4 REPEAT TITLE ON EVERY PAGE)¢P ¢THE TITLE (IF ANY) IS PRINTED ON EVERY PAGE OF THE DOCUMENT. THE DEFAULT ACTION LIMITS THE APPEARANCE OF THE TITLE TO THE NEXT PAGE PRODUCED . (¢SEE THE)¢ "STOP PRINTING TITLE")¢ CONTROL CARD.) NOTE THAT THE TITLE AND F OOTER PRINTED FOR A GIVEN PAGE OF TEXT ARE THOSE IN EFFECT WHEN THE END OF THE C URRENT PAGE IS REACHED. THIS MEANS THAT CHANGING THE TITLE OR FOOTER WHEN TEXT I S BEING ACCUMULATED IN MID-PAGE WILL PLACE THE NEW TITLE OR FOOTER ON THE CURREN T PAGE, REPLACING THE OLD ONE (POSSIBLY BEFORE IT WAS EXPECTED TO).)LLL¢W4 RIGH T TOP POSITION FOR PAGE NUMBER)¢P ¢THE PAGE NUMBER (IF ANY) IS PLACED ON LINE 1 ALIGNED WITH THE RIGHT TEXT BORDER. THE DEFAULT ACTION IS THE SAME AS THE ACTIO N OF THIS CONTROL CARD. (¢SEE THE)¢ "CYCLE PAGE NUMBER", "LEFT TOP POSITION",) ¢ AND)¢ "PAGE NUMBER")¢ CONTROL CARDS.))LLL¢W4 SENTENCES SEPARATED BY AT LEAS T)¢U X)U¢ SPACES)¢)P ¢TEXT SENTENCES ARE SEPARATED ON THE SAME COLUMN-LINE (WHEN NOT IN AN "AS IS" REGION; SEE ¢SECTION ¢I¢V) BY X BLANKS WITH)¢ "NO JUSTIF ICATION")¢ IN EFFECT, AND BY A MINIMUM OF X BLANKS WITH)¢ "JUSTIFICATION")¢ I N EFFECT. THE VALUE OF X MAY BE 1 OR 2; IF IT IS NOT 2, IT WILL BE SET TO 1. THE DEFAULT VALUE FOR X IS 1. NOTE THAT)¢ FORMAT)¢ WILL INSERT A)U MINIMUM)U OF X BLANKS, SO THAT EXTRA BLANKS MIGHT APPEAR. IF AN EXACT NUMBER OF SPACES IS NE EDED, USE THE NON-TRIVIAL BLANK.)LLL¢W4 SEPARATION LINES BETWEEN PARAGRAPHS ARE)¢U X)UP ¢THE NUMBER OF BLANK PRINTER LINES BETWEEN PARAGRAPHS IS X. THE DEFAU LT NUMBER IS 1.)LLL¢W4 SIDE BY SIDE COPIES)¢P ¢TWO COPIES OF THE DOCUMENT ARE PRODUCED SIMULTANEOUSLY, SIDE BY SIDE. THE DEFAULT ACTION IS NOT TO PRINT SIDE B Y SIDE COPIES. THERE MUST BE ENOUGH SPACE TO FIT TWO COPIES OF THE PRINTED TEXT, AND AT LEAST ONE SEPARATING SPACE, INTO A 132-CHARACTER PRINT LINE.)LLL¢W4 SPA CING OF TEXT LINES IS)¢U X)UP ¢THE SPACING FOR THE DOCUMENT IS X (E.G., X¬=¬1 MEANS SINGLE SPACING, X¬=¬2 MEANS DOUBLE SPACING, ETC.). THE DEFAULT ASSUMPTION IS SINGLE SPACING.)LLL¢W5 SPECIAL KEYPUNCH)L SPECIAL KEYPUNCH IS A 2741)¢P ¢T HIS CONTROL CARD SPECIFIES THAT THE TEXT INPUT ORIGINATED ON AN UPPER AND LOWER CASE KEYPUNCH, OR ON ANY DEVICE PRODUCING THE SPECIFIC)¢ EBCDIC)¢ CODE FOR EAC H CHARACTER DESIRED. CASE IS NOT ALTERED BY THE PROGRAM, AND (FOR THE FIRST FORM OF THIS CONTROL CARD) THE ¢SPECIAL ¢OPERAND "¢" DOES NOT PRODUCE SUPERSCRIPTS.

THE DEFAULT ACTION IS THE USUAL CASE AND SUPERSCRIPT CONVERSION. THE)¢ "SPECIAL KEYPUNCH")¢ CONTROL CARD ALLOWS THE USER TO PREPARE UPPER AND LOWER CASE INPUT FROM A TERMINAL, BUT STILL BE ABLE TO OBTAIN SUPERSCRIPTS THROUGH THE USE OF TH E "¢¢N" ¢SPECIAL ¢OPERAND TECHNIQUE. IF THERE IS ANY OTHER NUMERIC QUANTITY ON T HIS CONTROL CARD, THE NORMAL)¢ "SPECIAL KEYPUNCH")¢ WILL BE ASSUMED. NOTE THAT THE EFFECT OF THIS CARD CAN BE CHANGED FROM 2741 MODE TO NORMAL)¢ SPECIAL KEYP UNCH)¢ MODE AND BACK, BUT THERE IS NO WAY TO RETURN FROM EITHER TO THE NORMAL M ODE, WHERE UPPER-CASE-ONLY INPUT IS ASSUMED.)LLL¢W4 SPECIAL PRINTER TRAIN)¢P T HIS CONTROL CARD IMPLIES THAT THE ULTIMATE PRINTER OF THE DOCUMENT CANNOT PRINT LOWER CASE OR SUPERSCRIPT CHARACTERS. THEREFORE, NO TRANSLATION TO LOWER CASE OR SUPERSCRIPTS IS MADE. THE DEFAULT ACTION IS THAT THE TRANSLATION IS MADE.)LLL¢ W4 STOP PRINTING TITLE ON EVERY PAGE)¢P ¢THE TITLE (IF ANY) IS ONLY PRINTED ON THE NEXT PAGE PRODUCED. THE DEFAULT ACTION IS THE SAME AS THE ACTION OF THIS CON TROL CARD. (¢SEE THE)¢ "REPEAT TITLE")¢ CONTROL CARD.))LLL¢W4 TABS ARE SET AT)¢U X1,...,X14)UP ¢THE OPERAND FIELDS OF THIS CONTROL CARD SPECIFY THE POSITIO NS OF UP TO 14 TAB STOPS. THESE ARE GIVEN AS RELATIVE CHARACTER POSITIONS WITHIN THE TEXT COLUMN-LINE (E.G., A TAB SET AT 10 MEANS THAT THE TAB FIELD BEGINS IN CHARACTER POSITION 10 IN EACH COLUMN-LINE; THE FIRST WORD FOLLOWING A TAB FROM A NY POSITION IN THE COLUMN-LINE BEFORE POSITION 10 WILL BE PLACED IN THE LINE STA RTING IN CHARACTER POSITION 10). TABS MUST BE SET IN ASCENDING ORDER, AND NO TAB MAY BE SET AT A POSITION GREATER THAN THE COLUMN WIDTH. THE ACTION OF THIS CONT ROL CARD IS ANALOGOUS TO THE ACTION OF THE "TAB SET" KEY ON A TYPEWRITER. THE DE FAULT ACTION IS THAT NO TABS ARE SET.)LLL¢W4 TAPE INPUT DATASET)P ¢THE PRESENC E OF THIS CONTROL CARD MEANS THAT THE USER HAS PLACED A TAPE INPUT DATASET ONTO DATASET REFERENCE NUMBER 2. IT IS SUGGESTED THAT THE TAPE BE FILE-PROTECTED. IF THIS CONTROL CARD IS USED IT MUST BE THE FIRST CONTROL CARD OF THE JOB AND MUST BE PART OF THE ¢SYSTEM ¢INPUT DATASET. THIS CONTROL CARD CALLS THE)¢ FORMAT)¢ ¢EDITOR; THEREFORE, ¢EDITOR CONTROL CARDS MAY FOLLOW IT (SEE ¢SECTION ¢V¢I). IT IS IDENTICAL IN EFFECT TO THE)¢ "EDITOR")¢ CONTROL CARD, EXCEPT THAT NO LISTIN G OF THE EDITED TAPE IS REQUESTED.)LLL¢W6 TEXT STARTS ON LINE)¢U X)U¢ IN PRIN T POSITION)¢U Y)UL OR)L)¢ START TEXT ON LINE)¢U X)U¢ IN PRINT POSITION)¢U Y)UP ¢THE FIRST LINE OF THE TEXT IS PRINTER LINE X, AND THE FIRST PRINT POSITI ON IS Y. THE DEFAULT IS LINE 5 AND THE DOCUMENT IS CENTERED ON THE PRINTER. THES E CONTROL CARDS ARE ENTIRELY EQUIVALENT, AND THE TWO FORMS ARE PROVIDED AS A CON VENIENCE.)LLL¢W4 TITLE STARTS ON LINE)¢U X)U¢ IN PRINT POSITION)¢U Y)UP ¢TH E FIRST PRINTER LINE OF THE TITLE IS X, AND THE FIRST PRINT POSITION OF THE TITL E IS Y. THIS CONTROL CARD, IF USED, MUST BE FOLLOWED IMMEDIATELY BY THE CARD IMA GES CONTAINING THE TITLE AND THE "¢G¢O" OR)¢ "FOOTER")¢ CONTROL CARD. (¢REMEMB ER THAT THE TITLE TEXT MUST END WITH THE "¢E" ¢COMMAND ¢OPERAND.) THE TITLE MUST BE POSITIONED ABOVE THE BODY OF THE DOCUMENT. CONFLICTS OF THE TITLE WITH THE P AGE NUMBER ARE RESOLVED IN FAVOR OF THE PAGE NUMBER, AT BOTH OF THE TOP CORNERS OF THE PAGE. THE DEFAULT TITLE LINE IS PRINTER LINE 2, AND THE DEFAULT PRINT POS ITION IS THAT OF THE LEFT TEXT BORDER.)LLL¢W4 UNDERLINE SWITCH SET TO)¢U X)UP IF X IS NOT ZERO, THE UNDERLINING ALGORITHM OF)¢ FORMAT)¢ IS MODIFIED SO THAT THE LEADING AND TRAILING CHARACTERS OF AN UNDERLINED STRING WILL NOT BE UNDERLI NED IF THEY ARE ANY OF THE FOLLOWING TEN PUNCTUATION OR SPECIAL CHARACTERS: PERI OD, COMMA, COLON, SEMICOLON, QUESTION MARK, EXCLAMATION POINT, QUOTATION MARK, A POSTROPHE, AND LEFT OR RIGHT PARENTHESIS. IF X IS ZERO OR BLANK, ALL CHARACTERS IN THE STRING ARE UNDERLINED. THE DEFAULT VALUE OF X IS ZERO. TO GIVE AN EXAMPLE , SUPPOSE THE INPUT TEXT REQUIRES THAT ((¢X)) BE UNDERLINED. THEN)V
BACKSPACE CHARACTER IS 50 (?)
GO
)LLM (?_(?_¢X?_)?_)?_ AND ((¢X?_)))LLM WOULD BE PRODUCED BY SETTING THE UNDERLI NE SWITCH TO ZERO OR NONZERO RESPECTIVELY.)V
BACKSPACE 0 (RESET)
GO
)LLL¢W4 WIDTH OF COLUMNS IS)¢U X)U¢ PRINT POSITIONS)¢P ¢THE WIDTH IN PRINT PO SITIONS OF EACH TEXT COLUMN IS X. THE DEFAULT WIDTH IS 64 PRINT POSITIONS. IF A SINGLE COLUMN PER PAGE IS SPECIFIED, AND THE WIDTH IS CHOSEN TO BE 132 CHARACTER S (THE MAXIMUM), THEN THE MAXIMUM NUMBER OF LINES IS 59.)¢ FORMAT)¢ ALLOTS 59*

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132, OR 7788, CHARACTERS FOR EACH PAGE OF THE TEXT. THE MAXIMUM ALLOWABLE COLUMN
 WIDTH, W, IS COMPUTED AS FOLLOWS: )LLW3A
                !16MIN(7788/¢L,132)!17/C - S + 1 - B * (N - 1)
           W = ---------------------------------------------
                                      N
)
)LW5 WHERE: )LL ¢L = LINES PER PAGE (FROM )¢ "LINES PER PAGE" )¢ CONTROL CARD) )
L C = 2 IF )¢ "SIDE BY SIDE" )¢ CONTROL CARD IS IN EFFECT; )L ¬¬= 1 OTHERWISE )L
 S = STARTING PRINT POSITION (FROM )¢ "TEXT STARTS ON" )¢ CONTROL CARD) )L B = S
PACES BETWEEN COLUMNS (FROM )¢ "BETWEEN COLUMNS" )¢ CONTROL CARD) )L N = NUMBER
OF TEXT COLUMNS (FROM )¢ "COLUMNS/PAGE" )¢ CONTROL CARD) )LLL¢W4 026 KEYPUNCH )¢
P ¢THIS CONTROL CARD SPECIFIES THAT THE ¢COMMAND ¢WORDS USED IN THE INPUT CARDS
HAVE BEEN PUNCHED ON AN )¢ IBM )¢ 026 ¢KEYPUNCH, OR ANY KEYPUNCHING DEVICE WHICH
 PUNCHES 12-8-4 FOR THE CHARACTER USED TO BEGIN ¢COMMAND ¢WORDS !16NOMINALLY ")"
!17. THE DEFAULT ACTION ASSUMES THE )¢ IBM )¢ 029 CONFIGURATION FOR THE ")", WHI
CH IS 11-8-5. )LLL¢W4 029 KEYPUNCH )¢P ¢THIS CONTROL CARD SPECIFIES THAT THE ¢CO
MMAND ¢WORDS USED IN THE INPUT CARDS HAVE BEEN PUNCHED ON AN )¢ IBM )¢ 029 ¢KEYP
UNCH, OR ANY KEYPUNCHING DEVICE WHICH PUNCHES 11-8-5 FOR THE CHARACTER USED TO B
EGIN ¢COMMAND ¢WORDS !16NOMINALLY ")"!17. THE DEFAULT ACTION IS THE SAME AS THE
ACTION PRODUCED BY THIS CONTROL CARD. )SU ¢EXAMPLES OF ¢CORRECT ¢CONTROL ¢CARDS
)ULLLA
!161!17 . . . . . .¢CARD ¢COLUMNS. . . . )¢ . . . . . .!1680!17

TAB SET    5   10   15   20
   TABS ARE SET AT PRINT POSITIONS 5, 10, 15 AND 20
          TABULATE TO 5 10 15 20
 TAB5 10*                          15                        20

START THE TEXT ON LINE 10, PRINT POSITION 20
START THE TEXT ON LINE 10  PRINT POSITION 20
  START D OCUMENT:   LINE = 10, P. POSITION = 20
STA      10    20
 TEXT STARTS ON LINE 10, PRINT POSITION 20

TEXT STARTS IN DEFAULT POSITION
  S T A R T   T E X T   0   ,   10
       START  TEXT   0    10
TEXT STARTS ON LINE 5 IN PRINT POSITION 10

TITLE
TITLE STARTS ON LINE 5 ABOVE LEFT TEXT BORDER

BACKSPACE CHARACTER IS NUMBER 50 (THE QUESTION MARK)
BACK 50 (?)

DAR 2
NO J              MEANS DON'T JUSTIFY
)
)¢LLLU ¢EXAMPLES OF ¢FAULTY ¢CONTROL ¢CARDS )ULL¢LA
GO NOW
BEGIN TEXT
    )¢ (¢AN UNRECOGNIZABLE CONTROL CARD IS TREATED AS A "¢G¢O" CARD) )¢
START TEXT:   ,7
    )¢ (¢TEXT STARTS ON LINE 7 IN THE DEFAULT PRINT POSITION) )¢
TABS = 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    )¢ (¢THE 15TH TAB STOP IS IGNORED) )¢
   LINES/PAGE = 5 7
    )¢ (¢THE NUMBER OF LINES PER PAGE WILL BE 5, NOT 57) )¢
COLUMNS/PAGE = TWO
    )¢ (¢THE NUMBER OF COLUMNS/PAGE WILL BE THE DEFAULT VALUE)       )¢
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BACKSPACE CHARACTER IS NUMBER 43 (¢)
)¢ (¢ CANNOT BE USED AS THE BACKSPACE CHARACTER)
)
)S ¢I¢V.)U ¢COMMAND ¢OPERANDS AND ¢COMMAND ¢WORDS)ULLP ¢A ¢COMMAND ¢OPERAND IS AN IMPERATIVE ORDER TO PERFORM AN IMMEDIATE TEXT-CONTROL FUNCTION. ¢COMMAND ¢OPERANDS CAN BE INTERSPERSED AS DESIRED THROUGHOUT THE TEXT INPUT IN THE FORM OF ¢COMMAND ¢WORDS. A ¢COMMAND ¢WORD IS A STRING OF ONE OR MORE ¢COMMAND ¢OPERANDS IN THE ORDER OF DESIRED EXECUTION, PREFIXED BY THE CHARACTER ")", AND FOLLOWED BY A BLANK. (¢SEE THE)¢ "026 KEYPUNCH")¢ AND)¢ "029 KEYPUNCH")¢ CONTROL CARDS IN ¢SECTION)¢ III).)¢P SOME ¢COMMAND ¢OPERANDS MAY BE USED IN TITLES (INCLUDING FOOTERS), AS NOTED IN THE FOLLOWING PARAGRAPHS. IN ADDITION, SOME OF THE ¢COMMAND ¢OPERANDS ("¢D", "¢H", "¢I", "¢T", AND "¢W") MAY BE FOLLOWED BY A NUMERIC QUANTITY, AS IN ")¢T4".)P THE FUNCTIONS OF THE ¢COMMAND ¢OPERANDS ARE DESCRIBED BELOW. WHEREVER A SINGLE LETTER APPEARS IN QUOTATION MARKS (LIKE "¢L"), ITS USE AS A ¢COMMAND ¢OPERAND (LIKE ")¢L") IS IMPLIED; OTHERWISE, THAT LETTER MAY APPEAR FREELY IN THE TEXT MATERIAL. IT IS IMPORTANT TO REMEMBER THAT ALL ¢COMMAND ¢OPERANDS ARE RECOGNIZED BY)¢ FORMAT)¢ ONLY IF THEY ARE IN UPPER CASE.)LLLLLL ¢A -- ¢ENTER THE "AS IS" TEXT MODE. IN THIS MODE, EACH CARD IMAGE IS AN INTEGRAL UNIT AND IS PRINTED ON A SEPARATE COLUMN-LINE WITHOUT CHANGE TO THE SPACING OF TEXT, EXCEPT THAT THE ¢SPECIAL ¢OPERANDS, AND CERTAIN OF THE ¢COMMAND ¢OPERANDS, TAKE NO PRINT POSITIONS. BOTH OF THE ¢SPECIAL ¢OPERANDS, AND THE ¢COMMAND ¢OPERANDS "¢" AND "¢F", ARE EFFECTIVE IN THIS MODE. THE CONTENT OF A CARD IMAGE BEYOND THE EFFECTIVE COLUMN WIDTH IS NOT PRINTED. THE "AS IS" TEXT MODE IS ENDED WHEN ")B" (WHERE B = BLANK) OCCURS IN THE)U FIRST TWO)U POSITIONS OF THE CARD IMAGE;)¢ FORMAT)¢ THEN RESUMES READING IN NORMAL TEXT MODE. (¢THE ¢COMMAND ¢OPERAND "¢A" IS NOT RECOGNIZED IN "AS-IS" TEXT MODE, SO ")¢A" CANNOT BE USED TO TERMINATE "AS-IS" MODE.) THE ¢COMMAND ¢OPERAND "¢A" IS NOT VALID IN TITLES.)LLL ¢C -- ¢BEGIN THE NEXT TEXT COLUMN. THE ¢COMMAND ¢OPERAND "¢C" IS NOT VALID IN TITLES OR FOOTERS.)LLLW2 ¢DN -- ¢TAB, LIKE "¢T", LEAVING A STRING OF DOTS (PERIODS) INSTEAD OF BLANKS. THE STRING OF DOTS IS PREFACED BY ONE BLANK. THE CHARACTER TO BE "DROPPED" MAY BE CHANGED FROM A DOT TO ANY OTHER CHARACTER WITH THE)¢ "DROP CHARACTER")¢ CONTROL CARD. FOR A DETAILED DESCRIPTION OF THE "¢D" ¢COMMAND ¢OPERAND, SEE THE DESCRIPTION OF THE "¢T" ¢COMMAND ¢OPERAND BELOW. THE ¢COMMAND ¢OPERAND "¢D" IS NOT VALID IN TITLES OR FOOTERS.)LLLW2 ¢E -- ¢END THE JOB, OR END THE FOOTER OR TITLE; THE NEXT CARD WILL BE READ IN CONTROL CARD MODE. AS MANY)¢ FORMAT)¢ JOBS AS DESIRED MAY BE STACKED ONE BEHIND THE OTHER. JOBS ON CARDS MUST PRECEDE JOBS WHICH ARE TAPE RESIDENT.)LLLW2 ¢F -- ¢BEGIN CAPITALIZING EACH WORD, CONTINUING UNTIL ANOTHER "¢F", "¢P", "¢S", OR "¢V" ¢COMMAND ¢OPERAND OCCURS. THE ¢COMMAND ¢OPERAND "¢F" IS VALID IN TITLES AND FOOTERS, AND IN "AS-IS" TEXT MODE.)LLL ¢HN -- ¢REDUCE THE COLUMN WIDTH STARTING WITH THE)U NEXT)U COLUMN-LINE. IF)U NO)U "HANGING" (DELAYED) INDENT IS CURRENTLY IN USE, THEN N REFERS TO THE NTH PAIR OF ARGUMENTS ON THE)¢ "INDENT COLUMN")¢ CONTROL CARD; IF N IS BLANK, ZERO, OR ONE, THE FIRST PAIR IS REFERENCED. IF A HANGING INDENT)U IS)U CURRENTLY IN USE, THE NTH PAIR OF COLUMN INDENTS REPLACES THE PAIR IN USE, UNLESS THE NTH PAIR IS THE ONE BEING USED, IN WHICH CASE THE HANGING INDENT IS TURNED OFF. IF ANY HANGING INDENT IS IN EFFECT, A BLANK OR ZERO VALUE FOR N TURNS IT OFF, AS DOES THE ¢COMMAND ¢OPERAND "¢S". THE ¢COMMAND ¢OPERANDS "¢H" AND "¢I" MAY BE USED INDEPENDENTLY OF EACH OTHER. THE ¢COMMAND ¢OPERAND "¢H" IS NOT VALID IN TITLES OR FOOTERS.)LLL ¢IN -- ¢REDUCE THE COLUMN WIDTH IMMEDIATELY, AND TERMINATE THE CURRENT COLUMN-LINE. IF)U NO)U IMMEDIATE INDENT IS CURRENTLY IN USE, THEN N REFERS TO THE NTH PAIR OF ARGUMENTS ON THE)¢ "INDENT COLUMN")¢ CONTROL CARD; IF N IS BLANK, ZERO, OR ONE, THE FIRST PAIR IS REFERENCED. IF AN IMMEDIATE INDENT)U IS)U CURRENTLY IN USE, THE NTH PAIR OF COLUMN INDENTS REPLACES THE PAIR IN USE, UNLESS THE NTH PAIR IS THE ONE BEING USED, IN WHICH CASE THE IMMEDIATE INDENT IS TURNED OFF. IF)U ANY)U IMMEDIATE INDENT IS IN EFFECT, A BLANK OR ZERO VALUE FOR N TURNS IT OFF, AS DOES THE ¢COMMAND ¢OPERAND "¢S". THE ¢COMMAND ¢OPERANDS "¢I" AND "¢H" MAY BE USED INDEPENDENTLY OF EACH OTHER. THE ¢COMMAND ¢OPERAND "¢I" IS NOT VALID IN TITLES OR FOOTERS.)LLL ¢J -- ¢START THE NEXT COLUMN-LINE. THE ACTION OF THIS ¢COMMAND ¢OPERAND IS IDENTICAL TO THE ACTION OF "¢L", EXCEPT THAT IT IS NOT VALID IN TITLES AND IS EFFECTIVE AT)U ANY)U LINE IN THE TEXT.

UNLIKE "¢L", IT IS NOT IGNORED AT THE TOP OF A COLUMN.)LLLW2 ¢K -- ¢KEEP THE FO LLOWING TEXT, UNTIL THE NEXT OCCURRENCE OF "¢K", IN THE CURRENT TEXT COLUMN, IF POSSIBLE. (¢A SEGMENT OF TEXT DELIMITED BY "¢K" ¢COMMAND ¢OPERANDS IS CALLED "KE PT TEXT" OR A "KEEP".) OTHERWISE, START THIS BLOCK OF TEXT IN THE NEXT TEXT COLU MN. THE ¢COMMAND ¢OPERAND "¢K" IS NOT VALID IN TITLES AND FOOTERS, AND TERMINATE S THE COLUMN-LINE ON WHICH IT OCCURS. IF THIS ¢COMMAND ¢OPERAND IS USED, THE PRO GRAM REQUIRES DATASET REFERENCE NUMBER 2. BACKSPACES DO NOT WORK PROPERLY INSIDE "KEPT" TEXT. SEE THE DESCRIPTION OF THE "¢W" ¢COMMAND ¢OPERAND ALSO.)LLLW2 ¢L -- ¢START THE NEXT COLUMN-LINE, IF NOT AT THE FIRST LINE OF A TEXT COLUMN. THE A CTION OF THIS ¢COMMAND ¢OPERAND IS SIMILAR TO THE ACTION PRODUCED BY STRIKING TH E "RETURN" BUTTON ON AN ELECTRIC TYPEWRITER. "¢L" IS VALID IN TITLES. IF "¢L" IS USED IN A TITLE, THE NEXT PRINTER LINE IS BEGUN; IF "¢L" IS USED IN THE BODY OF THE DOCUMENT THE NEXT COLUMN-LINE IS BEGUN, LEAVING)¢ ("SPACING" - 1))¢ BLANK LINES BETWEEN. IF "¢L" IS USED AT THE TOP OF A TEXT COLUMN, IT IS IGNORED.)LLL ¢M -- ¢BEGIN CENTERING TEXT WITHIN THE COLUMN-LINE, AND CONTINUE DOING SO FOR S UCCESSIVE LINES UNTIL ANOTHER "¢M", "¢P", OR "¢S" OCCURS. THE ¢COMMAND ¢OPERAND "¢M" IS NOT VALID IN TITLES OR FOOTERS; IF CENTERING IS REQUIRED IN A TITLE OR F OOTER, THE APPROPRIATE NUMBER OF NON-TRIVIAL BLANKS MAY BE USED (SEE ¢SECTION ¢V).)LLL ¢P -- ¢BEGIN A NEW PARAGRAPH, LEAVING THE NUMBER OF PRINTER LINES SPECIF IED BY THE)¢ "SEPARATION LINES")¢ CONTROL CARD (OR ITS DEFAULT) BETWEEN PARAGR APHS AND INDENTING THE NUMBER OF PRINT POSITIONS SPECIFIED BY THE)¢ "PARAGRAPH INDENT")¢ CONTROL CARD (OR ITS DEFAULT). A NEW COLUMN IS BEGUN IF AT LEAST TWO COLUMN-LINES OF THE PRESENT COLUMN ARE NOT AVAILABLE FOR THE NEW PARAGRAPH. "¢P" STOPS THE ACTION INITIATED BY ¢COMMAND ¢OPERANDS)¢ "F", "H", "U",)¢ AND "¢". IF)¢ "CAPITALIZE AUTOMATICALLY")¢ IS IN EFFECT, THE NEXT TEXT WORD IS CAPITALI ZED. "¢P" IS NOT VALID IN TITLES.)LLL ¢S -- ¢BEGIN A NEW PAGE. "¢S" STOPS THE A CTION INITIATED BY ¢COMMAND ¢OPERANDS)¢ "F", "H", "I", "M", "U",)¢ AND "¢". IF)¢ "CAPITALIZE AUTOMATICALLY")¢ IS IN EFFECT, THE NEXT TEXT WORD IS CAPITALIZE D. "¢S" IS NOT VALID IN TITLES.)LLL ¢TN -- ¢IF N IS BLANK OR ZERO, TAB TO THE N EXT SET TAB POSITION BEYOND THE PRESENT POSITION IN THE COLUMN-LINE. THE ACTION OF "¢T" CORRESPONDS TO THE ACTION PRODUCED BY STRIKING THE TABULATE KEY ON A TYP EWRITER. RIGHT-JUSTIFICATION, IF IN EFFECT WHEN "¢T" IS USED, WILL NOT BE PERFOR MED FOR THE COLUMN-LINE ON WHICH THE TAB OCCURS. THE "¢D" AND "¢I" ¢COMMAND ¢OPE RANDS MAY BE FOLLOWED BY A NUMBER WHICH SPECIFIES THE TAB STOP TO BE USED. THAT IS, "140¢T4" WILL CAUSE A TABULATION TO THE FOURTH TAB POSITION ON THE CURRENT C OLUMN-LINE. IF THE COMMAND OPERAND IS USED INCORRECTLY, IT WILL BE IGNORED, AND A DIAGNOSTIC MESSAGE WILL BE PRINTED. "¢T" IS NOT VALID IN TITLES.)LLL ¢U -- ¢B EGIN UNDERLINING, CONTINUING UNTIL ANOTHER "¢U", "¢P", OR "¢S" OCCURS. AT MOST 9 9 COLUMN-LINES, OR PORTIONS, MAY BE UNDERLINED PER PAGE. UNDERLINES NEITHER BEGI N NOR END UNDER THE SPACES SKIPPED OVER BY TABBING (PRODUCED BY "¢T" AND "¢D"). UNDERLINES MAY OR MAY NOT BEGIN AND END WITH NON-TRIVIAL BLANKS, DEPENDING ON TH E)¢ "NULL CHARACTER SWITCH")¢ SETTING IN EFFECT (SEE THE)¢ "NULL CHARACTER SW ITCH")¢ CONTROL CARD DESCRIPTION IN ¢SECTION ¢I¢I¢I). UNDERLINES MAY OR MAY NOT BEGIN UNDER PUNCTUATION CHARACTERS, DEPENDING ON THE)¢ "UNDERLINE SWITCH")¢ S ETTING IN EFFECT (SEE THE DESCRIPTION OF THE)¢ "UNDERLINE SWITCH")¢ CONTROL CA RD IN ¢SECTION ¢I¢I¢I). INDIVIDUAL CHARACTERS WITHIN A WORD CANNOT BE UNDERLINED EXCEPT BY BACKSPACING (SEE THE)¢ "BACKSPACE")¢ CONTROL CARD DESCRIPTION IN ¢S ECTION ¢I¢I¢I). THE ¢COMMAND ¢OPERAND "¢U" IS NOT VALID IN TITLES OR FOOTERS.)L LLW2 ¢V -- ¢LEAVE NORMAL TEXT MODE, AND BEGIN TO READ IN THE NEXT GROUP OF CONTR OL CARDS. A CONTROL CARD GROUP MUST IMMEDIATELY FOLLOW THE CARD IMAGE CONTAINING THE "¢V". ALL CHARACTERS FOLLOWING "¢V" ON THE SAME CARD IMAGE ARE IGNORED. "¢V " STOPS THE ACTION INITIATED BY THE ¢COMMAND ¢OPERANDS "¢F" AND "¢". IF)¢ "CAPI TALIZE AUTOMATICALLY")¢ IS IN EFFECT, THE NEXT TEXT WORD IS CAPITALIZED. THE ¢C OMMAND ¢OPERAND "¢V" IS NOT VALID IN TITLES OR FOOTERS.)LLLW2 ¢WN -- ¢KEEP THE NEXT N COLUMN-LINES IN THE SAME TEXT COLUMN. IF N COLUMN-LINES DO NOT REMAIN IN THE CURRENT TEXT COLUMN, START THE NEXT TEXT COLUMN. "¢W" TERMINATES THE COLUMN-LINE ON WHICH IT OCCURS. IT IS NOT VALID IN TITLES. NOTE THAT THE "¢W" ¢COMMAND ¢OPERAND IS SIMILAR IN EFFECT TO "¢K", BUT DOES NOT REQUIRE THE USE OF AN ADDITI ONAL DATASET. "¢W" CAN BE USED TO PREVENT "WIDOWS", WHICH ARE SMALL SEGMENTS OF TEXT LEFT ALONE AT THE BOTTOM OF A COLUMN.)LLLW2 ¢ -- ¢BEGIN PRINTING ALL LETTE

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RS IN UPPER CASE, CONTINUING UNTIL ANOTHER "¢", "¢P", "¢S", OR "¢V" OCCURS. THE
ACTION OF "¢" IS EQUIVALENT TO LOCKING A TYPEWRITER KEYBOARD IN UPPER CASE, AND
THEN UNLOCKING IT. "¢" IS VALID IN TITLES. "¢" DOES NOT CAUSE NUMBERS TO BE PRIN
TED AS SUPERSCRIPTS, IT IS NOT AFFECTED BY PUNCTUATION CHARACTERS, NOR DOES IT C
AUSE LETTERS PUNCHED IN LOWER CASE (AS INDICATED BY A )¢ "SPECIAL KEYPUNCH" )¢ C
ONTROL CARD) TO BE PRINTED AS CAPITALS. (¢SEE THE DESCRIPTION OF THE "¢" ¢SPECIA
L ¢OPERAND IN ¢SECTION ¢V ALSO.) )LLLLW3U ¢SUMMARY OF ¢COMMAND ¢OPERANDS )ULLL 1
. ¢COMMAND ¢OPERANDS ALLOWED IN TITLES AND FOOTERS ARE: "¢E", "¢P", "¢L", AND "¢
". )LL 2. ¢COMMAND ¢OPERANDS WHOSE EFFECT IS ENDED BY "¢P" ARE: "¢F", "¢H", "¢U"
, AND "¢". )LL 3. ¢COMMAND ¢OPERANDS WHOSE EFFECT IS ENDED BY "¢S" ARE: "¢F", "¢
H", "¢I", "¢M", "¢U", AND "¢". )LL 4. ¢COMMAND ¢OPERANDS WHICH TERMINATE THE COL
UMN-LINE IN WHICH THEY APPEAR ARE: "¢A", "¢C", "¢E", "¢I", "¢J", "¢K", "¢L", "¢M
", "¢P", "¢S", "¢V", AND "¢W". )LL 5. ¢COMMAND ¢OPERANDS WHICH CAUSE CAPITALIZAT
ION OF THE NEXT TEXT LETTER (IF )¢ "CAPITALIZE AUTOMATICALLY" )¢ IS IN EFFECT) A
RE: "¢P", "¢S", AND "¢V". )LL 6. ¢COMMAND ¢OPERANDS VALID IN "AS-IS" REGIONS ARE
: "¢F" AND "¢". )LL 7. ¢COMMAND ¢OPERANDS WHICH TERMINATE THE EFFECT OF "¢U" ARE
: "¢P", "¢S", AND "¢U". )LL 8. ¢COMMAND ¢OPERANDS WHICH TERMINATE THE EFFECT OF
"¢" ARE: "¢P", "¢S", "¢V", AND "¢". )LL 9. ¢COMMAND ¢OPERANDS WHICH TERMINATE CE
NTERING (INITIATED BY "¢M") ARE: "¢M", "¢P", AND "¢S". )LL 10. ¢COMMAND ¢OPERAND
S WHICH TERMINATE THE EFFECT OF "¢F" ARE: "¢F", "¢P", "¢S", AND "¢V". )LL 11. ¢C
OMMAND ¢OPERANDS WHICH MAY BE FOLLOWED BY A NUMERIC QUANTITY ARE: "¢DN", "¢HN",
"¢IN", "¢TN", AND "¢WN". )LL 12. ¢COMMAND ¢OPERANDS WHOSE EFFECT IS TURNED ON OR
 OFF BY ALTERNATE OCCURRENCES OF THE ¢COMMAND ¢OPERAND ARE: "¢F", "¢H", "¢I", "¢
K", "¢M", "¢U", AND "¢". )SU ¢EXAMPLES OF ¢COMMAND ¢WORDS )U )LLLLA
     1. )¢ MEN ARE SLOW )L TO GRASP NEW IDEAS; )¢
)
)L "TO GRASP" BEGINS A NEW COLUMN-LINE. )LLLA
     2. )¢ )LTTTU¢ NOW )U¢ IS THE TIME.
)
)L¢ ¢A NEW LINE IS BEGUN, AND BEGINNING AT THE THIRD TAB POSITION IS PRINTED: )U
¢ NOW )U¢ IS THE TIME. )LLP 3. NOTE THAT ")¢C¢P" (MEANING "BEGIN NEXT TEXT COLUM
N" FOLLOWED BY "START A NEW PARAGRAPH") DOES NOT PRODUCE THE SAME EFFECT AS ")¢P
¢C", WHICH IS EFFECTIVELY THE SAME AS ")¢C". THIS IS BECAUSE THE "¢P" BEGINS A P
ARAGRAPH, BUT THE FOLLOWING "¢C" IMMEDIATELY STARTS A NEW COLUMN. BECAUSE "¢C" E
NDS THE COLUMN-LINE ON WHICH IT OCCURS, THE INDENT (IF ANY) AT THE START OF THE
PARAGRAPH WAS LOST. )LLL¢A
     4. )M * )L *** )L ***** )L ******* )L ***** )L *** )L * )M
)
)¢ ¢THIS PRODUCES: )LLM * )L *** )L ***** )L ******* )L ***** )L *** )L * )MLP 5
. THE TEXT "BLANK ) BLANK" IS VALID, AND IS NOT INTERPRETED AS THE BEGINNING OF
A COMMAND WORD. THUS, )¢ "(¬A+B¬)¬*¬C" )¢ PRODUCES: "(¬A+B¬)¬*¬C", BUT )¢ "(¬A+B
¬)*¬C" )¢ PRODUCES "(¬A+B )* C" AND AN ERROR DIAGNOSTIC (CODE 700) FOR AN UNDEFI
NED ¢COMMAND ¢OPERAND !16THE "*"!17. (¢THE DIAGNOSTIC LISTING AT THE END OF THIS
 MANUAL SHOWS HOW THE ABOVE ERROR WAS DIAGNOSED.) )LLP 6. THE TEXT ")!43¬¢F¢O¢R¢
M¢A¢T,¬)!43" PRODUCES: )¢ "FORMAT," )¢ BUT THE TEXT ")!43¬¢F¢O¢R¢M¢A¢T¬)!43," PR
ODUCES: )¢ "FORMAT¬," )¢ AND A DIAGNOSTIC MESSAGE FOR AN UNDEFINED ¢COMMAND ¢OPE
RAND, THE COMMA. THUS, PUNCTUATION CHARACTERS SUCH AS COMMAS AND PERIODS SHOULD
BE PLACED IMMEDIATELY AFTER THE TEXT WORD THEY WOULD NORMALLY FOLLOW, AND ANY ¢C
OMMAND ¢WORDS SHOULD THEN FOLLOW THE BLANK AFTER THE PUNCTUATION CHARACTER. )LLL
W4A
     7. )¢ )H2 TEXT ... TEXT )H )¢
)
)LH2 ¢THIS TEXT MATERIAL ILLUSTRATES DELAYED COLUMN INDENTATION, PRODUCED BY ¢CO
MMAND ¢OPERAND "¢H". NOTE THAT EITHER ONE OF THE MARGINS, OR BOTH MARGINS (AS IN
 THIS EXAMPLE), CAN BE DRAWN IN, AS THE USER DESIRES. IN THIS EXAMPLE, THE SECON
D PAIR OF COLUMN INDENTATIONS WAS "(5,5)", SO THAT BOTH MARGINS WERE INDENTED 5
SPACES. NOTE ALSO THAT THE FINAL "¢H" COULD HAVE BEEN "¢H2". )HLLLA
     8. )¢ )I3 TEXT ... TEXT )I3 )¢
)
)I3P THIS TEXT MATERIAL ILLUSTRATES IMMEDIATE COLUMN INDENTATION, PRODUCED BY ¢C
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OMMAND ¢OPERAND "¢I". IN THIS EXAMPLE, THE THIRD PAIR OF COLUMN INDENTATIONS WAS
 "(5,0)", SO THAT ONLY THE LEFT MARGIN WAS INDENTED 5 SPACES. THE EXTRA INDENT O
F THE FIRST LINE OCCURRED BECAUSE A PARAGRAPH WAS STARTED BY A "¢P" ¢COMMAND ¢OP
ERAND. )ILLLA
     9. )¢ )W10JJJJJJJJJJ )¢
)
)L ¢A BLOCK OF 10 BLANK COLUMN-LINES IS LEFT IN THE SAME TEXT COLUMN (ASSUMING O
F COURSE THAT THE )¢ "SPACING OF TEXT LINES" )¢ IS 1). THIS IS USEFUL FOR THE LA
TER INSERTION OF A PHOTOGRAPH, FOR EXAMPLE. )S ¢V. )H4U ¢SPECIAL ¢OPERANDS FOR ¢
CAPITALIZATION AND ¢SPECIAL ¢CHARACTERS, AND THE ¢NON-¢TRIVIAL ¢BLANK )HLLP )¢ F
ORMAT )¢ CAN PRODUCE UPPER AND LOWER CASE AND SPECIAL CHARACTERS IN TWO WAYS. IF
 THE TEXT INPUT IS PUNCHED WITH THE ¢HOLLERITH CODES REPRESENTING THE CHARACTERS
 DESIRED (SUCH AS ARE PRODUCED BY A TERMINAL OR BY AN UPPER AND LOWER CASE KEYPU
NCH, FOR EXAMPLE), THE PROPER CHARACTER REPRESENTATIONS ON OUTPUT ARE SUPPLIED D
IRECTLY BY THE HARDWARE OF THE COMPUTER SYSTEM. IF, HOWEVER, AN UPPER AND LOWER
 CASE KEYPUNCH OR TERMINAL IS NOT USED (OR APPROXIMATED BY MULTI-PUNCHING ON A ST
ANDARD KEYPUNCH), THEN UPPER AND LOWER CASE AND SPECIAL CHARACTERS CAN BE PRODUC
ED USING THE ¢SPECIAL ¢OPERANDS. )P THERE ARE TWO ¢SPECIAL ¢OPERANDS FOR USE WIT
H STANDARD )¢ IBM )¢ 029 AND 026 TYPE KEYPUNCHES. "¢" IS USED FOR CAPITALIZATION
 AND NUMERIC SUPERSCRIPTS, AND "!" ¬IS USED TO PRODUCE SPECIAL CHARACTERS. BOTH
 ¢SPECIAL ¢OPERANDS ARE VALID IN "AS-IS" TEXT MODE. IT IS IMPORTANT TO REMEMBER T
HAT NEITHER OF THE ¢SPECIAL ¢OPERANDS NEEDS TO BE PRECEDED BY THE ")" ESCAPE CHA
RACTER. )LLLLW4U THE "¢" ¢SPECIAL ¢OPERAND: )ULP ¢A LETTER PRECEDED IMMEDIATELY
 BY "¢" IS PRINTED IN UPPER CASE, A NUMBER SO PRECEDED IS PRINTED IN SUPERSCRIPT
 FORM, AND ANY OTHER SYMBOL SO PRECEDED IS PRINTED PRECEDED BY THE GRAPHIC "¢". I
F ONE OF THE )¢ "SPECIAL" )¢ CONTROL CARDS IS IN EFFECT THE TRANSLATION OF A NUM
BER TO A SUPERSCRIPT IS NOT MADE, UNLESS ONLY THE )¢ "SPECIAL KEYPUNCH IS A 2741
" )¢ HAS APPEARED. THE "¢" ¢SPECIAL ¢OPERAND MAY BE PRECEDED BY ANY CHARACTER. T
HE "¢" CHARACTER MUST BE MULTI-PUNCHED ON AN )¢ IBM )¢ 026 TYPE KEYPUNCH. (¢NOTE
 THAT THE "¢" )U ¢COMMAND )U ¢OPERAND CAUSES ALL FOLLOWING LETTERS TO BE CAPITAL
IZED, WHEREAS THE "¢" )U ¢SPECIAL )U ¢OPERAND CAUSES ONLY THE SINGLE, IMMEDIATEL
Y FOLLOWING, LETTER TO BE CAPITALIZED. REFER BACK TO THE SAMPLE INPUT IN ¢SECTIO
N ¢I¢I FOR AN EXAMPLE.) )LLLW4U ¢THE "!" ¢SPECIAL ¢OPERAND )ULP ¢A SPECIAL CHARA
CTER IS DEFINED AS ONE WHICH IS NEITHER A LETTER NOR A NUMBER (NORMAL OR SUPERSC
RIPT) NOR ONE OF THE FOLLOWING: *$.-,/. A SPECIAL CHARACTER IS PRODUCED WHENEVER
 THE STRING OF CHARACTERS "!NN" IS USED, WHERE NN IS ANY NUMBER FROM 10 TO 51: F
OR EXAMPLE, !5128 PRODUCES "!28". IF NN IS NOT IN THE RANGE FROM 10 TO 51, THEN
 "!NN" IS PRINTED. )V
TABS ARE SET AT 20 25 30 36
NULL CHARACTER SWITCH SET TO 2 (USE NONTRIVIALS FOR CENTERING)
GO
)P THE CORRESPONDENCE BETWEEN THE VALUES FOR NN, THE ¢T¢N ¢PRINT ¢TRAIN GRAPHICS
, THE )¢ EBCDIC )¢ HEXADECIMAL CHARACTER CODES, AND THE PUNCHED CARD CODES IS SH
OWN BELOW. )LLL )T NN )T ¢T¢N )T HEX )T ¢CARD ¢CODE )LL¢ )T 10 )T !10 )T 8D )T 1
2-0-8-5 )L )T 11 )T !11 )T 9D )T 12-11-8-5 )L )T 12 )T !12 )T 8E )T 12-0-8-6 )L
)T 13 )T !13 )T A0 )T 11-0-8-1 )L )T 14 )T !14 )T 8B )T 12-0-8-3 )L )T 15 )T !15
 )T 9B )T 12-11-8-3 )L )T 16 )T !16 )T AD )T 11-0-8-5 )L )T 17 )T !17 )T BD )T 1
2-11-0-8-5 )L )T 18 )T !18 )T 8C )T 12-0-8-4 )L )T 19 )T !19 )T AE )T 11-0-8-6 )
L )T 20 )T !20 )T 9E )T 12-11-8-6 )L )T 21 )T !21 )T BE )T 12-11-0-8-6 )L )T 22
)T !22 )T AB )T 11-0-8-3 )L )T 23 )T !23 )T BB )T 12-11-0-8-3 )L )T 24 )T !24 )T
 AC )T 11-0-8-4 )L )T 25 )T !25 )T BC )T 12-11-0-8-4 )L )T 26 )T !26 )T 8F )T 12
-0-8-7 )L )T 27 )T !27 )T BF )T 12-11-0-8-7 )L )T 28 )T !28 )T 9C )T 12-11-8-4 )
L )T 29 )T !29 )T 9F )T 12-11-8-7 )L )T 30 )T !30 )T AF )T 11-0-8-7 )L )T 31 )T
!31 )T A1 )T 11-0-1 )L )T 32 )T !32 )T 50 )T 12 )L )T 33 )T !33 )T 4F )T 12-8-7
)L )T 34 )T !34 )T 5F )T 11-8-7 )L )T 35 )T !35 )T 4C )T 12-8-4 )L )T 36 )T !36
)T 7E )T 8-6 )L )T 37 )T !37 )T 6E )T 0-8-6 )L )T 38 )T !38 )T 4E )T 12-8-6 )L )
T 39 )T !39 )T 4D )T 12-8-5 )L )T 40 )T !40 )T 5D )T 11-8-5 )L )T 41 )T !41 )T 7
F )T 8-7 )L )T 42 )T !42 )T 7D )T 8-5 )L )T 43 )T !43 )T 4A )T 12-8-2 )L )T 44 )
T !44 )T 7B )T 8-3 )L )T 45 )T !45 )T 6C )T 0-8-4 )L )T 46 )T !46 )T 7C )T 8-4 )
L )T 47 )T !47 )T 6D )T 0-8-5 )L )T 48 )T !48 )T 5E )T 11-8-6 )L )T 49 )T !49 )T
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)T 7A)T 8-2)L)T 50)T !50)T 6F)T 0-8-7)L)T 51)T !51)T 5A)T 11-8-2)SP ¢IT SHOULD BE NOTED THAT THE SPECIAL CHARACTERS FROM NN = 32 THROUGH NN = 51 CAN BE PUNCHED DIRECTLY ON THE STANDARD)¢ IBM)¢ 029 ¢KEYPUNCH, THAT THE "!"¬ CHARACTER ITSELF MUST BE MULTI-PUNCHED ON AN)¢ IBM)¢ 026 TYPE KEYPUNCH, AND THAT !5143 IS NOT EQUIVALENT TO EITHER THE "¢" ¢SPECIAL ¢OPERAND OR THE "¢" ¢COMMAND ¢OPERAND.)LLLW4U ¢THE ¢NON-¢TRIVIAL ¢BLANK)ULP THE CHARACTER PRODUCED BY PUNCHES IN THE 0, 8, AND 2 ROWS OF A SINGLE CARD COLUMN (WHICH HAS)¢ EBCDIC)¢ REPRESENTATION ¢E0) IS REPLACED BY A "NON-TRIVIAL" BLANK; I.E., ONE WHICH IS NEVER ELIMINATED BY THE PROGRAM. THE ¢I¢BM 029 ¢KEYPUNCH HAS A KEY WHICH PROVIDES THIS CONFIGURATION OF PUNCHES DIRECTLY. THE NON-TRIVIAL BLANK IS TREATED IN ALL RESPECTS AS IF IT WERE A NON-BLANK CHARACTER EXCEPT THAT IT MAY OR MAY NOT BE THE FIRST OR LAST CHARACTER UNDERLINED, AND IT MAY OR MAY NOT BE CONSIDERED FOR CENTERING PURPOSES, BOTH DEPENDING ON THE)¢ "NULL CHARACTER SWITCH")¢ SETTING.)P WHEN USING AN INPUT DEVICE SUCH AS A 2741 TERMINAL WHICH HAS NO PROVISION FOR ENTERING THE NON-TRIVIAL BLANK, A SPECIAL TECHNIQUE IS AVAILABLE, THROUGH THE USE OF THE)¢ "NONTRIVIAL BLANK")¢ CONTROL CARD. FOR EXAMPLE, IF THE INPUT TEXT CONTAINS NO "&" CHARACTERS, THEN THE CONTROL CARD)¢LLM NONTRIVIAL BLANK REPRESENTED BY 32 (&))¢LLM WOULD CAUSE SUBSEQUENT APPEARANCES OF &'S TO BE CHANGED TO NON-TRIVIAL BLANKS, UNTIL THE NEXT)¢ "NONTRIVIAL BLANK")¢ CONTROL CARD. THUS, IF THE)¢ "NULL CHARACTER SWITCH")¢ IS SET TO 1, THE INPUT TEXT)¢LLM !40LLM <----|&&&&& !40L &&&&&|----> !40LLM)¢LLM WOULD CAUSE THE PRINTED RESULT TO APPEAR AS SHOWN BELOW.)LLM <----|)L ¬¬¬¬¬|---->)LLM ¢IF THE)¢ "NULL CHARACTER SWITCH")¢ HAD BEEN SET TO 2, THEN THE RESULT WOULD HAVE APPEARED AS FOLLOWS:)LLM <----|¬¬¬¬¬)L ¬¬¬¬¬|---->)LLM SINCE THE NON-TRIVIAL BLANKS AT THE END OF THE FIRST GROUP OF CHARACTERS WOULD NOT BE IGNORED FOR CENTERING.)SU ¢EXAMPLES OF THE ¢USAGE OF ¢SPECIAL ¢OPERANDS)ULP FOR THESE EXAMPLES, IT IS ASSUMED THAT)¢ "SPECIAL KEYPUNCH")¢ AND)¢ "SPECIAL PRINT TRAIN")¢ ARE NOT IN EFFECT. THUS THE INPUT IS IN UPPER CASE, AND THE RESULTS WILL BE IN LOWER CASE UNLESS A ¢COMMAND ¢OPERAND OR A ¢SPECIAL ¢OPERAND FORCES CAPITALIZATION.)LLLA

1. !431 PRODUCES: ¢1

2. !43¢P!43¢I*¢R!432 PRODUCES: ¢P¢I*R¢2

3. !40!43)¢ PI*R2)¢ !40!43 PRODUCES:)¢ PI*R2)¢

4. !40!43 ¢P¢I*¢R!432 !40!43 PRODUCES:)¢ PI*R¢2)¢

5. !40¢F)¢ TEXT1 ... TEXTN)¢ !40¢F PRODUCES:)F TEXT1 ... TEXTN)F

6. !40¢F)¢ TEXT!431 ... T!43EXTN)¢ !40¢F PRODUCES:)F TEXT¢1 ... T¢EXTN)F

7. ¢D!43¢X!432/¢D!432!43¢Y PRODUCES: D¢X¢2/D¢2¢Y

8. !43¢E!5110!432!5112!433!5111 PRODUCES: ¢E!10¢2!12¢3!11

9. 6!51¬PRODUCES: 6!

10. 6!5151 PRODUCES: 6!51

11.)¢ !43I WISH !43I HAD 53!43!51)¢ ¢¬PRODUCES: ¢I WISH ¢I HAD 53¢!

12.)¢ !43ONCE !43I HAD 25!5143!5148 !43NOW IT!5142S GONE.)¢
PRODUCES: ¢ONCE ¢I HAD 25!43!48 ¢NOW IT!42S GONE.

13. !5152 PRODUCES: !52

14. !516 PRODUCES: !6

15. !5124!5127!5125 !40¢L |!43¢X| !40¢L !5122!5127!5123 PRODUCES:
!24!27!25

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        !¢X!
        !22!27!23

16.  !5114X!X!51210!5115 PRODUCES: !14X!X!210!15
)
)S¢ VI. )¢U ¢THE ¢EDITOR ¢FACILITY )ULLP ¢THE ¢EDITOR FACILITY CAN BE USED TO CH
ANGE, OVERRIDE, COPY, COMBINE, LIST, AND PUNCH CARD IMAGE DATA SETS; IT CAN ALSO
 LOCATE WORDS, PHRASES, AND CHARACTER STRINGS WITHIN THE TEXT. THE CARD IMAGE DA
TASETS READ AND WRITTEN BY THE ¢EDITOR WILL BE CALLED "TAPE DATASETS"; THESE WIL
L USUALLY HAVE BEEN CREATED INITIALLY BY USE OF THE )¢ "CREATE A TAPE", "LIST TH
E INPUT DATASET", )¢ OR )¢ "PUNCH THE INPUT DATASET" )¢ CONTROL CARDS. THE TAPE
DATASETS MAY CONTAIN PORTIONS OF JOBS, WHOLE JOBS, OR MULTIPLE JOBS. WE WILL REF
ER TO THE INPUT DATASET TO BE EDITED AS THE "OLD MASTER", AND TO THE RESULTING O
UTPUT DATASET AS THE "NEW MASTER". THE NEW MASTER IS CONSTRUCTED WITH ALL UNNEED
ED BLANKS REMOVED, IN THE SAME "CONDENSED" FORM AS A DATASET CREATED BY THE )¢ "
CREATE A TAPE" )¢ CONTROL CARD. )P THE FUNCTIONS PROVIDED BY THE ¢EDITOR ARE REQ
UESTED BY USING A )U SINGLE )U ¢EDITOR CONTROL CARD GROUP, WHICH MUST BE THE FIR
ST AND ONLY CONTROL CARD GROUP OF THE JOB, AND WHICH MUST BE READ FROM THE ¢SYST
EM ¢INPUT DATASET. (¢SEE ¢SECTION ¢V¢I¢I.) THIS ¢EDITOR CONTROL CARD GROUP MUST
BEGIN WITH THE )¢ "EDITOR" )¢ OR )¢ "TAPE INPUT" )¢ CONTROL CARD, WHICH IS THEN
FOLLOWED BY THE DESIRED ¢EDITOR CONTROL CARDS AND MODIFICATIONS TO THE OLD MASTE
R (IF ANY), AND IT MUST END WITH THE "¢G¢O" CONTROL CARD. )¢ FORMAT )¢ DETERMINE
S FROM THE PRESENCE OF THE )¢ "EDITOR" )¢ OR )¢ "TAPE INPUT" )¢ CONTROL CARD THA
T AN EDIT PHASE IS TO PRECEDE THE DOCUMENT PHASE OF THE RUN. IF THE USER REQUEST
S AN EDIT PHASE, THEN THE SUBSEQUENT DOCUMENT PHASE WILL USE THE RESULT OF THE E
DIT PHASE AS ITS INPUT; IN ADDITION, THERE CAN BE )U NO )U FURTHER DOCUMENT OR E
DIT PHASES. WHEN THE END OF THE ¢EDITOR CONTROL CARD GROUP IS REACHED, NO FURTHE
R REFERENCE WILL BE MADE TO THE ¢SYSTEM ¢INPUT DATASET. )P AN ERROR DETECTED BY
THE ¢EDITOR MEANS THAT THE NEWLY EDITED DOCUMENT WILL NOT BE PRODUCED; HOWEVER,
THE EDIT CONTINUES IN ORDER TO DETECT AS MANY ERRORS AS POSSIBLE. IT IS CLEAR TH
AT USER ERRORS MAKE IT IMPOSSIBLE TO KNOW THE INTENTION OF THE USER, AND )¢ FORM
AT )¢ THEREFORE MAKES ASSUMPTIONS WHEREVER NECESSARY SO THAT IT CAN CONTINUE THE
 EDIT. THUS, ERRORS DETECTED AFTER THE FIRST ERROR MAY BE DUE TO THE ASSUMPTIONS
 MADE BY THE PROGRAM, AND NOT DUE TO THE USER. WHETHER OR NOT ERRORS OCCURRED DU
RING THE EDIT, )¢ FORMAT )¢ ALWAYS GIVES A LISTING OF ALL THE CONTROL CARD GROUP
S USED, AND A SET OF DIAGNOSTICS IF ANY WERE GENERATED. )P AT THE CONCLUSION OF
AN ERROR-FREE EDIT, THE DOCUMENT IS PRODUCED FROM THE NEW MASTER, UNLESS OTHERWI
SE SPECIFIED (SEE THE )¢ "$NO DOCUMENT" )¢ ¢EDITOR CONTROL CARD), AND THE ¢EDITO
R CONTROL CARD GROUP WILL APPEAR FIRST WHEN THE CONTROL CARD GROUPS ARE PRINTED
FOLLOWING THE DOCUMENT. IN THE UPPER FAR RIGHT CORNER OF EACH PAGE OF THE DOCUME
NT, )¢ FORMAT )¢ WILL PRINT THE FIRST AND LAST CARD IMAGE NUMBERS FROM THE NEW M
ASTER THAT WERE USED IN PRODUCING THAT PAGE. A LISTING OF THE LATEST TAPE INPUT
DATASET (AS DESCRIBED IN THE DISCUSSION OF THE )¢ "CREATE A TAPE" )¢ CONTROL CAR
D IN ¢SECTION ¢I¢I¢I) IS PRODUCED AFTER A SUCCESSFUL EDIT IF THE ¢EDITOR CONTROL
 CARD GROUP IS BEGUN BY THE )¢ "EDITOR" )¢ CONTROL CARD. )P THE ¢EDITOR CONTROL
CARDS ARE COMPLETELY FREE-FORM, AS DESCRIBED AT THE BEGINNING OF ¢SECTION ¢I¢I¢I
. ALL ¢EDITOR CONTROL CARDS (EXCEPT "¢G¢O") BEGIN WITH A "$", WHICH DISTINGUISHE
S THEM FROM ORDINARY CONTROL CARDS. DURING THE EDIT PHASE, ORDINARY CONTROL CARD
S ARE SIMPLY DATA TO BE EDITED FROM THE OLD MASTER, OR ADDED TO THE NEW MASTER.
THUS, THE )¢ "EDITOR" )¢ AND )¢ "TAPE INPUT" )¢ CONTROL CARDS ARE )U ORDINARY )U
 CONTROL CARDS; THEY SIMPLY INITIATE THE EDIT PHASE. DUE TO A MACHINE-DEPENDENT
INTERNAL STORAGE LIMITATION, NO ¢EDITOR CONTROL CARD OPERAND MAY EXCEED 32,767.
THE ¢EDITOR CONTROL CARDS ARE DESCRIBED IN THE FOLLOWING PARAGRAPHS, AND SOME EX
AMPLES OF ¢EDITOR CONTROL CARD GROUPS WILL BE GIVEN AT THE END OF THIS SECTION.
)LLLLW4U ¢EDITING THE ¢OLD ¢MASTER )ULLP THREE ¢EDITOR CONTROL CARDS ARE USER TO
 MODIFY THE TAPE INPUT DATASET (THE OLD MASTER) AND PRODUCE A NEW TAPE INPUT DAT
ASET (THE NEW MASTER): THEY ARE )¢ "$INSERT", "$DELETE", )¢ AND )¢ "$END CHANGES
". )¢ BEFORE DESCRIBING THE FUNCTION OF EACH CONTROL CARD IN DETAIL, WE WILL GIV
E A BRIEF DESCRIPTION OF THE EDITING PROCESS ITSELF. )P TO PERFORM THESE FUNCTIO
NS, )¢ FORMAT )¢ FIRST READS AN ¢EDITOR CONTROL CARD FROM THE ¢SYSTEM ¢INPUT DAT
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ASET TO DETERMINE THE EDITING FUNCTION DESIRED. MATERIAL IS THEN COPIED FROM THE OLD MASTER TO THE NEW MASTER UNTIL THE ¢EDITOR FINDS THE POSITION ON THE OLD MASTER WHERE THE INSERTION OR DELETION IS TO OCCUR; THIS POSITION IS CALLED THE "EDIT POINT". AFTER DELETING MATERIAL FROM THE OLD MASTER (IF REQUESTED),)¢ FORMAT)¢ INSERTS NEW MATERIAL (IF PROVIDED) INTO THE NEW MASTER, UNTIL IT ENCOUNTERS THE NEXT ¢EDITOR CONTROL CARD.)P IN THIS WAY,)¢ FORMAT)¢ OBEYS EACH OF THE ¢EDITOR CONTROL CARDS IN TURN, READING CARD IMAGES FROM THE OLD MASTER AND WRITING CARD IMAGES ON THE NEW MASTER. SINCE THE OLD MASTER CONTAINS DATA WHICH CAN BE USED IN THE DOCUMENT PHASE, IT CAN BE READ BY THE ¢EDITOR IN TWO WAYS: NORMAL TEXT, WHICH RUNS FREELY FROM CARD IMAGE TO CARD IMAGE, AND SINGLE CARD IMAGES (ORDINARY CONTROL CARDS, AND "AS-IS" TEXT CARDS). THUS, WHEREAS THE DOCUMENT PHASE READS ITS INPUT IN THREE MODES (ORDINARY TEXT, AS-IS TEXT, AND CONTROL CARD), THE EDIT PHASE READS THE OLD MASTER AND WRITES THE NEW MASTER IN ONLY)U TWO)U MODES. THESE WILL BE CALLED)U WORD)U MODE (CONTAINING THE TEXT OF TITLES AND FOOTERS, AND ORDINARY TEXT), AND)U CARD)U MODE (CONTAINING AS-IS TEXT AND ORDINARY CONTROL CARDS). DIAGNOSTIC 806 OR 814 (SEE ¢SECTION ¢X¢I¢I) IS ISSUED IF A MODE ERROR OCCURS.)P THE OLD MASTER (PREFERABLY FILE-PROTECTED) IS READ FROM DATASET REFERENCE NUMBER 2, AND THE NEW MASTER IS WRITTEN ON DATASET REFERENCE NUMBER 4. IT IS IMPORTANT TO REMEMBER THAT THE EDIT PHASE, UNLIKE THE DOCUMENT PHASE, READS FROM)U TWO)U SOURCES: FROM THE ¢SYSTEM ¢INPUT DATASET, WHICH CONTAINS ¢EDITOR CONTROL CARDS AND CHANGES TO THE OLD MASTER; AND FROM THE OLD MASTER, WHICH IS TO BE EDITED ACCORDING TO THE INSTRUCTIONS IN THE ¢EDITOR CONTROL CARD GROUP.)P WE WILL NOW DESCRIBE THE THREE ¢EDITOR CONTROL CARDS USED TO PERFORM THE EDITING FUNCTIONS.)LLL¢W4 $INSERT BEFORE CARD IMAGE)¢U A)¢U WORD)¢U B)UP ¢THE CONTENTS OF THE CARDS (IF ANY) BETWEEN THIS ¢EDITOR CONTROL CARD AND THE NEXT ¢EDITOR CONTROL CARD ARE INSERTED INTO THE NEW MASTER AT THE SPECIFIED EDIT POINT, WHICH IS DETERMINED AS FOLLOWS:)LLW2H4 1.¬¢IF THE INSERTION REFERS TO TEXT OR TITLES (THE OLD MASTER IS BEING READ IN WORD MODE), THEN THE EDIT POINT IS JUST)U BEFORE)U WORD)U B)U ON CARD IMAGE)U A)U OF THE OLD MASTER (WHERE B IS A COUNT OF ONLY THOSE WORDS)U BEGUN)U ON CARD IMAGE A, AND MUST BE OTHER THAN BLANK OR ZERO).)H4LLW2H4 2.¬¢IF THE INSERTION REFERS TO "AS-IS" TEXT OR CONTROL CARDS (THE OLD MASTER IS BEING READ IN CARD MODE), THEN THE EDIT POINT IS JUST BEFORE CARD IMAGE)U A,)U AND)U B)U MUST BE BLANK OR ZERO. (¢IN CARD MODE, INSERTIONS ARE MADE ONE CARD IMAGE AT A TIME, AND DO NOT DEPEND ON THE WORDS ON THE CARD.))H4LL ¢THE VALUES OF)U A)U (CARD IMAGE NUMBERS) AND)U B)U (NUMBERS OF TEXT AND TITLE WORDS BEGUN ON THAT CARD) TO BE USED WITH THE OLD MASTER ARE FOUND IN THE LISTING PRODUCED WHEN THE OLD MASTER WAS CREATED OR LAST EDITED.)P THE CARDS CONTAINING THE MATERIAL TO BE INSERTED SHOULD BE PREPARED IN THE SAME WAY AS ORDINARY TEXT, TITLE, "AS IS", OR CONTROL CARDS, AS THOUGH THE)¢ "CARD FIELD THRU 80")¢ AND)¢ "029 KEYPUNCH")¢ CONTROL CARDS ARE IN EFFECT. THESE TWO CONTROL CARDS ALSO PERTAIN TO THE NEW MASTER, BECAUSE THE)¢ "026 KEYPUNCH", "029 KEYPUNCH",)¢ AND)¢ "CARD FIELD")¢ CONTROL CARDS WILL BE IGNORED AS INSERTIONS. THE)¢ "CONTROL CARD ENDS IN")¢ CONTROL CARD MAY BE INSERTED, AND IT WILL TAKE EFFECT DURING THE EDIT.)LLL¢W4 $DELETE CARD IMAGE)¢U A)¢U WORD)¢U B)UL OR)L)¢ $DELETE CARD IMAGE)¢U A)¢U WORD)¢U B)¢U THRU CARD IMAGE)¢U C)¢U WORD)¢U D)UP THE CONTENTS OF THE CARDS (IF ANY) BETWEEN THIS ¢EDITOR CONTROL CARD AND THE NEXT ¢EDITOR CONTROL CARD ARE INSERTED INTO THE NEW MASTER AT THE EDIT POINT. THEN, THE MATERIAL IN THE OLD MASTER FROM A,B THROUGH AND INCLUDING C, D (IF SPECIFIED) IS SKIPPED OVER, AND IT WILL NOT APPEAR IN THE NEW MASTER. THE DESCRIPTION OF THE)¢ $INSERT)¢ CARD APPLIES, WITH THE REMARKS CONCERNING THE VALUE OF B ALSO APPLYING TO THE VALUE OF D. IF IT IS DESIRED TO DELETE FROM A,B TO THE END OF THE OLD MASTER, THE VALUE 32767 MAY BE GIVEN TO C TO REDUCE RUN TIME (NO OPERAND IS REQUIRED FOR D).)P WITH A SINGLE EXCEPTION, EACH)¢ $INSERT)¢ AND)¢ $DELETE)¢ ¢EDITOR CONTROL CARD MUST REFER TO AN EDIT POINT IN THE OLD MASTER BEYOND THE LAST POINT REFERENCED. THE ONE EXCEPTION TO THIS RULE IS THAT MULTIPLE SUCCESSIVE)¢ $INSERT)¢ REFERENCES TO THE)U SAME)U A AND B ARE ALLOWED; THE INSERTIONS WILL APPEAR IN THE SAME ORDER IN THE NEW MASTER.)P NO)¢ $INSERT)¢ OR)¢ $DELETE)¢ CONTROL CARD CAN BE ALLOWED FOLLOWING A)¢ $DUPLICATE)¢ OR)¢ $END CHANGES)¢ CONTROL CARD, BECAUSE EACH OF THESE PLACES THE EDIT POINT AT THE END OF THE OLD MASTER, BEYOND WHICH THERE IS NO LEGITIMATE POINT. NO)¢

$INSERT)¢ OR)¢ $DELETE)¢ CONTROL CARD IS ALLOWED IN THE SAME ¢EDITOR CONTROL CARD GROUP WITH)¢ $MERGE)¢ OR)¢ $JOIN)¢ CONTROL CARDS; THAT IS, CHANGES AND MERGES MUST BE ACCOMPLISHED IN SEPARATE RUNS.)LLL¢W4 $END CHANGES)¢P ¢THIS CONTROL CARD IS REQUIRED FOLLOWING THE LAST)¢ $INSERT)¢ OR)¢ $DELETE)¢ CONTROL CARD, UNLESS THE END OF THE OLD MASTER HAS BEEN REACHED. IT COMPLETES THE NEW MASTER BY ADDING TO IT THE UNREFERENCED LAST PORTION OF THE OLD MASTER. THIS CONTROL CARD IS IGNORED WHEN NOT REQUIRED (THAT IS, WHEN THE END OF THE OLD MASTER HAS BEEN REACHED).)LLLL¢W4UF COMBINING DATA SETS)UFLLLP TO COMBINE TAPE INPUT DATASETS INTO A SINGLE NEW TAPE INPUT DATASET (THE "NEW MASTER"):)LLL¢W4 $MERGE TAPE INPUT DATASETS ON)¢U X1,...,X8)UP ¢THE NEW MASTER IS PRODUCED AT DATASET REFERENCE NUMBER 2 AND IS AN UNCHANGED CONCATENATION OF THE TAPE INPUT DATASETS AT THE DATASET REFERENCE NUMBERS GIVEN IN THE OPERAND FIELD, IN THE ORDER IN WHICH THEY ARE GIVEN. UP TO EIGHT DATASET REFERENCE NUMBERS MAY BE SPECIFIED IN ANY ORDER, AND ANY MAY BE SPECIFIED MORE THAN ONCE FOR MULTIPLE COPIES OF PARTICULAR TAPE INPUT DATASETS. THE VALID DATASET REFERENCE NUMBERS ARE 9 AND HIGHER, AND 4. THE USER MUST DETERMINE THAT ALL DATASET REFERENCE NUMBERS USED HAVE BEEN GENERATED INTO THE OPERATING SYSTEM BEING USED.)P AS MANY)¢ $MERGE)¢ AND)¢ $JOIN)¢ CONTROL CARDS AS DESIRED MAY BE USED. NO)¢ $MERGE)¢ OR)¢ $JOIN)¢ CONTROL CARD IS ALLOWED IN THE SAME ¢EDITOR CONTROL CARD GROUP WITH)¢ $INSERT, $DELETE)¢ OR)¢ $DUPLICATE)¢ CONTROL CARDS; THAT IS, MERGES MUST BE ACCOMPLISHED IN A SEPARATE RUN FROM CHANGES AND DUPLICATION.)P IT IS GOOD PRACTICE THAT THE TAPE INPUT DATASETS BE FILE-PROTECTED.)LLL¢W4 $JOIN TAPE INPUT DATASETS ON)¢U X1,...,X8)UP ¢THIS CONTROL CARD PRODUCES A RESULTANT NEW MASTER LIKE THE ONE PRODUCED BY THE)¢ $MERGE)¢ CONTROL CARD, WITH ONE DIFFERENCE: ALL DOCUMENT-ENDING "¢E" ¢COMMAND ¢OPERANDS ENCOUNTERED ON THE TAPE INPUT DATASETS REFERENCED ARE CHANGED TO "¢V" ¢COMMAND ¢OPERANDS, EXCEPT FOR THOSE ON THE LAST DATASET REFERENCED. THE EFFECT OF THIS IS TO COMBINE THE INPUT FOR MANY JOBS INTO INPUT FOR ONE NEW JOB.)P THE REMAINDER OF THE DESCRIPTION OF THE)¢ $MERGE)¢ CONTROL CARD APPLIES TO THIS CONTROL CARD.)LLLLW6U ¢OTHER ¢EDITOR ¢CONTROL ¢CARDS)ULLL¢ $DUPLICATE OLD MASTER)¢P ¢THE OLD MASTER IS COPIED FROM THE POSITION AT WHICH THE LAST)¢ $INSERT)¢ OR)¢ $DELETE)¢ CONTROL CARD HAS LEFT IT; OR, IF NO POSITION WAS SPECIFIED, FROM THE BEGINNING. THE OLD MASTER (PREFERABLY FILE-PROTECTED) IS MOUNTED AT DATASET REFERENCE NUMBER 2, AND THE COPY IS WRITTEN AT DATASET REFERENCE NUMBER 4. THIS CONTROL CARD MAY BE USED TO COMPLETE A NEW MASTER BEGUN BY)¢ $INSERT)¢ AND)¢ $DELETE)¢ CONTROL CARDS.)P THE)¢ $DUPLICATE)¢ CONTROL CARD IS NOT ALLOWED IN THE SAME ¢EDITOR CONTROL CARD GROUP WITH)¢ $MERGE)¢ OR)¢ $JOIN)¢ CONTROL CARDS.)LLL¢W4 $NO DOCUMENT)¢P ¢THIS CONTROL CARD PREVENTS PRODUCTION OF THE EDITED DOCUMENT, WHICH OTHERWISE FOLLOWS A SUCCESSFUL EDIT RUN. ANY LISTING, PUNCHING, OVERRIDING, LOCATING, AND DICTIONARY FUNCTIONS THAT MAY HAVE BEEN REQUESTED CONCERNING THE LATEST TAPE INPUT DATASET ARE UNAFFECTED.)LLL¢W4 $OVERRIDE FIRST CONTROL CARD GROUP)¢P THE FOLLOWING CARDS (UP TO THE NEXT ¢EDIT OR OR)¢ "GO")¢ CONTROL CARD) ARE CONTROL CARDS WHICH WILL OVERRIDE THE FIRST CONTROL CARD GROUP ON THE TAPE INPUT DATASET WHEN IT IS USED TO PRODUCE THE DOCUMENT. NO)¢ "TITLE")¢ OR)¢ "FOOTER")¢ CONTROL CARD MAY OVERRIDE. NO PHYSICAL CHANGE IS MADE TO EITHER MASTER.)¢ FORMAT)¢ SAVES THE OVERRIDING CONTROL CARD GROUP, AND USES IT AS PART OF THE FIRST GROUP READ FROM THE JUST-COMPLETED NEW MASTER AT THE START OF THE DOCUMENT PHASE. THE OVERRIDING CONTROL CARDS WILL BE INSERTED JUST BEFORE THE FIRST)¢ "TITLE", "FOOTER",)¢ OR "¢G¢O" CONTROL CARD IN THE OVERRIDDEN GROUP.)LLL¢W4 $PUNCH)¢P ¢AT THE CONCLUSION OF THE SUCCESSFUL EDIT RUN AND AFTER THE EDITED DOCUMENT IS PRODUCED OR BYPASSED, THIS CONTROL CARD RESULTS IN THE LATEST TAPE INPUT DATASET BEING COPIED ONTO THE ¢SYSTEM ¢PUNCH DATASET.)LLL¢W4 $LIST)¢P ¢THIS CONTROL CARD FORCES A LISTING OF THE NEW MASTER (IF ANY) AT THE CONCLUSION OF AN EDIT RUN, SUCCESSFUL OR NOT. FOLLOWING AN UNSUCCESSFUL EDIT, THE LISTING IS IN UPPER CASE. IN THE LISTING, THE ¢COMMAND ¢OPERANDS THAT APPEAR ON EACH CARD IMAGE ARE REITERATED ALONGSIDE THE CARD IMAGES, IN THE RIGHT-HAND PORTION OF THE PAGE. THIS ALLOWS ONE TO FIND ¢COMMAND ¢WORDS RAPIDLY, AND TO LOCATE DESIRED AREAS OF THE INPUT TEXT. THOSE SYMBOLS FOR WHICH NO GRAPHICS ARE EXPECTED ARE PRINTED AS ASTERISKS IN THE LISTING.)LLL¢W4 $OMIT LISTING OF NEW MASTER)¢P THE PRESENCE OF THIS CONTROL CARD IN THE GROUP OF ¢EDITOR CONTROL CARDS WILL SUPPRESS THE LISTING OF THE NEW MASTER FOLLOWING A SUCCESSFUL E

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DIT. THE DEFAULT ACTION IS TO PRODUCE THE LISTING. )P THE PRODUCTION OF A LISTIN
G DEPENDS ON A NUMBER OF FACTORS. IF THE ¢EDITOR CONTROL CARD GROUP WAS BEGUN WI
TH THE )¢ EDITOR )¢ CONTROL CARD, THEN A LISTING WILL BE PRODUCED ONLY IF THE ED
IT WAS SUCCESSFUL (IN THE ABSENCE OF A )¢ $LIST )¢ ¢EDITOR CONTROL CARD). IF THE
 ¢EDITOR CONTROL CARD GROUP WAS BEGUN WITH THE )¢ TAPE INPUT )¢ CONTROL CARD, TH
EN A LISTING IS PROVIDED ONLY IF THE $¢L¢I¢S¢T ¢EDITOR CONTROL CARD IS INCLUDED
 IN THE ¢EDITOR CONTROL CARD GROUP. THE )¢ $OMIT LISTING )¢ ¢EDITOR CONTROL CARD
ALWAYS DELETES THE LISTING. )P )¢ FORMAT )¢ WILL USUALLY DIAGNOSE EDITING ERRORS
 SO THAT THE CAUSE OF THE ERROR CAN BE IDENTIFIED READILY. IF ERRORS ARE EXPECTE
D, IT IS SOMETIMES HELPFUL TO INCLUDE THE )¢ $LIST )¢ ¢EDITOR CONTROL CARD IN TH
E ¢EDITOR CONTROL CARD GROUP; THE LISTING CAN THEN BE SCANNED TO SEE WHAT ACTION
S WERE TAKEN BY )¢ FORMAT )¢ IN HANDLING THE ERRORS. )LLL¢W4 $LOCATE THE FOLLOWI
NG WORDS/PHRASES/STRINGS )¢P THIS FACILITY IS INTENDED PRIMARILY TO ASSIST IN TH
E TASK OF INDEX PRODUCTION; SEE THE )¢ "DICTIONARY" )¢ CONTROL CARD ALSO. THE FO
LLOWING CARDS (UP TO THE NEXT ¢EDITOR OR "¢G¢O" CONTROL CARD) CONTAIN ARGUMENTS
 TO BE LOCATED (BY CARD IMAGE NUMBER) IN THE LATEST INPUT STREAM, ACCORDING TO TH
E FOLLOWING RULES: )I4LLW1H3 !30¬ONE SEARCH ARGUMENT PER CARD )HLH3 !30¬NON-ALPH
AMERICS NOT B+-/*$ (B = BLANK) ARE IGNORED BOTH IN SEARCH ARGUMENTS AND IN THE T
EXT STREAM )HLH3 !30¬BLANKS ARE WORD DELIMITERS ONLY, BOTH IN SEARCH ARGUMENTS A
ND IN THE TEXT STREAM )HLH3 !30¬A FINAL NON-BLANK CHARACTER OF "+" IN A SEARCH A
RGUMENT MEANS THAT ALL STRINGS CONSISTING OF THE PRECEDING CHARACTERS ARE TO BE
 LOCATED )HLH3 !30¬ALL BLANK SEARCH ARGUMENTS, DUPLICATE SEARCH ARGUMENTS, AND AR
GUMENTS CONSISTING OF A SINGLE "+" ARE IGNORED; A "+" IN A SEARCH ARGUMENT IS IG
NORED IF THE PRECEDING STRING CONSISTS SOLELY OF A SINGLE CHARACTER )HLH3 !30¬SE
ARCH ARGUMENTS MAY BE IN ANY ORDER )HLH3 !30¬A NON-TRIVIAL BLANK IN THE INPUT ST
REAM IS TREATED AS AN ORDINARY BLANK, BUT A NON-TRIVIAL BLANK IN A SEARCH ARGUME
NT IS NOT CHANGED; THUS, NO STRINGS CAN BE LOCATED THAT MATCH A SEARCH ARGUMENT
 CONTAINING A NON-TRIVIAL BLANK )HLH3 !30¬ONLY ORDINARY AND "AS-IS" TEXT ARE SEAR
CHED ON THE INPUT STREAM; ¢COMMAND ¢WORDS, CONTROL CARDS, AND TITLES ARE NOT )HL
H3 !30¬COMPARISONS ARE MADE ON AN UPPER CASE BASIS; IF TEXT OR SEARCH ARGUMENTS
 CONTAIN LOWER CASE LETTERS, THEY ARE CONVERTED TO UPPER CASE FOR THE COMPARISON
 )HLH3 !30¬DATASET REFERENCE NUMBER 3 IS REQUIRED (SEE ¢SECTION ¢I¢X) )HIP¢ FORMA
T )¢ SCANS THE INPUT TEXT FOR WORDS AND STRINGS THAT MATCH A SEARCH ARGUMENT, AN
D ACCUMULATES AS MUCH DATA AS IT CAN HOLD BEFORE WRITING ANY OUTPUT. WHEN ITS TA
BLES ARE FULL (OR WHEN ALL THE INPUT TEXT HAS BEEN SCANNED), THE PROGRAM WRITES
 THE RESULTS ON THE ¢SYSTEM ¢OUTPUT DATASET IN ALPHABETIC ORDER, FOR THAT SECTION
 OF THE INPUT TEXT, WITH THE LOCATIONS OF THE MATCHING STRINGS IN ASCENDING ORDE
R OF INPUT CARD IMAGE NUMBER. THE SCAN OF THE INPUT TEXT THEN BEGINS AGAIN, IF N
ECESSARY. )P A SEARCH ARGUMENT WITH A NON-LETTER AS ONE OF THE FIRST TWO CHARACT
ERS IS POSITIONED AT THE BEGINNING OF THE ENTRIES FOR THE LETTER OF THE FIRST TW
O CHARACTERS. THUS, THE LOCATED STRINGS WHICH MATCH "¢A*" AND "*¢A" WOULD BOTH B
E FOUND AT THE START OF THE LIST OF SEARCH ARGUMENTS BEGINNING WITH THE LETTER "
¢A". A SEARCH ARGUMENT WHICH CANNOT BE FOUND IS SO ANNOTATED. )P IF THE NUMBER O
F )¢ $LOCATE )¢ ARGUMENTS IS TOO LARGE, )¢ FORMAT )¢ WILL PRINT A MESSAGE ON THE
 ¢SYSTEM ¢OUTPUT DATASET, GIVING THE NUMBER OF THE )¢ $LOCATE )¢ ARGUMENT WHICH
CAUSED THE TABLE OVERFLOW. IT AND THE REMAINING ARGUMENTS CAN THEN BE LOCATED IN
 A SUBSEQUENT COMPUTER RUN. )SU ¢EXAMPLES OF )F EDITOR CONTROL CARD GROUPS )UFLL
L¢A
EDITOR
¬$DELETE 10 5 )¢              (DELETE A SINGLE TEXT OR TITLE WORD) )¢
         !43THE COMPUTER )¢   (INSERTED TEXT) )¢
¬$INSERT 15    )¢             (INSERT BEFORE CONTROL CARD) )¢
       LINES/PAGE = 70 )¢     (INSERTED CONTROL CARD) )¢
¬$DE     16 0 18 6 )¢         (DELETE CONTROL CARDS AND TEXT) )¢
         GO  )¢               (INSERTED CONTROL CARD) )¢
         )P !43THE DATA )¢    (INSERTED TEXT) )¢
 )FF $END CHANGES
 )FF $PUNCH
 )FF $LIST   )¢                  (FORCE LISTING OF NEW MASTER) )¢
GO
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)¢     (¢THIS GROUP WILL PRODUCE ONLY A DICTIONARY) )¢
EDITOR
 )FF $DUPLICATE OLD MASTER
 )FF $NO DOCUMENT
 )FF $OVERRIDE AND PROVIDE A
    DICTIONARY     )¢        (OVERRIDE IS JUST THIS ONE CARD) )¢
GO


TAPE INPUT DATASET
 )FF $OVERRIDE CONTROL CARDS
  COLUMNS/PAGE = 2
  SPECIAL PRINT TRAIN
  LIST THE TAPE
 )FF $LOCATE THE FOLLOWING:
¬¬¬¬TAPE+ )¢ ¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬(LOCATES "TAPE", "TAPESTRY", ETC.)
)¢ ¬¬¬¬CONTROL CARD+
    OLD MASTER
    CARD IMAGE+
    COLUMN-LINE
    RIGHT JUSTIFICATION
    TEXT PROCESSING PROG+
GO

)¢     (¢THIS GROUP COMBINES 3 TAPES AND PUNCHES THE RESULT) )¢
EDITOR
 )FF $PUNCH
 )FF $OMIT THE LISTING OF THE NEW MASTER
 )FF $JOIN TAPE DATASETS 4, 10, AND 9
GO  )¢
)
)S¢ VII. )¢ )U ¢RULES FOR ¢USING )¢ FORMAT )¢ULLL ¢A. )U ¢GENERAL: )P 1.¬¢EAC
¢ FORMAT )¢ JOB MUST BEGIN WITH A CONTROL CARD GROUP (THE MINIMUM CONTROL CAR
ROUP CONSISTS OF THE "¢G¢O" CONTROL CARD). )P 2.¬¢TITLE, FOOTER, AND TEXT INP
MUST APPEAR IN THE FIELD SPECIFIED ON THE )¢ "CARD FIELD" )¢ CONTROL CARD, OR
F NOT USED, IN THE DEFAULT CARD FIELD (CARD COLUMNS 1 THROUGH 80). )P 3.¬¢A )
ORMAT )¢ JOB IS ENDED BY THE APPEARANCE OF THE "¢E" ¢COMMAND ¢OPERAND. MULTIP
)¢ FORMAT )¢ JOBS MAY BE STACKED ONE BEHIND THE OTHER. IF MIXED CARD AND TAPE
SIDENT JOBS ARE TO BE RUN, THE CARD JOBS MUST PRECEDE THE TAPE JOBS (INCLUDIN
N EDIT JOB); THE CARD JOBS MUST NOT USE DATASET REFERENCE NUMBER 2, HOWEVER.
4.¬¢COMMAND ¢WORDS MAY APPEAR FREELY INTERSPERSED THROUGHOUT TEXT AND TITLES.
THOUGH NO TEXT OR TITLE WORD MAY BEGIN WITH A ")" CHARACTER !16NOR THE APPROP
TE "!NN" CONFIGURATION FOR ")"!17, THE ")" MAY BE USED TEXTUALLY WHEN FOLLOWE
Y A BLANK. )LLL ¢B. )U ¢TITLES AND ¢FOOTERS: )U )P 1.¬¢THE CARD IMAGES CONTAI
G THE TITLE MUST IMMEDIATELY FOLLOW THE )¢ "TITLE STARTS ON" )¢ CONTROL CARD
 MUST BE IMMEDIATELY FOLLOWED BY EITHER THE )¢ "FOOTER" )¢ OR THE "¢G¢O" CONT
 CARD. )P 2.¬¢THE CARD IMAGES CONTAINING THE FOOTING TITLE MUST IMMEDIATELY F
OW THE )¢ "FOOTER" )¢ CONTROL CARD AND MUST BE IMMEDIATELY FOLLOWED BY EITHER
E )¢ "TITLE" )¢ OR "¢G¢O" CONTROL CARD. )P 3.¬¢THE "¢L", "¢F", "¢", AND "¢E"
MMAND ¢OPERANDS MAY BE USED IN TITLES. )P 4.¬¢THE TEXT OF A TITLE OR FOOTER M
 BE ENDED BY THE ¢COMMAND ¢OPERAND "¢E". )P 5.¬¢THE "¢L" ¢COMMAND ¢OPERAND AL
S ACTS AS IF SINGLE SPACING WERE IN EFFECT, REGARDLESS OF THE OPERAND FIELD O
HE )¢ "SPACING OF TEXT LINES" )¢ CONTROL CARD (OR ITS DEFAULT). THE "¢E" ¢COM
D ¢OPERAND, IN ADDITION TO ENDING THE TITLE, ALSO SINGLE SPACES. THUS: )LLA
 )¢              TITLE LINE 1 )LL TITLE LINE 2          )¢
)
)L RESULTS IN EXACTLY ONE BLANK LINE BETWEEN TITLE LINES, WHILE )LLA
  )¢              LAST TITLE LINE )LLE        )¢
)
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)L RESULTS IN A MINIMUM OF TWO BLANK LINES SEPARATING THE LAST TITLE LINE FROM T
HE BODY OF THE DOCUMENT.)P 6.¬¢EACH TITLE LINE BEGINS IN THE PRINT POSITION SPE
CIFIED (OR THE DEFAULT, POSITION 1) AND ENDS WHEN A ¢COMMAND ¢WORD CONTAINING EI
THER THE "¢L" OR "¢E" ¢COMMAND ¢OPERAND IS ENCOUNTERED, OR ELSE WHEN THE TITLE L
INE ATTEMPTS TO EXCEED THE LAST PRINTER POSITION ALLOWED TO THE LINE.)P 7.¬¢NO
RIGHT-JUSTIFICATION IS ACCORDED TO TITLES, SINCE NO RIGHT-MOST TITLE LIMIT IS DE
FINED.)P 8.¬¢ALL HYPHENS APPEARING IN TITLES ARE PRINTED. EXCESS BLANKS ARE IGN
ORED. SPECIAL SPACING MAY BE ACHIEVED WITH NON-TRIVIAL BLANKS.)P 9.¬¢THE ¢SPECI
AL ¢OPERANDS MAY BE USED IN TITLES.)LLL ¢C.)U ¢BODY OF THE ¢DOCUMENT:)UP 1.¬¢
INPUT BLANKS BETWEEN WORDS SERVE ONLY AS WORD DELIMITERS (UNLESS OPERATING IN TH
E "AS IS" MODE). WORDS ARE SEPARATED BY A SINGLE BLANK, PLUS THE NUMBER OF BLANK
S REQUIRED TO ACCOMPLISH RIGHT-JUSTIFICATION, IF IN EFFECT (SEE THE)¢ "JUSTIFIC
ATION")¢ CONTROL CARD FOR DETAILS).)P 2.¬¢HYPHENS ARE NOT AUTOMATICALLY INTROD
UCED BY)¢ FORMAT.)¢ A HYPHEN IN THE INPUT STREAM IS PRINTED, AND MAY BE SELECT
ED TO BE THE LAST CHARACTER ON A COLUMN-LINE.)SV
TABS ARE AT 10 AND 50
GO
)¢ VIII.)¢U ¢SUMMARY OF)¢ FORMAT)¢ ¢CONTROL ¢CARDS AND ¢COMMAND ¢OPERANDS)UL
LP ¢THE CONTROL CARDS ARE GROUPED BELOW BY THE OPTIONS TO WHICH THEY REFER. THUS
, THE)¢ "JUSTIFICATION")¢ AND)¢ "NO JUSTIFICATION")¢ CONTROL CARDS ARE PAIRE
D BECAUSE EACH REFERS TO THE RIGHT-JUSTIFICATION OPTION. WITHIN EACH GROUP CERTA
IN DEFAULT VALUES WILL BE ASSUMED IF NO CONTROL CARD FROM THAT GROUP IS USED.)L
LLLLL)TU ¢CONTROL ¢CARDS)UTU ¢IF ¢OMITTED)ULLL)LL¢ BACKSPACE CHARACTER IS SP
ECIAL CHARACTER)¢U NN)UD NO BACKSPACES)LL¢ BETWEEN COLUMNS LEAVE)¢U X)U¢ BL
ANKS)¢D X=2)LL)¢ CAPITALIZE AUTOMATICALLY)L NO CAPITALIZATION AUTOMATICALLY
)¢D ASSUMED)LL¢ CONTROL CARDS END IN COLUMN)¢U X)UD X=80)L¢ CARD FIELD IS)U
¢ X)U¢ THRU)U¢ Y)UD X=1, Y=80)L¢ CARD FIELD EXTENDS THRU)U¢ Y)ULL¢ CENTER
TEXT ON LINE)U¢ X)DU X=5)L¢ START TEXT ON LINE)U¢ X)U¢ IN PRINT POSITION)U
¢ Y)U¢L TEXT STARTS ON LINE)¢U X)¢U IN PRINT POSITION)¢U Y)ULL¢ COLUMNS PER
PAGE =)¢U X)UD X=1)LL¢ COPIES =)U¢ X)UD X=1)L¢ DARK PRINT EACH PAGE)¢U X
)¢U TIMES)¢D X=1)L¢ OUTPUT MEDIUM IS TAPE)L PRINT OUTPUT TAPE)LL CREATE A T
APE FROM CARD INPUT)L LIST THE INPUT DATASET)L PUNCH THE INPUT DATASET)LL CYC
LE THE PAGE NUMBER)L LEFT TOP POSITION FOR PAGE NUMBER)L PAGE NUMBER STARTING
AT)¢U X)UD X=1)L¢ RIGHT TOP POSITION FOR PAGE NUMBER)D¢ ASSUMED)¢LL DICTION
ARY OF WORDS USED)LL DROP CHARACTER FOR 'D' COMMAND IS)¢U X)UD X=75 (DOTS))¢
LL TAPE INPUT DATASET)L EDITOR)L ¬¬$INSERT)L ¬¬$DELETE)L ¬¬$END CHANGES)L ¬
¬$MERGE TAPES)L ¬¬$JOIN TAPES)L ¬¬$DUPLICATE OLD MASTER)L ¬¬$NO DOCUMENT)L ¬
¬$OMIT LISTING OF NEW MASTER)L ¬¬$OVERRIDE)L ¬¬$PUNCH)L ¬¬$LIST)L ¬¬$LOCATE
)LL¢2 FOOTER ON LINE)¢U X)¢U POS'N)¢U Y)¢U AFTER)¢U Z)¢U BLANK LINES)L TI
TLE STARTS ON LINE)¢U X)¢U IN PRINT POSITION)¢U Y)U¢LL GO)¢DD ERROR)¢LL IN
DENT COLUMN)¢U (X1,Y1),...,(X7,Y7))¢U POSITIONS)D¢ X'S,Y'S = 0)¢LL JUSTIFICA
TION)¢D ASSUMED)¢L NO JUSTIFICATION)LL LINES PER PAGE ARE)¢U X)UD X=59)¢LL
NONTRIVIAL BLANK REP'D BY SPECIAL CHAR)¢U NN)UD NN=0)¢L NULL CHARACTER SWITC
H SET TO)¢U X)UD X=1)¢LL PARAGRAPH INDENT IS)¢U X)U¢ PRINT POSITIONS)D¢ X=
5)¢LL REPEAT TITLE ON EVERY PAGE)L STOP PRINTING TITLE)¢D ASSUMED)¢LL SENTEN
CES SEPARATED BY AT LEAST)¢U X)¢U SPACES)¢D X=1)¢LL SEPARATION LINES BETWEEN
PARAGRAPHS ARE)U¢ X)UD X=1)LL¢ SIDE BY SIDE COPIES)LL SPACING OF TEXT LINES
IS)¢U X)UD X=1)¢LL SPECIAL KEYPUNCH)L SPECIAL KEYPUNCH IS A 2741)LL SPECIA
L PRINTER TRAIN)LL TABS ARE SET AT)¢U X1,...,X14)UD TABS SET TO 0)¢LL UNDERL
INE SWITCH SET TO)¢U X)UD X=0)¢LL WIDTH OF COLUMNS IS)¢U X)U¢ PRINT POSITIO
NS)¢D X=64)¢LL 026 KEYPUNCH)L 029 KEYPUNCH)¢D ASSUMED)LLLL)SH ¢COMMAND ¢OP
ERANDS !16¢FORMAT OF ¢COMMAND ¢WORDS IS "¬)¢X...¢Y "!17)¢LLT ¢A -- ENTER "AS IS
" MODE)LT ¢C -- BEGIN A NEW COLUMN)LT ¢D -- TAB TO NEXT TAB STOP, DROPPING DOT
S)LT ¢DN-- TAB TO N-TH TAB STOP, DROPPING DOTS)LT ¢E -- END THE TITLE OR THE F
OOTER, OR END THE JOB)LT ¢F -- CAPITALIZE FIRST LETTERS OF WORDS / STOP)LT ¢HN
-- INDENT (DELAYED) COLUMN USING NTH PAIR / RESTORE)LT ¢IN-- INDENT (NOW) COLUM
N USING NTH PAIR / RESTORE)LT ¢J -- ALWAYS BEGIN A NEW COLUMN-LINE)LT ¢K -- KE
EP THE ENCLOSED TEXT IN ONE TEXT COLUMN)LT ¢L -- BEGIN A NEW COLUMN-LINE WHEN N
OT AT TOP OF COLUMN)LT ¢M -- CENTER TEXT WITHIN THE COLUMN-LINE / STOP)LT ¢P -
- BEGIN A NEW PARAGRAPH)LT ¢S -- BEGIN A NEW PAGE)LT ¢T -- TAB TO NEXT TAB STO

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P )LT ¢TN-- TAB TO N-TH TAB STOP )LT ¢U -- UNDERLINE / STOP UNDERLINING )LT ¢V -
- READ IN THE NEXT GROUP OF CONTROL CARDS )LT ¢WN-- KEEP THE NEXT N LINES IN THE
 SAME COLUMN )LT ¢ -- PRINT IN UPPER CASE ONLY / STOP )LLLL )M ! ¢SPECIAL ¢OPERA
ND ¢VALUES !16¢FORMAT IS "!NN"!17 )L (¢T¢N ¢PRINT ¢TRAIN GRAPHICS SHOWN) )LL N 1
11111111122222222223333333333444444444455 )L N 0123456789012345678901234567890123
345678901 )LL ¬ !10!11!12!13!14!15!16!17!18!19!20!21!22!23!24!25!26!27!28!29!30!
31!32!33!34!35!36!37!38!39!40!41!42!43!44!45!46!47!48!49!50!51 )LLLL ¢THE )¢ EBC
DIC )¢ CARD CODE FOR "¢" IS: 12-8-2 )L ¢THE )¢ EBCDIC )¢ CARD CODE FOR "!" IS: 1
1-8-2 )MS¢ IX. )¢U ¢DATASETS ¢USED BY )¢ FORMAT )¢ULLP ¢THE CORRESPONDENCE BETWE
EN DATASET REFERENCE NUMBERS (¢D¢R¢N) AND SYSTEM DATASET NAMES (WHICH ARE USED I
N THE NAME FIELD OF SYSTEM CONTROL CARDS) IS AS FOLLOWS: )LLV
TABS SET TO 24 33
GO
)¢TU ¬DRN )T ¬OS/360 )LLU )T ¬¬1 )T FT01F001 )L )T ¬¬2 )T FT02F001 )L )T ¬¬3 )T
FT03F001 )L )T ¬¬4 )T FT04F001 )LT ¬¬5 )T FT05F001 )LT ¬¬6 )T FT06F001 )LT ¬¬7 )
T FT07F001 )L )T ¬¬8 )T FT08F001 )L )T¢ ABOVE )T ¢F¢TXX¢F001 )LP ¢DATASET REFERE
NCE NUMBERS 5, 6, AND 7 ARE ASSUMED TO APPLY RESPECTIVELY TO THE ¢SYSTEM ¢INPUT
DATASET, THE ¢SYSTEM ¢OUTPUT DATASET, AND THE ¢SYSTEM ¢PUNCH DATASET. )P THE USE
R MUST VERIFY THAT THE DATASET REFERENCE NUMBERS HE USES ARE IN FACT AVAILABLE;
I.E., THAT THEY HAVE BEEN GENERATED INTO THE OPERATING SYSTEM IN USE AT HIS INST
ALLATION. )P ALL DATASETS CREATED AND USED BY )¢ FORMAT )¢ ARE FORMATTED, SEQUEN
TIAL, AND FIXED LENGTH, AND MAY BE DEFINED AS BLOCKED, IF OPERATING UNDER ¢RELEA
SE 18 OR LATER RELEASES. THIS RESTRICTION IN EARLIER RELEASES IS DUE TO ¢DATA ¢M
ANAGEMENT'S INABILITY TO BACKSPACE A BLOCKED DATASET AND NOT TO THE LOGIC OF THI
S PROGRAM. IF BLOCKED DATASETS ARE USED WITH RELEASES PRIOR TO 18 THE RESULTS WI
LL BE UNPREDICTABLE. )P LABELED TAPES CAN BE USED BY THE PROGRAM PROVIDING THAT
THEY ARE ACCEPTABLE TO THE OPERATING SYSTEM USED. LABELING OF TAPES, IF DESIRED,
 IS THE RESPONSIBILITY OF THE USER. )P BEFORE A FILE-PROTECTED TAPE CAN BE READ
BY ¢O¢S/360, THE MESSAGE "XX ¢I¢E¢C103¢D ¢F" IS TYPED ON THE CONSOLE. THE OPERAT
OR MUST RESPOND WITH "REPLY XX,'¢U'", WHERE XX IS THE ON-LINE MESSAGE NUMBER. )P
 UNDER ¢O¢S/360 THE NUMBER OF ¢I/¢O BUFFERS MAY BE 1 OR 2. THE HIGHER NUMBER IS
ALWAYS PREFERABLE UNLESS THERE IS DIFFICULTY FITTING THE PROGRAM INTO MEMORY, IN
 WHICH CASE THE NUMBER 1 SHOULD BE SPECIFIED WHERE NECESSARY; HOWEVER, PERFORMAN
CE MAY BE SOMEWHAT DEGRADED. )P ALL DATASETS CREATED BY )¢ FORMAT )¢ ARE ENDED B
Y AN "END-OF-FILE" MARK. )P THE FOLLOWING DESCRIBES THE DATASETS CREATED AND USE
D BY )¢ FORMAT: )¢ )LLLW4 ¢DATASET ¢REFERENCE ¢NUMBER 1: )P ¢THIS DATASET RECORD
S CONTROL CARDS, USER ERRORS, AND OTHER INFORMATION, AND IS ALWAYS REQUIRED. IT
MAY BE DIRECT ACCESS DEVICE OR TAPE RESIDENT. ITS RECORD LENGTH IS 97 BYTES. )LL
LW4 ¢DATASET ¢REFERENCE ¢NUMBER 2: )P ¢THIS DATASET IS REQUIRED ONLY IF ONE OR B
OTH OF THE FOLLOWING APPLY: )LLI3¢H 1.¬"EDITOR", "TAPE INPUT", "CREATE A TAPE",
"DICTIONARY", "LIST", )¢ AND/OR )¢ "PUNCH" )¢ HAS BEEN SPECIFIED )HLH 2.¬¢THE ¢C
OMMAND ¢OPERAND "¢K" HAS BEEN USED )IHP ¢THIS DATASET IS A CARD IMAGE SET WHICH
MAY BE RESIDENT EITHER ON TAPE OR ON A DIRECT ACCESS DEVICE. IF THE ¢EDITOR FACI
LITY IS BEING USED, TAPE IS PREFERABLE SINCE THE USER MAY WISH TO KEEP THIS DATA
SET, FILE-PROTECT IT, AND USE IT AGAIN AS AN INPUT DATASET MASTER. )LLLW4 ¢DATAS
ET ¢REFERENCE ¢NUMBER 3: )P THIS DATASET IS REQUIRED ONLY IF )¢ "DICTIONARY" )¢
OR )¢ "$LOCATE" )¢ HAS BEEN SPECIFIED. IT CONTAINS 80 BYTES PER RECORD AND MAY B
E TAPE RESIDENT OR (PREFERABLY) ON A DIRECT ACCESS DEVICE. )LLLW4 ¢DATASET ¢REFE
RENCE ¢NUMBER 4: )P ¢THIS DATASET IS ONLY REQUIRED WHEN PRODUCING A "NEW MASTER"
 INPUT DATASET (OR A DUPLICATE OF THE "OLD MASTER") IN AN EDIT RUN. IT MAY ALSO
BE (BUT NOT IN THE SAME RUN) AN INPUT DATASET TO BE $¢M¢E¢R¢G¢ED OR $¢J¢O¢I¢NED
IN AN EDIT RUN. ITS SPECIFICATIONS ARE IDENTICAL TO THOSE FOR DATASET REFERENCE
NUMBER 2. )LLLW4 ¢DATASET ¢REFERENCE ¢NUMBER 5: )P ¢THIS IS THE ¢SYSTEM ¢INPUT D
ATASET AND IS ALWAYS REQUIRED BY THE PROGRAM. ITS RECORD LENGTH IS ALWAYS 80 BYT
ES. )LLLW4 ¢DATASET ¢REFERENCE ¢NUMBER 6: )P ¢THIS IS THE ¢SYSTEM ¢OUTPUT DATASE
T AND IS ALWAYS REQUIRED BY THE PROGRAM. ITS RECORD LENGTH IS 133 BYTES, AND ¢A¢
S¢A STANDARD CONTROL CHARACTERS ARE USED. )LLLW4 ¢DATASET ¢REFERENCE ¢NUMBER 7:
)P ¢THIS IS THE ¢SYSTEM ¢PUNCH DATASET, AND IS ONLY REQUIRED IF PUNCHED OUTPUT H
AS BEEN REQUESTED. ITS RECORD LENGTH IS ALWAYS 80 BYTES. )LLLW4 ¢DATASET ¢REFERE
NCE ¢NUMBER 8: )P ¢THIS DATASET IS ONLY REQUIRED BY )¢ FORMAT )¢ IF ANY OF THE F
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OLLOWING CONTROL CARDS IS SPECIFIED: )LLV
TAB SET TO 10
GO
)¢T OUTPUT IS TAPE )LT COPIES = 2 )¢ (OR MORE) )LT¢ PRINT OUTPUT TAPE )¢LL ¢THIS
 DATASET IS A PRINTER IMAGE (133 BYTES PER RECORD) SET WHICH CAN BE TAPE OR DIRE
CT ACCESS DEVICE RESIDENT. )LLLW4 ¢DATASET ¢REFERENCE ¢NUMBERS ¢ABOVE 8: )P ¢THE
SE MAY BE USED AS INPUT DATASETS TO BE $¢M¢E¢R¢G¢ED OR $¢J¢O¢I¢NED IN AN EDIT RU
N. THE SPECIFICATIONS FOR THESE DATASETS ARE IDENTICAL TO THOSE FOR DATASET REFE
RENCE NUMBER 2. )S ¢X. )H6U DESCRIPTION OF )¢ FORMAT )¢ FOR ¢O¢S/360 AND ¢SUGGES
TED ¢CONTROL ¢CARDS )HULLP ¢THE DISTRIBUTED ¢SYSTEM/360 )¢ FORMAT )¢ OBJECT DECK
 (PRODUCED BY THE ¢FORTRAN ¢H COMPILER) IS SET UP TO RUN AS AN ¢O¢S/360 OVERLAY
JOB (THE )¢ OVERLAY )¢ CARDS ARE INCLUDED IN THE DECK, BUT MAY BE REMOVED TO RUN
 )¢ FORMAT )¢ IN-LINE). AS AN OVERLAY JOB IT REQUIRES 48,648 (HEX ¢B¢E08) BYTES
OF MEMORY, INCLUDING THE SUBROUTINES FROM THE FULL ¢FORTRAN LIBRARY OF ¢O¢S/360
¢RELEASE 18 WITH THE ¢FORTRAN ¢EXTENDED ¢ERROR ¢HANDLING FACILITY (BUT NOT INCLU
DING ¢I/¢O BUFFERS). )¢ FORMAT )¢ REQUIRES A MINIMUM 64¢K ¢SYSTEM/360 OR ¢SYSTEM
/370 COMPUTER. IN NON-OVERLAY FORM )¢ FORMAT )¢ REQUIRES A MINIMUM OF 79,272 (HE
X 135¢A8) BYTES; IT WILL RUN SOMEWHAT FASTER BECAUSE FEWER ¢I/¢O OPERATIONS WILL
 BE REQUIRED. )P A SUGGESTED )¢ FORMAT )¢ RUN SETUP IS AS FOLLOWS (NOTE THAT THE
 ASTERISKS ALONG THE RIGHT MARGIN ARE SUPPOSED TO APPEAR IN COLUMN 72 OF THE ¢J¢
C¢L STATEMENTS). THE BLOCKSIZES FOR ¢DATASET ¢REFERENCE ¢NUMBERS 1, 3, AND 8 WER
E CHOSEN TO OPTIMIZE STORAGE SPACE USAGE ON A 2314 ¢DIRECT ¢ACCESS ¢STORAGE ¢FAC
ILITY. )LL¢A
 //FORMAT JOB !47!47!47!47
 //LKED EXEC PGM=IEWL,PARM='OVLY,XREF,LIST'
 //SYSPRINT DD SYSOUT=A
 //SYSLIB DD DSNAME=SYS1.FORTLIB,DISP=OLD
 //SYSUT1 DD DISP=(,DELETE),UNIT=2314,SPACE=(CYL,(3,2))
 //SYSLMOD DD DSNAME=GOSET(MAIN),DISP=(NEW,PASS),UNIT=2314,     *
 //              SPACE=(TRK,(12,2,2)),VOLUME=SER=!47!47!47!47!47!47
 //SYSLIN DD *
)
)¢M !24!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!25 )L !33¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬¬¬!33 )L !33¬¬¬¢DISTRIBUTED¬¬¬!33 )L¢ !33¬¬¬¬¬OS/360¬¬¬¬¬¬¬!33 )L !33¬¬¬¬¬FORM
AT¬¬¬¬¬¬¬!33 )L¢ !33¬¬¬OBJECT DECK¬¬¬!33 )¢L !33¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬!33 )L !22!27!27
!27!27!27!27!27!27!27!27!27!27!27!27!27!27!23 )LM )A
 /*
 //GO EXEC PGM=*.LKED.SYSLMOD
 //FT06F001 DD SYSOUT=A
 //FT07F001 DD UNIT=SYSCP
¬//FT01F001 DD UNIT=SYSDA,DISP=(,DELETE),SPACE=(CYL,(3,1)),¬¬¬¬*
 //  DCB=(RECFM=FB,LRECL=97,BLKSIZE=7275,BUFNO=2)
¬//FT03F001 DD UNIT=2314,DISP=(,DELETE),SPACE=(CYL,(6,1)),¬¬¬¬¬*
 //              DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=7280)
 //FT02F001 DD UNIT=(!47!47!47,,DEFER),LABEL=(,NL),                *
 //              VOLUME=(,RETAIN,,,SER=OLDMAS),                 *
 //              DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=8000)
 //FT04F001 DD UNIT=(!47!47!47,,DEFER),LABEL=(,NL),                *
 //              VOLUME=(,RETAIN,,,SER=NEWMAS),                 *
 //              DCB=(BUFNO=2,RECFM=FB,LRECL=80,BLKSIZE=8000)
 //FT08F001 DD UNIT=(!47!47!47,,DEFER),LABEL=(,NL),                *
 //              VOLUME=(,RETAIN,,,SER=OUTPUT),                 *
 //              DCB=(BUFNO=2,RECFM=FBA,LRECL=133,BLKSIZE=3458)
 //FT05F001 DD DATA
)
)M !24!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!27!25 )L !33¬¬¬¬¬¬¬¬¬¬¬¬
¬¬¬¬!33 )L !33¬¬FORMAT )¢ JOB(S)¬¬!33 )L !33¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬¬!33 )L !22!27!27!27
!27!27!27!27!27!27!27!27!27!27!27!27!27!23 )LM ¬/* )P ¢OF THE DATASETS DEFINE
D ABOVE, ONLY )¢ FT01F001, FT05F001, )¢ AND )¢ FT06F001 )¢ ARE ALWAYS REQUIRED.
SEE ¢SECTION ¢I¢X FOR MORE INFORMATION. )P THE )¢ FORMAT )¢ DISTRIBUTION TAPE CO
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NSISTS OF THREE FILES WRITTEN AT A RECORDING DENSITY OF 800 ¢B¢P¢I ON A 9-TRACK TAPE, WITH NO LABELS. ALL LOGICAL RECORDS ARE 80 BYTES LONG, AND EACH PHYSICAL R ECORD IS 1600 BYTES LONG. THE FIRST FILE CONTAINS THE OBJECT DECK (INCLUDING ¢LI NKAGE ¢EDITOR CONTROL STATEMENTS); THE SECOND FILE CONTAINS THE)¢ FORMAT)¢ JOB WHICH PRODUCES THIS MANUAL; THE THIRD FILE CONTAINS THE ¢FORTRAN SOURCE STATEME NTS FROM WHICH THE OBJECT DECK WAS PRODUCED.)S ¢X¢I.)U ¢HINTS AND ¢SUGGESTIONS)U)LLLLF ¢A.)U DOCUMENT PHASE)FULLL 1. THE)¢ TITLE)¢ AND)¢ FOOTER)¢ CONT ROL CARDS, ALONG WITH THEIR FOLLOWING TITLE AND FOOTER TEXTS, MUST BE THE LAST C ONTROL CARDS TO APPEAR IN A CONTROL CARD GROUP BEFORE THE ¢G¢O CONTROL CARD.)LL L 2. IF THE TEXT FOR A TITLE OR FOOTER IS NOT ENDED WITH THE ")¢E" ¢COMMAND ¢OPE RAND,)¢ FORMAT)¢ WILL SEARCH FOR IT BY INCLUDING AS MUCH OF THE FOLLOWING MATE RIAL AS POSSIBLE INTO THE "TITLE". THIS NATURALLY LEADS TO A DOCUMENT OF UNUSUAL PROPORTIONS.)LLL 3. WHEN ENDING AN "AS-IS" REGION (INITIATED BY THE "¢A" ¢COMM AND ¢OPERAND), THE CARD CONTAINING THE ")¬" IN THE INITIAL COLUMNS SHOULD CONTAI N NO OTHER TEXT.)LLL 4. IF AN ERRONEOUS CONTROL CARD IS FOUND, IT IS TREATED BY)¢ FORMAT)¢ AS A "¢G¢O" CARD. THIS MEANS THAT ANY FOLLOWING CONTROL CARDS WILL BE READ IN TEXT MODE; IN PARTICULAR, IF A)¢ "TITLE")¢ CARD FOLLOWS THE BAD CO NTROL CARD, THE "!40¢E" THAT ENDS THE TITLE (OR FOOTER, OF COURSE) WILL APPEAR T O BE THE "!40¢E" THAT ENDS THE TEXT INPUT.)LLL 5. WHEN SETTING UP TAB STOPS AND COLUMN INDENTS, REMEMBER THAT A TAB STOP IN (SAY) COLUMN 10 IS EQUIVALENT TO AN INDENT OF 9 SPACES -- THAT IS, THE LINE POSITION WHERE THE TEXT WILL BEGIN AFTE R INDENTING IS 1 LARGER THAN THE NUMBER OF SPACES INDENTED.)LLLP ¢B.)U EDIT PH ASE)FULLL 1. A SUCCESSFUL EDIT DOES NOT IMPLY A SUCCESSFUL DOCUMENT, SINCE CONF LICTING INFORMATION MAY HAVE BEEN EDITED INTO THE NEW MASTER.)LLL 2. CONTROL CA RDS WRITTEN ONTO THE NEW MASTER ARE UNDER CONTROL OF THE)¢LLM CONTROL CARD ENDS IN COLUMN)¢U NN)UMLL CARD CURRENTLY IN EFFECT.)LLL 3. DURING AN EDIT, THE ME THOD USED TO SEARCH FOR ¢EDITOR CONTROL CARDS CAN OCCASIONALLY CAUSE A NON-CONTR OL CARD TO BE MISTAKEN FOR AN ¢EDITOR CONTROL CARD. (¢DURING AN EDIT, EACH CARD IN THE ¢EDITOR CONTROL CARD GROUP MUST BE CHECKED TO SEE IF IT IS AN ¢EDITOR CON TROL CARD, OR TEXT TO BE INSERTED INTO THE NEW MASTER.) THE VALID ¢EDITOR CONTRO L CARD CHARACTERS ARE SHOWN IN THE LEFTMOST COLUMN OF THE TABLE BELOW; THE INVAL ID COMBINATIONS THAT WILL BE MISTAKEN FOR THE VALID COMBINATIONS ARE SHOWN IN TH E RIGHT COLUMNS.)LLLW16V

TABS AT 22, 32

GO

)FUT VALID)UTU INVALID)ULLT¢ $ME)T $J5 $KV $LN)LT $OV)T $N5 $PN $QE)LT $DE)T $A5 $CN $BV)LT $IN)T $G5 $HV)LT $EN)T $C5 $FE $DV)LT $DU)T $C4 $EM $FD)LT $PU)T $O4 $QM $RD)LT $NO)T $L6 $MW $OE)LT $LI)T $KR $JZ)LT $LO)T $KW $J6)LT $JO)T $KF)LT $OM)T $M4 $NU $PD)¢LLM EDITOR CONTROL CARD EQUIVALENCE S)FLLLM ¢TO AVOID SUCH ERRORS, (1) ARRANGE THE TEXT TO BE INSERTED SO THAT THE FIRST NONBLANK CHARACTER ON THE INPUT CARD IS NOT A "$", OR (2) BE SURE THAT THE FIRST THREE CHARACTERS ARE NOT ONE OF THE INVALID COMBINATIONS.)LLL 4. THE)¢ DICTIONARY)¢ FEATURE REQUIRES THAT THE)U SOURCE)U TEXT BE IN UPPER CASE; TEXT ENTERED WITH THE)¢ "SPECIAL KEYPUNCH")¢ CONTROL CARD IN EFFECT MAY NOT BE PRO CESSABLE BY THIS FACILITY.)SV

TAB SET AT 15

GO

)¢ XII.)¢U ¢ERROR ¢HANDLING AND ¢DIAGNOSTIC ¢MESSAGES)ULLP ¢WITH THE EXCEPTION OF ERRORS MADE DURING AN EDIT RUN, USER ERRORS DO NOT ABROGATE THE DOCUMENT. WH EN A USER ERROR IS FOUND, THE PROGRAM NOTES THE ERROR, ASSUMES APPROPIATE VALUES FOR THE ERRONEOUS DATA, AND CONTINUES. THE ¢EDITOR DOES NOT ALLOW A DOCUMENT TO BE PRODUCED UNLESS THE EDIT WAS ERROR-FREE; HOWEVER, THE EDIT ITSELF CONTINUES TO COMPLETION REGARDLESS OF USER ERRORS.)P THE ERROR DIAGNOSTICS (IF ANY) ARE W RITTEN ONTO THE ¢SYSTEM ¢OUTPUT DATASET AT THE CONCLUSION OF EACH JOB. EACH DIAG NOSTIC CONSISTS OF A TEXTUAL DESCRIPTION OF THE ERROR AND THE PAGE NUMBER, COLUM N NUMBER, AND LINE NUMBER BEING PRODUCED WHEN IT OCCURRED. IF THE ERROR WAS IN T HE INPUT TEXT, THE CHARACTER NUMBER WITHIN THE LINE WHERE THE ERROR OCCURRED IS GIVEN; IF THE ERROR OCCURRED WITHIN A CONTROL CARD GROUP, THEN THE GROUP NUMBER IS GIVEN; AND IF THE ERROR CAN BE LOCALIZED TO A PARTICULAR CONTROL CARD OR ¢EDI TOR INSERTION CARD, THEN THE CARD NUMBER IS GIVEN. ALSO LISTED FOR EACH ERROR IS

A CODE NUMBER THAT REFERS TO A PARAGRAPH BELOW, WHICH GIVES ADDITIONAL INFORMAT ION ABOUT THE ERROR AND DESCRIBES ACTION TAKEN BY THE PROGRAM WHEN IT OCCURS.)L LLW3H3 212!29)¢ CONTROL CARD OPERAND IN ERROR)¢L ¢AN OPERAND ON THE CONTROL CA RD SPECIFIED IS OUTSIDE THE LEGAL RANGE OR IS OTHERWISE IN ERROR. IF THE ERROR O CCURS ON AN ¢EDITOR CONTROL CARD, THE CONTROL CARD IS IGNORED. OTHERWISE, THE PR EVIOUS VALUE OF THE PARAMETERS INVOLVED OR, IF NONE, THE DEFAULT VALUES ARE USED .)HLLW3H3¢ 218!29 UNRECOGNIZED CONTROL CARD)¢L ¢THE SPECIFIED CONTROL CARD IS UNRECOGNIZABLE. IT IS TREATED AS IF IT WERE THE)¢ "SPECIAL PRINTER")¢ AND THE)¢ "GO")¢ CONTROL CARDS. IF THE INPUT STREAM IS NOT ON THE ¢SYSTEM ¢INPUT DATAS ET, IT IS BACKSPACED AND THE UNRECOGNIZABLE CONTROL CARD IS REREAD AS TEXT.)HLL W3H3¢ 219!29 NUMBER OF PRINT POSITIONS REQUIRED NOT AVAILABLE)¢L ¢THE NUMBER OF PRINT POSITIONS REQUIRED BY THIS CONTROL CARD GROUP EXCEEDS THE NUMBER AVAILABL E. THE DOCUMENT IS FORCED LEFTWARD, THE WIDTH OF THE TEXT COLUMNS MAY BE REDEFIN ED TO BE THE LARGEST VALUE POSSIBLE, AND THE NUMBER OF PRINT POSITIONS BETWEEN C OLUMNS MAY BE SET TO 2.)HLLW3H3¢ 220!29 TITLE/FOOTER TOO LONG)L¢ ¢THE TITLE OR FOOTER IS NOT ENDED AFTER THE LAST LINE ALLOTTED TO THE PAGE IS FILLED. THE TIT LE OR FOOTER IS ENDED AND THE PROGRAM LOOKS FOR A CONTROL CARD. IF ISSUED FOR A TITLE, THE)¢ "STOP TITLE")¢ CONTROL CARD IS SIMULATED.)HLLW3H3¢ 237!29 TABS N OT IN ASCENDING ORDER)¢L ¢THE TABS SET IN THE SPECIFIED CONTROL CARD GROUP ARE NOT IN ASCENDING ORDER. STARTING WITH THE FIRST TAB SET OUT OF ORDER, THE TABS A RE SET TO THE LAST POSITION ON THE COLUMN-LINE.)HLLW3H3¢ 249!29 CONTROL CARD NO T FIRST, OR ON DATASET OTHER THAN 5)¢L ¢THE)¢ "EDITOR")¢ OR)¢ "TAPE INPUT DA TASET")¢ CONTROL CARD SPECIFIED IS EITHER NOT THE FIRST CARD OF THE JOB, OR ELS E IT HAS BEEN READ FROM A DATASET WHICH IS NOT THE ¢SYSTEM ¢INPUT DATASET (DATAS ET REFERENCE NUMBER 5). IT IS IGNORED, AND ANY FOLLOWING ¢EDITOR CONTROL CARDS O R INSERTIONS WILL NOT BE PROPERLY INTERPRETED.)HLLW3H3¢ 267!29 TAB IMPROPERLY S ET)L¢ ¢IN THE SPECIFIED CONTROL CARD GROUP A TAB IS SET AT A POSITION BEYOND TH E END OF THE COLUMN-LINE. THE ERRONEOUSLY SET TAB AND THE TABS WHICH FOLLOW IT A RE SET TO THE LAST POSITION ON THE COLUMN-LINE.)HLLW3H3¢ 269!29 IMPROPER STARTI NG LINE FOR DOCUMENT TEXT)¢L ¢THE BODY OF THE DOCUMENT IS POSITIONED IMPROPERLY BY THE SPECIFIED CONTROL CARD GROUP. THE CORRECTIVE ACTION TAKEN IS TO BEGIN TH E TEXT IMMEDIATELY FOLLOWING THE TITLE (BUT NOT ABOVE LINE 5), AND THE TEXT IS E XTENDED THROUGH THE LAST LINE ON THE PAGE.)HLLW3H3¢ 289!29 IMPROPER CONTROL CAR D ORDER)L¢ ¢THE REFERENCED CONTROL CARD IS NEITHER THE)¢ "TITLE", "FOOTER",)¢ NOR "¢G¢O" CONTROL CARD. AN ATTEMPT IS MADE TO ALLOW THE PRESENT CONTROL CARD O RDER.)HLLW3H3¢ 300!29 INDENTS TOO LARGE)¢L ¢THE CUMULATIVE INDENTS IN EFFECT H AVE REDUCED THE EFFECTIVE COLUMN-LINE WIDTH TO ZERO OR LESS. ALL COLUMN INDENTS ARE TURNED OFF AT THE INDICATED CHARACTER POSITION.)HLLW3H3¢ 304!29 CHARACTER S TRING LENGTH EXCEEDS COLUMN WIDTH)L¢ ¢A STRING OF NON-BLANK, UNHYPHENATED CHARA CTERS AT THE INDICATED CHARACTER POSITION IS LONGER THAN THE COLUMN-LINE. IT IS PRINTED WITHOUT HYPHENATION OVER AS MANY LINES AS ARE REQUIRED TO CONTAIN IT.)H LLW3H3¢ 327!29 TAB COMMAND OPERAND IMPROPERLY USED)¢L ¢THE ¢COMMAND ¢OPERAND "¢ T" OR "¢D" AT THE INDICATED CHARACTER POSITION IS BEYOND THE POSITION OF ANY TAB SET, OR IS NOT TO THE RIGHT OF THE CURRENT CHARACTER POSITION, OR IS IN AN INDE NTED PORTION OF THE COLUMN-LINE, OR AN UNSET TAB HAS BEEN USED. THE ¢COMMAND ¢OP ERAND IS IGNORED.)HLLW3H3¢ 513!29 NUMBER OF UNDERLINE SEGMENTS ON PAGE EXCEEDS 99)L¢ ¢AT THE INDICATED CHARACTER POSITION MORE THAN 99 COLUMN-LINES, OR PORTIO NS OF COLUMN-LINES, HAVE BEEN UNDERLINED ON THIS DOCUMENT PAGE. THOSE IN EXCESS OF 99 ARE IGNORED.)HLLW3H3¢ 700!29 UNDEFINED COMMAND OPERAND)L¢ ¢A ¢COMMAND ¢W ORD AT THE INDICATED CHARACTER POSITION (BEFORE THE LINE IS JUSTIFIED) CONTAINS AN UNDEFINED ¢COMMAND ¢OPERAND. IT, AND THE REST OF THE ¢COMMAND ¢WORD, ARE TREA TED AS TEXT. THE ")" IS ALSO PRINTED IF THE UNDEFINED ¢COMMAND ¢OPERAND IS THE F IRST IN THE ¢COMMAND ¢WORD. IF THE ERROR WAS DETECTED DURING AN EDIT, THE NUMBER GIVEN FOR THE ERRONEOUS CONTROL CARD WILL BE THAT OF THE LAST ONE READ BEFORE T HE ERROR WAS DETECTED. IF THE INVALID ¢COMMAND ¢OPERAND IS A ")", THEN)¢ FORMAT)¢ WILL TREAT IT AS THE START OF A NEW ¢COMMAND ¢WORD IF IT IS NOT FOLLOWED BY A BLANK.)HLLW3H3¢ 800!29 UNEXPECTED END OF INPUT)¢L ¢AN UNEXPECTED END OF THE INPUT STREAM HAS OCCURRED, CAUSED BY AN OMITTED "¢G¢O" OR)¢ "$END CHANGES")¢ C ONTROL CARD, OR BY AN OMITTED "¢E" ¢COMMAND ¢OPERAND. SOME OUTPUT MAY BE LOST.) HLLW3H3¢ 802!29 NEW MASTER ALREADY FINISHED)L¢ ¢AN ATTEMPT HAS BEEN MADE BY THE

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 SPECIFIED CONTROL CARD TO CONTINUE THE NEW MASTER AFTER THE END OF THE OLD MAST
ER HAS BEEN REACHED. FOR EXAMPLE, A )¢ "$DELETE" )¢ CONTROL CARD MAY HAVE OCCURR
ED AFTER A )¢ "$DUPLICATE" )¢ CONTROL CARD. THE EDIT CONTINUES. )HLLW3H3¢ 804!29
 EDIT FAILED BECAUSE OF ABOVE ERROR(S) OR BECAUSE NEW MASTER NOT FINISHED )¢L ¢E
RRORS ALREADY NOTED HAVE OCCURRED DURING THE EDIT ENDED BY THE REFERENCED CARD,
 OR ELSE THE NEW MASTER HAS NOT BEEN ENDED BECAUSE THE END OF THE OLD MASTER HAS
 NOT BEEN REACHED OR REFERENCED. THE JOB IS TERMINATED. )HLLW3H3¢ 805!29 REFERENC
ED WORD NOT LOCATED )L¢ ¢THE WORD REFERENCED ON THE SPECIFIED )¢ "$INSERT" )¢ CO
NTROL CARD, OR THE FIRST WORD REFERENCED ON THE SPECIFIED )¢ "$DELETE" )¢ CONTRO
L CARD CANNOT BE LOCATED. THE EDIT CONTINUES. )HLLW3H3¢ 806!29 INPUT/OPERAND MOD
E ERROR )L¢ ¢THE MODE OF THE OPERAND ON THE SPECIFIED )¢ "$INSERT" )¢ OR )¢ "$DE
LETE" )¢ CONTROL CARD DIFFERS FROM THE PRESENT MODE OF THE NEW INPUT DATASET (NE
W MASTER). THAT IS, A WORD NUMBER IS SPECIFIED AND THE NEW MASTER IS IN AN "AS I
S" OR CONTROL CARD REGION (CARD MODE), OR NO WORD NUMBER IS SPECIFIED AND THE NE
W MASTER IS IN A TEXT REGION (WORD MODE). THE EDIT CONTINUES. )HLLW3H3¢ 807!29 E
ND OF $DELETE FIELD NOT FOUND )L¢ ¢THE END OF THE FIELD TO BE DELETED, REFERENCE
D ON THE SPECIFIED )¢ "$DELETE" )¢ CONTROL CARD, CANNOT BE LOCATED. THE EDIT CON
TINUES. )HLLW3H3¢ 814!29 NON-TEXT MODE NOT ENDED )¢L ¢AN "AS IS" OR CONTROL CARD
 REGION EDITED INTO THE MIDDLE OF A TEXT CARD IMAGE HAS NOT BEEN ENDED BEFORE TH
E SPECIFIED CONTROL CARD. THE EDIT CONTINUES IN "TEXT" (WORD) MODE. )HLLW3H3¢ 84
7!29 $INSERT/DELETE/DUPLICATE AND $MERGE/JOIN NOT ALLOWED IN SAME RUN )L¢ ¢EDITO
R CONTROL CARDS )¢ "$INSERT", "$DELETE", )¢ AND )¢ "$DUPLICATE" )¢ MAY NOT APPEA
R IN THE SAME RUN WITH )¢ "$MERGE" )¢ AND )¢ "$JOIN" )¢ CONTROL CARDS. THAT IS,
 MERGES MUST BE ACCOMPLISHED IN A SEPARATE RUN FROM CHANGES AND DUPLICATION. THE
 INDICATED CONTROL CARD IS IN VIOLATION OF THIS RULE. THE EDIT CONTINUES. )HLLW3H
3¢ 857!29 NOT ALLOWED )L¢ ¢THE )¢ "TITLE" )¢ OR )¢ "FOOTER" )¢ CONTROL CARD INDI
CATED IS NOT PERMITTED AS AN OVERRIDING CONTROL CARD. THE EDIT CONTINUES. )HLLW3
H3¢ 922!29 NO TEXT AFTER TAB(S) )L¢ ¢THE LAST TAB ON THE INDICATED LINE IS NOT F
OLLOWED BY TEXT. )HLLW3H3¢ 997!29 TOO MANY BACKSPACES ON ONE PAGE )L¢ ¢TOO MANY
 BACKSPACES HAVE BEEN SPECIFIED ON THE CURRENT PAGE. THE FIRST 99 HAVE BEEN HANDL
ED, BUT ANY AFTER THE 100TH WILL BE TREATED AS NORMAL TEXT CHARACTERS. )S¢ XIII.
 )¢U ¢APPENDIX )ULLP ¢THE FOLLOWING PAGES WERE PRODUCED AT THE CONCLUSION OF THE
 COMPUTER RUN PRODUCING THIS MANUAL. THE )¢ "COLUMNS PER PAGE = 9" )¢ CONTROL CA
RD, THE FIRST CONTROL CARD IN THE FIRST CONTROL CARD GROUP, IS INTENTIONALLY FAU
LTY, AND PRODUCES THE FIRST DIAGNOSTIC. THE FIFTH EXAMPLE OF ¢COMMAND ¢WORDS (AT
 THE END OF ¢SECTION ¢I¢V) PRODUCES THE SECOND. )SV
COLUMNS/PAGE =2
WIDTH = 30
BETWEEN COLUMNS =4
PAGE NUMBER IS NULL
NO CAPITALIZATION AUTOMATICALLY
NO JUSTIFICATION
STOP TITLE
TITLE ON LINE 5
)¢ INDEX )¢E
GO
)LLM ¢A )ML ¢A¢S¢A, 52 )L ¢ASTERISK, 12, 41 )L "¢AS IS", 24, 4, )H6 7, 12, 18, 2
5, 28, 31, 37, 42, 45, 55, 60, SEE ALSO ¢COMMAND ¢OPERAND "¢A" )HL )H6 "¢AS IS"
TEXT MODE, 4, 7, 24, 31, 60 )HL )LLM ¢B )ML¢ "BACKSPACE CHARACTER", )¢H6 9, 10,
23, 27, 46, 60 )HL ¢BACKSPACING OF FILES, 50, 57 )L )¢ "BETWEEN COLUMNS", )¢ 10,
 21, 46 )L ¢BLANK, )H6 1, 2, 4-12, 16, 27, 41, 42, 45, SEE ALSO ¢NON-TRIVIAL BLA
NK )HL ¢BLANK LINES, )H6 14, 16, 19, 26, 45 )HL ¢BLOCKED DATASETS, 50 )L )LLM ¢C
 )ML ¢CAPITALIZATION, )H6 SEE ¢SPECIAL ¢OPERAND "¢", ¢COMMAND ¢OPERANDS "¢" AND
"¢F", AND )¢ "CAPITALIZE AUTOMATICALLY" )¢HL )¢H6 "CAPITALIZE AUTOMATICALLY", )¢
 11, 26, 27, 46 )HL )H6¢ "CARD FIELD", )¢ 11, 12, 37, 38, 44, 46 )HLH6 ¢CENTERIN
G, 7, 17, 20, SEE ALSO ¢COMMAND ¢OPERAND "¢M" AND )¢ "CENTER TEXT ON" )¢H6L )¢ "
CENTER TEXT ON", )¢ 11, 46 )L )H6¢ "COLUMNS PER PAGE", )¢ 11, 21, 46, 61 )HL ¢CO
MMAND ¢OPERANDS, )H6 2, 4-8, 12, 24, 28, 29, 41, 49 )HL )I7 "¢A", 24, 28, 55 )L
"¢C", 24, 28 )L "¢D", 24, 14, 27, 28, 59 )C )LH6 "¢E", 25, 7, 21, 28, 39, 44, 45
, 55, 59 )HL "¢F", 25-28, 44 )L "¢H", 25, 6, 7, 28 )L "¢I", 25, 6, 28 )L "¢J", 2
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H", 19, 14, 31, 47, 56 )H¢L ¢SPECIAL ¢OPERANDS, )H6 31, 4, 6, 8, 24, 34, 49 )HL
)I7 "¢", 31, 6, 19, 33, 34 )L "!", 31-34 )IL )¢ "SPECIAL PRINTER TRAIN", )H6 19,
 12, 48, 57 )H )¢L ¢SPELLING, 14 )L ¢STACKED, )H6 7, 25, 44 )HL )¢H6 "START TEXT
 ON", )¢ SEE )¢ "TEXT STARTS ON" )¢HL )¢H6 "STOP PRINTING TITLE", 20, 47, 57 )¢H
L ¢STRING, )H6 24, 31, 35, 41, 42, 58 )HL ¢SUBSCRIPTS, 2 )L ¢SUPERSCRIPTS, )H6 1
9, 28, 31 )HL )H6 ¢SYSTEM ¢INPUT ¢DATASET, 2, 12, 14, 20, 36, 37, 50, 52, 57, 58
 )HL )H6 ¢SYSTEM ¢OUTPUT ¢DATASET, 2, 9, 13, 17, 42, 50, 52, 57 )HL )H6 ¢SYSTEM
¢PUNCH ¢DATASET, 2, 18, 40, 50, 52 )HL )LLM ¢T )ML )¢H6 "TABS ARE SET AT", 20, 2
3, 48 )H¢L )H6 ¢TABULATION, SEE ¢COMMAND ¢OPERANDS "¢D" AND "¢T" AND )¢ "TABS AR
E SET AT" )¢HL )¢ "TAPE INPUT DATASET", 20, )H6 35, 36, 41, 47, 51, 58 )¢HL ¢TAP
E LABELS, 50, 54 )L )¢H6 "TEXT STARTS ON", 20, 21, 23 )¢HL )¢H6 "TITLE STARTS ON
", 20, 23, 40, 44, 46, 47, 55, 58, 60 )¢HLH6 ¢T¢N ¢PRINT ¢TRAIN, 2, 32, 49 )HL ¢
TRANSLATION, 19, 31 )L )C )LLM ¢U )ML )H6 ¢UNDERLINING, 17, 21, 27, SEE ALSO ¢CO
MMAND ¢OPERAND "¢U" )HL )LLM ¢W )ML ¢WIDOWS, )H6 SEE ¢COMMAND ¢OPERAND "¢W" )HL
)¢H6 "WIDTH OF COLUMNS", 21, 48 )H¢L )LLL )¢H6 "026 KEYPUNCH", 22, 12, 38, 48 )H
¢L )¢H6 "029 KEYPUNCH", 22, 12, 38, 48 )H¢L )E
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C*******************************************************************************01001000
C                                                                               01002000
C     FORMAT RELEASE 5                                                          01003000
C                                                                               01004000
C     VERSION OF JUNE 24, 1971                                                  01005000
C                                                                               01006000
C*******************************************************************************01007000
      IMPLICIT INTEGER*4 (A - Z)                                                01008000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,              01009000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                                01010000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                        01011000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,                    01012000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,            01013000
     * CIINC,DICT,NEXT,HIT,                                                     01014000
     * ARRAY1(3),                                                               01015000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                      01016000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                         01017000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW01018000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,01019000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,01020000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,01021000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,01022000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         01023000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,    01024000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  01025000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            01026000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                         01027000
C*******************************************************************************01028000
C*******************************************************************************01029000
C    EXEC ROUTINE                                                               01030000
C*******************************************************************************01031000
C*******************************************************************************01032000
100   CALL READY                                                                01033000
      IF (NODOC .EQ. 0) GO TO 101                                               01034000
103   CALL ENDJOB                                                               01035000
101   CALL VRDR                                                                 01036000
      IF (NODOC) 100,105,103                                                    01037000
105   IF (K .GT. 0) GO TO 102                                                   01038000
      CALL EDITOR                                                               01039000
      IF (NODOC) 101,101,100                                                    01040000
102   CALL DRDR                                                                 01041000
      IF (INDEX .EQ. 6) GO TO 101                                               01042000
      GO TO 100                                                                 01043000
      END                                                                       01044000
C                                                                               01045000
C                                                                               01046000
      SUBROUTINE ERR (/POS/,/CODE/)                                             01047000
      IMPLICIT INTEGER*4 (A - Z)                                                01048000
      DIMENSION CARRAY(3)                                                       01049000
      COMMON IOUTPG,COL,LN,ERRCNT                                               01050000
      EQUIVALENCE (CARRAY(1),IOUTPG)                                            01051000
      WRITE (1,1000) CODE,CARRAY,POS                                            01052000
1000  FORMAT ('E',76X,5A4)                                                      01053000
      ERRCNT = ERRCNT + 1                                                       01054000
      RETURN                                                                    01055000
      END                                                                       01056000
C                                                                               01057000
C                                                                               01058000
      BLOCK DATA                                                                01059000
```

```
      IMPLICIT INTEGER*4 (A - Z)                                        01060000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      01061000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        01062000
      INTEGER*2 OVRRDE,F1,F2,CWORD,TITLEX,BUFPT                         01063000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            01064000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     01065000
     * CIINC,DICT,NEXT,HIT,                                             01066000
     * OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,                                 01067000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              01068000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 01069000
      DATA SPCHAR,BLANK,NUM,HYPHEN,SCWORD,                              01070000
C.....                                Z0140                            01071000
     * LOWCAS,CARDIC,POSN,IREAD,LIST,COPIES,IWRITE,CCGCNT               01072000
C.....              0     5    0     1     6     0                     01073000
     *,PUNCH,NODOC,PERIOD,REMNNT,INSWRD,FINISH,DELETE,COVEA,           01074000
C.....    0     0           0    10000     0     0    10                01075000
     * INVALD,BFOUND,KEY028,CICNT,CIINC,MERGE,OVRRDE,F1,F2,             01076000
C.....     0     10          0     0     0     0   1  80                01077000
     * CWORD,TITLEX,BUFPT,DICT                                          01078000
C.....    0     0     1   0                                            01079000
     * /Z8D40,Z9D40,Z8E40,ZA040,Z8B40,Z9B40,ZAD40,ZBD40,Z8C40,ZAE40,    01080000
     * Z9E40,ZBE40,ZAB40,ZBB40,ZAC40,ZBC40,Z8F40,ZBF40,Z9C40,Z9F40,     01081000
     * ZAF40,ZA140,Z5040,Z4F40,Z5F40,Z4C40,Z7E40,Z6E40,Z4E40,Z4D40,     01082000
     * Z5D40,Z7F40,Z7D40,Z4A40,Z7B40,Z6C40,Z7C40,Z6D40,Z5E40,Z7A40,     01083000
     * Z6F40,Z5A40,                                                     01084000
     * '  ','A ','E ','F ','L ','V ','Z ','0 ','1 ','5 ','9 ',        01085000
     * '- ',Z0140,Z4000,'  ',0,5,0,1,6,0,0,0,'. ',0,10000,0,0,10,0,     01086000
     * 10,ZE040,0,0,0,0,1,80,0,0,1,0/                                   01087000
      DATA CICNT1/1/,NEXT/677/,LOCATE/0/,HIT/0/                         01088000
      DATA OMLIST/0/, DOLLAR/'$ '/                                      01089000
      END                                                               01090000
C                                                                       01091000
C                                                                       01092000
      SUBROUTINE READY                                                  01093000
      IMPLICIT INTEGER*4 (A - Z)                                        01094000
      DIMENSION LINE3(5),CARD3(4),INPUTI(20)                            01095000
      INTEGER*2 CODES(25),SRTTXD(25),SRTTXT(26),TEXT(410),E,A,RECORD    01096000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      01097000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        01098000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        01099000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                01100000
      COMMON IOUTPG,COL,LN,ERRCNT                                       01101000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            01102000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     01103000
     * CIINC,DICT,NEXT,HIT,                                             01104000
     * ARRAY1(3),                                                       01105000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              01106000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 01107000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         01108000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK             01109000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW01110000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,01111000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,01112000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,01113000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,01114000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),        01115000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,   01116000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW, 01117000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),           01118000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                        01119000
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```
      DATA CODES,SRTTXT                                                 01120000
     */212,218,219,237,249,267,269,289,300,304,922,327,513,700,800,802, 01121000
     * 804,805,806,807,847,814,857,220,997,                            01122000
     * 1,16,29,53,67,92,101,121,135,144,166,176,194,218,231,243,257,293,01123000
     * 307,319,334,366,378,384,395,411/                                 01124000
      INTEGER*2 TEXT1(100), TEXT2(100), TEXT3(100), TEXT4(10)           01125000
      EQUIVALENCE (TEXT(101),TEXT1(1)),(TEXT(201),TEXT2(1)),            01126000
     *            (TEXT(301),TEXT3(1)),(TEXT(401),TEXT4(1))             01127000
      DATA TEXT /'CONTROL CARD OPERAND IN ERROR UNRECOGNIZED CONTROL CAR01128000
     *D NUMBER OF PRINT POSITIONS REQUIRED NOT AVAILABLETABS NOT IN ASCE01129000
     *NDING ORDER CONTROL CARD NOT FIRST, OR ON DATASET OTHER THAN 5TAB 01130000
     *IMPROPERLY SET'/                                                  01131000
      DATA TEXT1                                                        01132000
     *       /    'IMPROPER STARTING LINE FOR DOCUMENT TEXTIMPROPER CON01133000
     *TROL CARD ORDER INDENTS TOO LARGE CHARACTER STRING LENGTH EXCEEDS 01134000
     *COLUMN WIDTHNO TEXT AFTER TAB(S)TAB COMMAND OPERAND IMPROPERLY USE01135000
     *D NUMBER OF UNDE'/                                                01136000
      DATA TEXT2                                                        01137000
     *            / 'RLINE SEGMENTS ON PAGE EXCEEDS 99 UNDEFINED COMMAN01138000
     *D OPERAND UNEXPECTED END OF INPUT NEW MASTER ALREADY FINISHED EDIT01139000
     * FAILED BECAUSE OF ABOVE ERROR(S) OR BECAUSE NEW MASTER NOT FINISH01140000
     *EDREFERENCED WORD '/                                              01141000
      DATA TEXT3                                                        01142000
     *            /   'NOT LOCATED INPUT/OPERAND MODE ERRORSEND OF $DELE01143000
     *TE FIELD NOT FOUND$INSERT/DELETE/DUPLICATE AND $MERGE/JOIN NOT ALL01144000
     *OWED IN SAME RUNNON-TEXT MODE NOT ENDED NOT ALLOWED TITLE/FOOTER T01145000
     *OO LONG TOO MANY BAC'/                                            01146000
      DATA TEXT4                                                        01147000
     *                    /'KSPACES ON ONE PAGE '/                     01148000
      EQUIVALENCE (LINE3(1),LINEX(1)),(E,NUM(2)),(CARD3(1),LINEX(41)),  01149000
     * (A,NUM(1)),(SRTTXD(1),SRTTXT(2)),(INPUTI(1),CARD(2))             01150000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,   01151000
     *                BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,   01152000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                    01153000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW, 01154000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,   01155000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                    01156000
      LOGICAL*1 BACHAR(100)                                             01157000
      INTEGER*4 BAKZRO(119)                                             01158000
      EQUIVALENCE (BACKCH,BAKZRO(1))                                    01159000
      IF (DICT .LT. 0) STOP 1                                           01160000
      IF (CCGCNT .EQ. 0) GO TO 733                                      01161000
      REWIND 1                                                          01162000
      I = 1                                                             01163000
730   WRITE (6,1001)                                                    01164000
1001  FORMAT ('1',51X,30HFORMAT RELEASE 5 CONTROL CARDS///15X,'GROUP  PA01165000
     *GE  COLUMN  LINE  NO.')                                           01166000
      JUNK = 0                                                          01167000
      J = 4                                                             01168000
      DO 725 I = I, CCCNT                                               01169000
      IF (J .GT. 55) GO TO 730                                          01170000
716   READ (1,1006) RECORD,CARD3,INPUTI                                 01171000
1006  FORMAT (A1,24A4)                                                  01172000
      IF (RECORD .NE. A) GO TO 716                                      01173000
      IF (JUNK .EQ. CARD3(1)) GO TO 729                                 01174000
      JUNK = CARD3(1)                                                   01175000
      WRITE (6,1002) CARD3,I,INPUTI                                     01176000
1002  FORMAT (/11X,4I7,I6,7X,20A4)                                      01177000
      J = J + 2                                                         01178000
      GO TO 725                                                         01179000
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729   WRITE (6,1005) I,INPUTI                                          01180000
1005  FORMAT (39X,I6,7X,20A4)                                          01181000
      J = J + 1                                                        01182000
725   CONTINUE                                                         01183000
      IF (ERRCNT .EQ. 0) GO TO 733                                     01184000
      REWIND 1                                                         01185000
      I = 1                                                            01186000
731   WRITE (6,1003)                                                   01187000
1003  FORMAT ('1',60X,11HDIAGNOSTICS///' CODE  PAGE  COLUMN  LINE  CHAR/01188000
     *GROUP/CARD',7X,'ERROR'/)                                         01189000
      J = 5                                                            01190000
      DO 727 I = I, ERRCNT                                             01191000
      IF (J .GT. 55) GO TO 731                                         01192000
711   READ (1,1008) RECORD,LINE3                                       01193000
1008  FORMAT (A1,76X,5A4)                                              01194000
      IF (RECORD .NE. E) GO TO 711                                     01195000
C....NEXT STATEMENT MUST REFLECT THE NUMBER OF ERROR CODES             01196000
      DO 734 K = 1, 25                                                 01197000
      IF (LINE3(1) .EQ. CODES(K)) GO TO 736                            01198000
734   CONTINUE                                                         01199000
736   JUNK = SRTTXT(K)                                                 01200000
      ALT = SRTTXD(K) - 1                                              01201000
      WRITE (6,1004) LINE3,(TEXT(K), K = JUNK, ALT)                    01202000
1004  FORMAT (2I5,2I7,I11,9X,40A2)                                     01203000
      J = J + 1                                                        01204000
727   CONTINUE                                                         01205000
733   ALT = 1                                                          01206000
      ASIS = 0                                                         01207000
      AUTO = 1                                                         01208000
      BLNKLN = 1                                                       01209000
      CAP = 0                                                          01210000
      CCCNT = 0                                                        01211000
      CCGCNT = 0                                                       01212000
      CCHAR = 0                                                        01213000
      CCWIDT = 80                                                      01214000
      CENTER = 0                                                       01215000
      CHARCO = 64                                                      01216000
      COL = 1                                                          01217000
      COLPAG = 1                                                       01218000
      CPAREN = SPCHAR(31)                                              01219000
      CSEP = 2                                                         01220000
      DARKER = 0                                                       01221000
      DROPCH = PERIOD                                                  01222000
      EDCCWI = 80                                                      01223000
C....CONTROL CARD WIDTH USED IN EDITOR SCAN (SEE CCRDR AND CONDSE)     01224000
      EOSCHR = 0                                                       01225000
      ERRCNT = 0                                                       01226000
      FIELD1 = 1                                                       01227000
      FIELD2 = 80                                                      01228000
      FLN = 5                                                          01229000
      ICINC = 1                                                        01230000
      ID1 = 1                                                          01231000
      INDENT = 5                                                       01232000
      INDEX = 0                                                        01233000
      IOUTPG = 1                                                       01234000
      ITEXT = 0                                                        01235000
      IVALUE = 0                                                       01236000
      KEEP = 0                                                         01237000
      LINPAG = 59                                                      01238000
      TLLN = LINPAG                                                    01239000
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      LINSIZ = 132                                                      01240000
      LN = 0                                                            01241000
      LN2 = 2                                                           01242000
      LSIDE = 132                                                       01243000
      LTITLE = 0                                                        01244000
      SAVMSK = MASK1                                                    01245000
C....FOR USE IN NUMBERING WORDS IN PROPER CASE IN LISTER ROUTINE        01246000
      MASK1 = LOWCAS                                                    01247000
      MASK2 = LOWCAS                                                    01248000
      MYPAGE = 1                                                        01249000
      NEWH = 0                                                          01250000
      NOTRIV = 0                                                        01251000
      NSYM = 3                                                          01252000
      NULLSW = 1                                                        01253000
      PAGENO = 1                                                        01254000
      PARA = 0                                                          01255000
      REPTTL = 0                                                        01256000
      RIVER = 10                                                        01257000
      RSIDE = 0                                                         01258000
      SPACNG = 1                                                        01259000
      START = 0                                                         01260000
      SWK028 = 0                                                        01261000
      TEXEND = 7788                                                     01262000
      TPLN = 2                                                          01263000
      TWOUP = 1                                                         01264000
      TXTLNE = 3                                                        01265000
      UNDERL = 0                                                        01266000
      UNDRSW = 1                                                        01267000
      USTART = 0                                                        01268000
      WPTX = 0                                                          01269000
      REWIND 1                                                          01270000
      DO 1051 I = 1 , 119                                               01271000
C....THIS LOOP ZEROS ALL THE BACKSPACE FLAGS AND ARRAYS                 01272000
1051  BAKZRO(I) = 0                                                     01273000
      DO 102 I = 1, TEXEND                                              01274000
102   PAGDUM(I) = BLANK                                                 01275000
      DO 105 I = 1, 27                                                  01276000
C....THIS LOOP ZEROES CU(8), TAB2(7), INDP(4), AND INDARR(8) ARRAYS     01277000
105   CU(I) = 0                                                         01278000
      RETURN                                                            01279000
      END                                                               01280000
C                                                                       01281000
C                                                                       01282000
      SUBROUTINE COND (INPUT, LINE)                                     01283000
      IMPLICIT INTEGER*4 (A-Z)                                          01284000
      LOGICAL*1 INPUT(80),CRDC                                          01285000
      INTEGER*2 LINE(133),F,Z,A,ONE,ZERO,FIVE,NINE,QUOTES,CENTS,EXPT,   01286000
     * QMARK                                                            01287000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      01288000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                       01289000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        01290000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            01291000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BPOUND,CICNT1,CICNT,    01292000
     * CIINC,DICT,NEXT,HIT,                                             01293000
     * ARRAY1(3),                                                       01294000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              01295000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 01296000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         01297000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK             01298000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,   01299000
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     *                    BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,  01300000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                       01301000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW,   01302000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,      01303000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                       01304000
      LOGICAL*1 BACHAR(100)                                               01305000
      EQUIVALENCE (F,NUM(3)),(Z,NUM(6)),(A,NUM(1)),(ONE,NUM(8)),(ZERO,    01306000
     * NUM(7)),(QUOTES,SPCHAR(32)),(FIVE,NUM(9)),(NINE,NUM(10))           01307000
     *,(CENTS,SPCHAR(34)),(EXPT,SPCHAR(42)),(QMARK,SPCHAR(41))            01308000
     *,(CRDC,CARDIC)                                                      01309000
      FIELD3 = 0                                                          01310000
      IF (SPOP .EQ. 0) ASSIGN 917 TO SPOP                                 01311000
      DO 907 I = FIELD1, FIELD2                                           01312000
      CRDC = INPUT(I)                                                     01313000
      IF (CARDIC .EQ. NOTRIV) CARDIC = KEY028                             01314000
C.....ALLOW NONTRIVIAL BLANKS IN TITLES AND FOOTERS                       01315000
      GO TO SPOP, (917,900,901,911)                                       01316000
C.....SP. OP. IS   NONE CTS EXPT CO                                       01317000
900   ASSIGN 917 TO SPOP                                                  01318000
      IF (CARDIC .GE. A .AND. CARDIC .LE. NINE) GO TO 925                 01319000
C.....THE ABOVE IS CODE DEPENDENT                                         01320000
      EXCNT = CENTS                                                       01321000
      GO TO 930                                                           01322000
925   IF (CARDIC .GT. Z) CARDIC = CARDIC - MASK2                          01323000
      GO TO 927                                                           01324000
901   IF (EXCNT .NE. BLANK) GO TO 913                                     01325000
      EXCNT = CARDIC                                                      01326000
      IF (CARDIC .GE. ONE .AND. CARDIC .LE. FIVE) GO TO 907               01327000
      EXCNT = EXPT                                                        01328000
      ASSIGN 917 TO SPOP                                                  01329000
      PER = 10                                                            01330000
      GO TO 930                                                           01331000
913   ASSIGN 917 TO SPOP                                                  01332000
      IF (CARDIC .LT. ZERO .OR. CARDIC .GT. NINE) GO TO 915               01333000
      N = (10 * EXCNT + CARDIC + 42048) / 256                             01334000
C.....THE ABOVE IS CODE DEPENDENT                                         01335000
      IF (N .LE. 42) GO TO 919                                            01336000
915   FIELD3 = FIELD3 + 1                                                 01337000
      LINE(FIELD3) = EXPT                                                 01338000
930   FIELD3 = FIELD3 + 1                                                 01339000
      LINE(FIELD3) = EXCNT                                                01340000
      EXCNT = BLANK                                                       01341000
      GO TO 914                                                           01342000
919   CARDIC = SPCHAR(N)                                                  01343000
      EXCNT = BLANK                                                       01344000
      IF (N .GT. 40) PER = 10                                             01345000
      GO TO 927                                                           01346000
904   N = 32000                                                           01347000
      LB = 10                                                             01348000
922   UP1 = 0                                                             01349000
      IF (PER + CAP + FIRST .GT. 10) UP1 = 10                             01350000
      IF (PER .EQ. 0) IF (N) 907,928,908                                  01351000
      GO TO 908                                                           01352000
906   PER = 10                                                            01353000
      LB = 0                                                              01354000
927   UP1 = 0                                                             01355000
      GO TO 908                                                           01356000
911   IF (CARDIC .NE. BLANK) GO TO 910                                    01357000
      ASSIGN 917 TO SPOP                                                  01358000
      N = CP - 1                                                          01359000
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      CP = 0                                                            01360000
      GO TO 922                                                         01361000
910   CP = CP - 2                                                       01362000
      IF (CARDIC .NE. CENTS) GO TO 923                                  01363000
      UPPER = 10 - UPPER                                                01364000
      GO TO 907                                                         01365000
923   IF (CARDIC .NE. F) GO TO 926                                      01366000
      FIRST = 20 - FIRST                                                01367000
      GO TO 907                                                         01368000
926   IF (CP .GT. 10000) GO TO 908                                      01369000
      CP = 32000                                                        01370000
928   FIELD3 = FIELD3 + 1                                               01371000
      LINE(FIELD3) = SCWORD                                             01372000
      GO TO 908                                                         01373000
902   ASSIGN 900 TO SPOP                                                01374000
      GO TO 916                                                         01375000
905   CP = 1                                                            01376000
      ASSIGN 911 TO SPOP                                                01377000
      GO TO 907                                                         01378000
903   ASSIGN 901 TO SPOP                                                01379000
916   PER = 0                                                           01380000
      LB = 0                                                            01381000
      GO TO 907                                                         01382000
917   IF (CARDIC .LT. 0) GO TO 918                                      01383000
C.....THE ABOVE IS CODE-DEPENDENT                                       01384000
914   IF (CARDIC .EQ. BLANK) GO TO 904                                  01385000
      IF (CARDIC .EQ. CPAREN .AND. LB .NE. 0) GO TO 905                 01386000
      IF (CARDIC .EQ. CENTS) GO TO 902                                  01387000
      IF (CARDIC .EQ. EXPT) GO TO 903                                   01388000
      IF (CARDIC .EQ. PERIOD .OR. CARDIC .EQ. QMARK) GO TO 906          01389000
      IF (CARDIC .EQ. CPAREN .OR. CARDIC .EQ. QUOTES) GO TO 920         01390000
918   PER = 0                                                           01391000
920   LB = 0                                                            01392000
      IF (-UPPER .NE. UP1) GO TO 927                                    01393000
      IF (CARDIC .LE. Z .AND. CARDIC .NE. KEY028 .AND. CARDIC .GE. A)   01394000
     * CARDIC = CARDIC - MASK1                                          01395000
908   FIELD3 = FIELD3 + 1                                               01396000
      LINE(FIELD3) = CARDIC                                             01397000
907   CONTINUE                                                          01398000
      RETURN                                                            01399000
      END                                                               01400000
C                                                                       01401000
C                                                                       01402000
      SUBROUTINE VRDR                                                   01403000
      IMPLICIT INTEGER*4 (A - Z)                                        01404000
      DIMENSION LINE1(14),CARD1(54),CARRAY(3),FMTO(3),FMTI(2),FMTIN(22) 01405000
     *,INPUTI(20)                                                       01406000
      LOGICAL*1 INPUT(80),CRDC                                          01407000
      INTEGER*2 VV(47),OVPT,LINE2(80),LINE(133),BUFCHR,L,E,TAB(14)      01408000
     *,NINE,ZERO,OVRCC(7787),OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,INDARH(14) 01409000
     *,TAB1(13)                                                         01410000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      01411000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                       01412000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        01413000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                01414000
      COMMON IOUTPG,COL,LN,ERRCNT                                       01415000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            01416000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,    01417000
     * CIINC,DICT,NEXT,HIT,                                             01418000
     * OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,                                 01419000
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     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                    01420000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                       01421000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),              01422000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                  01423000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUMD,TW01424000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,M,01425000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWKD28,IIU,01426000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,01427000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,01428000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),          01429000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,     01430000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,   01431000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),             01432000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                          01433000
      DATA VV,TITLE,OVPT                                                  01434000
     */-11418,-20155,-16265,-15383,-20667,-15365,-12487,-16332,-15549,    01435000
     * -14791,-12008,-12155,-12221,-20485, -1192,-12316,-12442,-12029,    01436000
     * -14997,-16344,-14743,-19883, -8152, -8149,-20487,-15563,           01437000
     * -12217,-12215,-18650,-20121,-20151,-12295,-19941,-15051,-16252,    01438000
     * -14809,-12489,-19384,-20425,-20123,                                01439000
     * -20229,-19848,-20763,-15323,-20153,-15545,-11738,                  01440000
     * 0,0/                                                               01441000
      DATA FMTO/'(133H      ) '/,FMTI/'(80H    '/,BLBL/'     '/          01442000
      EQUIVALENCE (TAB1(2),TAB(1)),(CARD5,CARD1(41)),(LINE1(1),CARD5),   01443000
     * (CARD6,CARD1(42)),(CARD1(1),LINE(1)),(LINE2(1),LINE(1))            01444000
     *,(TAB(1),TAB2(1)),(LINE(1),LINEX(1)),(FMTIN(2),CARD(2),INPUT(1),    01445000
     * INPUTI(1)),(CRDC,CARDIC),(L,NUM(4)),(E,NUM(2)),(CARRAY(1),IOUTPG)  01446000
     *,(BUFCHR,JUNK),(NINE,NUM(10)),(ZERO,NUM(7)),(CARD7,CARD1(43))      01447000
     *,(OVRCC(1),PAGDUM(2)),(INDARH(1),INDARR(2))                        01448000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,    01449000
     *                BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,    01450000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                      01451000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW,  01452000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,     01453000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                      01454000
      LOGICAL*1 BACHAR(100)                                              01455000
C*************************************************************************01456000
C*************************************************************************01457000
C   VARIABLE READER ROUTINE                                               01458000
C*************************************************************************01459000
C*************************************************************************01460000
      CARD(1) = FMTI(1)                                                   01461000
      CARD(22) = FMTI(2)                                                  01462000
      IF (DICT .LT. 0) GO TO 219                                          01463000
      CCGCNT = CCGCNT + 1                                                 01464000
      DO 222 I = 1, ID1                                                   01465000
222   PAGDUM(POSN + I) = BLANK                                            01466000
235   IF (OVRRDE .GT. 0) GO TO 242                                        01467000
246   READ (IREAD,FMTIN,END=710)                                          01468000
      CICNT = CICNT + CIINC                                               01469000
      GO TO 245                                                           01470000
242   IF (OVPT .LT. OVRRDE) GO TO 230                                     01471000
      OVRRDE = 0                                                          01472000
      IF (NODOC) 293,246,293                                              01473000
C.....NODOC = 0 OR -10 (FOR $OVERRIDE WITH $NO DOC)                       01474000
230   DO 237 I = 1, 80                                                    01475000
      OVPT = OVPT + 1                                                     01476000
      CARDIC = OVRCC(OVPT)                                                01477000
      INPUT(I) = CRDC                                                     01478000
      OVRCC(OVPT) = BLANK                                                 01479000
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237   CONTINUE
245   WRITE (1,3001) CCGCNT,CARRAY,INPUTI
3001  FORMAT ('A',24A4)
      CCCNT = CCCNT + 1
      DO 281 I = 41, 54
281   CARD1(I) = 0
      K = 0
      NAME = 0
      DO 282 I = 1, CCWIDT
      CRDC = INPUT(I)
      IF (CARDIC .EQ. BLANK) GO TO 282
      K = K + 1
      NAME = 16 * NAME + (CARDIC - 3648) / 256
C.....THE ABOVE IS CODE DEPENDENT
      IF (K .EQ. 3) GO TO 285
282   CONTINUE
285   K = 41
280   ASSIGN 284 TO HIT1
284   IF (I .GE. CCWIDT) GO TO 289
      I = I + 1
      CRDC = INPUT(I)
      IF (CARDIC .LE. NINE .AND. CARDIC .GE. ZERO) GO TO 288
      GO TO HIT1, (284,291)
291   IF (K .EQ. 54) GO TO 289
      K = K + 1
      GO TO 280
288   CARD1(K) = 10 * CARD1(K) + (CARDIC + 4032) / 256
C.....THE ABOVE IS CODE DEPENDENT
      ASSIGN 291 TO HIT1
      GO TO 284
289   IF (NAME .NE. VV(15) .AND. NAME .NE. VV(12) .AND. NAME .NE. VV(38)
C....                  GO                     TITLE                    FOOTER
     *) GO TO 250
      IF (OVRRDE .EQ. 0) GO TO 251
      OVRRDE = -OVRRDE
      BACKSPACE IREAD
      CICNT = CICNT - CIINC
      BACKSPACE 1
      CCCNT = CCCNT - 1
      GO TO 230
250   IF (TITLE .NE. 0) CALL ERR (CCCNT,289)
251   TITLE = 0
      DO 241 K = 1, 47
      IF (NAME .EQ. VV(K)) GO TO (201,202,203,204,205,206,207,208,
     * 209,210,211,212,213,215,219,216,217,265,226,227,228,229,
     * 271,273,274,275,276,265,214,253,243,258,249,257,253,252,298,
     * 283,256,254,
     * 998,999,997,996,995,994,993
     *         ), K
241   CONTINUE
      CALL ERR (CCCNT,218)
      MASK1 = 0
      IF (IREAD .NE. 5) BACKSPACE IREAD
      GO TO 219
C.....WIDTH OF COLUMNS IS XX POSITIONS
201   IF (CARD5 .LT. 1) GO TO 234
      CHARCO = CARD5
      GO TO 235
C.....COLUMNS PER PAGE ARE XX
202   IF (CARD5 .LT. 1 .OR. CARD5 .GT. 8) GO TO 234
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      COLPAG = CARD5                                                        01540000
      GO TO 235                                                             01541000
C.....LINES PER PAGE = XX                                                   01542000
203   IF (CARD5 .LT. 5 .OR. CARD5 .GT. 1000) GO TO 234                      01543000
      LINPAG = CARD5                                                        01544000
      TLLN = CARD5                                                          01545000
      LINSIZ = 7788 / LINPAG                                                01546000
      IF (LINSIZ .GT. 132) LINSIZ = 132                                     01547000
      GO TO 235                                                             01548000
C.....PAGE NUMBER = XX                                                      01549000
204   PAGENO = CARD5                                                        01550000
      GO TO 235                                                             01551000
C.....BETWEEN COLUMNS LEAVE XX POSITIONS                                    01552000
205   CSEP = CARD5                                                          01553000
      GO TO 235                                                             01554000
234   CALL ERR (CCCNT,212)                                                  01555000
      GO TO 235                                                             01556000
C.....PARAGRAPH INDENT = XX                                                 01557000
206   INDENT = CARD5                                                        01558000
      GO TO 235                                                             01559000
C.....SEPARATION BETWEEN PARAGRAPHS = XX LINES                              01560000
207   BLNKLN = CARD5                                                        01561000
      GO TO 235                                                             01562000
C.....JUSTIFICATION                                                         01563000
208   AUTO = 1                                                              01564000
      GO TO 235                                                             01565000
C.....NO JUSTIFICATION                                                      01566000
209   AUTO = 0                                                              01567000
      GO TO 235                                                             01568000
C.....REPEAT TITLE ON EVERY PAGE                                            01569000
210   REPTTL = 10                                                           01570000
      GO TO 235                                                             01571000
C.....STOP REPEATING TITLE                                                  01572000
211   REPTTL = 0                                                            01573000
      GO TO 235                                                             01574000
C.....SPACING = XX                                                          01575000
213   IF (CARD5 .LT. 1) GO TO 234                                           01576000
      SPACNG = CARD5                                                        01577000
      GO TO 235                                                             01578000
C.....CARD FIELD IS XX THRU YY, OR THRU YY                                  01579000
215   IF (CARD6 .NE. 0) GO TO 240                                           01580000
      CARD6 = CARD5                                                         01581000
      CARD5 = 1                                                             01582000
240   IF (CARD5 .LT. 1 .OR. CARD6 .GT. 80 .OR. (CARD5 + 2) .GT. CARD6)      01583000
     * GO TO 234                                                           01584000
      FIELD1 = CARD5                                                        01585000
      FIELD2 = CARD6                                                        01586000
      GO TO 235                                                             01587000
C.....TABS ARE SET AT XX1,...,XX14                                          01588000
216   DO 220 I = 1, 14                                                      01589000
      TAB(I) = LINE1(I)                                                     01590000
220   CONTINUE                                                              01591000
      GO TO 235                                                             01592000
C.....SIDE BY SIDE                                                          01593000
217   TWOUP = 2                                                             01594000
      GO TO 235                                                             01595000
C.....CENTER TEXT ON LINE X                                                 01596000
256   START = 0                                                             01597000
      GO TO 266                                                             01598000
C.....TEXT STARTS ON LINE XX, POSITION YY                                   01599000
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C.....START TEXT ON LINE XX, POSITION YY                                        01600000
265     IF (CARD6 .NE. 0) START = CARD6                                         01601000
266     IF (CARD5 .NE. 0) FLN = CARD5                                           01602000
        GO TO 235                                                               01603000
C.....LEFT TOP POSITION FOR PAGE NUMBER                                         01604000
227     ALT = 0                                                                 01605000
        GO TO 235                                                               01606000
C.....RIGHT TOP POSITION FOR PAGE NUMBER                                        01607000
228     ALT = 1                                                                 01608000
        GO TO 235                                                               01609000
C.....CYCLE PAGE NUMBER                                                         01610000
229     IVALUE = 1                                                              01611000
        GO TO 235                                                               01612000
C.....026 KEYPUNCH                                                              01613000
271     CPAREN = SPCHAR(26)                                                     01614000
        GO TO 235                                                               01615000
C.....029 KEYPUNCH                                                              01616000
273     CPAREN = SPCHAR(31)                                                     01617000
        GO TO 235                                                               01618000
C.....CAPITALIZE AUTOMATICALLY                                                  01619000
274     CAP = 10                                                                01620000
        GO TO 235                                                               01621000
C.....NO CAPITALIZATION AUTOMATICALLY                                           01622000
275     CAP = 0                                                                 01623000
        GO TO 235                                                               01624000
C.....SPECIAL PRINT TRAIN                                                       01625000
C.....SPECIAL KEYPUNCH                                                          01626000
276     MASK1 = 0                                                               01627000
        MASK2 = 0                                                               01628000
C.....CHECK FOR SUPERSCRIPTS DESIRED FROM SPECIAL KEYPUNCH                      01629000
        IF (CARD5 .EQ. 2741) MASK2 = 16384                                      01630000
        GO TO 235                                                               01631000
C.....INDENT THE COLUMN (L1,R1),...,(L7,R7) PRINT POSITIONS                     01632000
214     DO 272 I = 1, 14                                                        01633000
272     INDARH(I) = LINE1(I)                                                    01634000
        GO TO 235                                                               01635000
C.....DICTIONARY OF INPUT WORDS                                                 01636000
254     DICT = 10                                                               01637000
        GO TO 255                                                               01638000
C.....PUNCH                                                                     01639000
252     PUNCH = 10                                                              01640000
C.....CREATE INPUT TAPE                                                         01641000
C.....LIST                                                                      01642000
253     LIST = 10                                                               01643000
255     CIINC = 1                                                               01644000
        IF (IREAD .EQ. 5) GO TO 244                                             01645000
        IF (CICNT .EQ. 0) CICNT = 1                                             01646000
        GO TO 235                                                               01647000
244     CCGCNT = CCGCNT - 1                                                     01648000
        K = -10                                                                 01649000
        F1 = FIELD1                                                             01650000
        F2 = FIELD2                                                             01651000
C.....REQ'D BY FMTIV (EXEC) TO CALL EDITOR ROUTINE TO COPY SYSIN ONTO FT201652000
259     IREAD = 2                                                               01653000
        REWIND 2                                                                01654000
        FIELD1 = 1                                                              01655000
        FIELD2 = 80                                                             01656000
        GO TO 293                                                               01657000
C.....COPIES = XX                                                               01658000
243     COPIES = CARD5                                                          01659000
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      GO TO 235                                                                 01660000
C....PRINT MOUNTED OUTPUT TAPE                                                  01661000
226   NODOC = 10                                                                01662000
C....OUTPUT IS ONTO TAPE                                                        01663000
257   IWRITE = 8                                                                01664000
      GO TO 235                                                                 01665000
C....TAPE INPUT                                                                 01666000
258   IF (IREAD - CCCNT - 4) 200,218,200                                        01667000
C....EDITOR                                                                     01668000
249   IF ((IREAD - CCCNT) .EQ. 4) GO TO 236                                     01669000
C....ABOVE IS EQUIVALENT TO: IF (CCCNT .EQ. 1 .AND. IREAD .EQ. 5) GO 23601670000
200   CALL ERR (CCCNT,249)                                                      01671000
      GO TO 235                                                                 01672000
236   LIST = 10                                                                 01673000
218   CIINC = 1                                                                 01674000
      K = 0                                                                     01675000
C....REQUIRED BY FMTIV (EXEC) TO CALL EDITOR                                    01676000
      GO TO 259                                                                 01677000
C....SENTENCES SEPARATED BY 2 BLANKS MINIMUM                                    01678000
298   EOSCHR = 10                                                               01679000
      IF (CARD5 .EQ. 2) GO TO 235                                               01680000
      EOSCHR = 0                                                                01681000
      GO TO 235                                                                 01682000
C....DARK PRINT N TIMES                                                         01683000
998   DARKER=CARD5                                                              01684000
      IF (CARD5 .GT. 3) DARKER = 3                                              01685000
      GO TO 235                                                                 01686000
C....DROP CHARACTER FOR 'D' COMMAND IS ...                                      01687000
999   IF(CARD5 .NE. 0) GO TO 9991                                               01688000
      DROPCH = PERIOD                                                           01689000
      GO TO 235                                                                 01690000
9991  IF(CARD5 .GE. 10 .AND. CARD5 .LE. 51) GO TO 9992                          01691000
      DROPCH = 256*CARD5 + 64                                                   01692000
C....MAKE UP A FAKE EBCDIC CHARACTER FOR DROPPING ON 'D' COMMAND                01693000
C....CODE DEPENDENT                                                             01694000
      GO TO 235                                                                 01695000
9992  DROPCH = SPCHAR(CARD5-9)                                                  01696000
      GO TO 235                                                                 01697000
C....BACKSPACE CHARACTER IS XX                                                  01698000
997   BACKCH = 0                                                                01699000
      IF (CARD5 .LT. 10  .OR.  CARD5 .GT. 50) GO TO 235                         01700000
      IF (CARD5 .EQ. 43) GO TO 235                                              01701000
C....NO CENTS SIGNS OR EXCLAMATION POINTS FOR BACKSPACING MARKER                01702000
      BACKCH = SPCHAR(CARD5-9)                                                  01703000
      GO TO 235                                                                 01704000
C....NULL SWITCH IS XX                                                          01705000
996   NULLSW = 1                                                                01706000
C....NULLSW=1 IS NORMAL, =2 MEANS CENTER AND UNDERLINE 028'S                    01707000
      IF (CARD5 .EQ. 2) NULLSW = CARD5                                          01708000
      GO TO 235                                                                 01709000
C....CONTROL CARD ENDS IN COLUMN XX                                             01710000
995   CCWIDT = CARD5                                                            01711000
      IF (CARD5 .LE. 6 .OR. CARD5 .GT. 80) CCWIDT = 80                          01712000
      GO TO 235                                                                 01713000
C....NONTRIVIAL BLANK IS REPRESENTED BY SPECIAL CHARACTER NN                    01714000
994   NOTRIV = 0                                                                01715000
      IF (CARD5 .GE. 10 .AND. CARD5 .LE. 51) NOTRIV = SPCHAR(CARD5-9)           01716000
      GO TO 235                                                                 01717000
C....UNDERLINE SWITCH SET TO 0 (UNDERLINES EVERYTHING)                          01718000
993   UNDRSW = 1                                                                01719000
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      IF (CARD5 .EQ. 0) UNDRSW = 0                                          01720000
      GO TO 235                                                             01721000
C....FOOTER ON LINE XX, PRINT POSITION YY, PRECEDED BY ZZ BLANK LINES       01722000
283   J = LINPAG                                                            01723000
      GO TO 263                                                             01724000
248   J = TEXEND                                                            01725000
247   IF (J .EQ. 7788) GO TO 239                                            01726000
      J = J + 1                                                             01727000
      PAGDUM(J) = BLANK                                                     01728000
      GO TO 247                                                             01729000
239   FFLN = LINPAG                                                         01730000
      IF (CARD5 .NE. 0) FFLN = CARD5                                        01731000
      JUNK = 2                                                              01732000
C....2 LINES BETWEEN THE TEXT AND THE FOOTER IS THE DEFAULT                 01733000
      IF (CARD7 .NE. 0) JUNK = CARD7                                        01734000
      TLLN = FFLN - JUNK - 1                                                01735000
C....TLLN IS LAST LINE AVAILABLE TO TEXT; TEXEND = TLLN * LINSIZ            01736000
      TITLNX = FFLN                                                         01737000
      ASSIGN 235 TO DUMMY                                                   01738000
C....."TITLER" ROUTINE                                                      01739000
2001  SPOP = 0                                                              01740000
      CP = 0                                                                01741000
      EXCNT = BLANK                                                         01742000
      FIRST = 0                                                             01743000
      LB = 10                                                               01744000
      PER = 0                                                               01745000
      UPPER = 0                                                             01746000
      UP1 = 0                                                               01747000
      ASSIGN 2215 TO BR2                                                    01748000
      GO TO 2216                                                            01749000
2215  K = 0                                                                 01750000
      CPSW = 0                                                              01751000
2239  XX = (TITLNX - 1) * LINSIZ                                            01752000
      IF (TITLNX .LE. LINPAG) GO TO 2219                                    01753000
      CALL ERR (CCGCNT,220)                                                 01754000
      GO TO 2294                                                            01755000
2219  DO 2221 I = 1, LINSIZ                                                 01756000
2221  PAGDUM(I + XX) = BLANK                                                01757000
      LSTBL = 10                                                            01758000
      I = TITLE                                                             01759000
2214  IF (CPSW .NE. 0) GO TO 2202                                           01760000
2201  CARDIC = LINE(IC)                                                     01761000
      J = 0                                                                 01762000
      IF (CARDIC .EQ. BLANK) GO TO 2200                                     01763000
      IF (CARDIC .EQ. SCWORD) GO TO 2205                                    01764000
2204  LSTBL = 0                                                             01765000
      IF (CARDIC .EQ. KEY028) GO TO 2202                                    01766000
      K = 0                                                                 01767000
      PAGDUM(I + XX) = CARDIC                                               01768000
      IF (TWOUP .GT. 1) PAGDUM(I + XX + LINSZ) = CARDIC                     01769000
2202  IC = IC + 1                                                           01770000
      ASSIGN 2217 TO BR2                                                    01771000
2218  IF (IC .LE. FIELD3) GO TO 2206                                        01772000
2216  IC = 1                                                                01773000
      READ (IREAD,FMTIN,END=710)                                            01774000
      CICNT = CICNT + CIINC                                                 01775000
C....                          CALL COND FOR FOOTER AND TITLE               01776000
      CALL COND (INPUT,LINE)                                                01777000
      GO TO 2218                                                            01778000
2206  GO TO BR2,(2217,2215)                                                 01779000
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2217  IF (CPSW .EQ. 0) GO TO 2207                                    01780000
      CARDIC = LINE(IC)                                              01781000
      IF (CARDIC .EQ. BLANK) GO TO 2208                              01782000
      IF (CARDIC .EQ. E) GO TO 2209                                  01783000
      CPSW = -10                                                     01784000
      IF (CARDIC .EQ. L) GO TO 2210                                  01785000
      J = LN                                                         01786000
      LN = TITLNX                                                    01787000
      CALL ERR (I - TITLE + 1,700)                                   01788000
      LN = J                                                         01789000
      GO TO 2202                                                     01790000
2208  IF (CPSW .GT. 0) GO TO 2211                                    01791000
      CPSW = 0                                                       01792000
2203  J = 10                                                         01793000
      GO TO 2202                                                     01794000
2211  IC = IC - 1                                                    01795000
      CPSW = 0                                                       01796000
      CARDIC = CPAREN                                                01797000
      GO TO 2204                                                     01798000
2210  IF (K .EQ. 0) GO TO 2212                                       01799000
      K = 0                                                          01800000
      GO TO 2202                                                     01801000
2200  IF (LSTBL .NE. 0) GO TO 2203                                   01802000
      LSTBL = 10                                                     01803000
      GO TO 2202                                                     01804000
2205  CPSW = 10                                                      01805000
      GO TO 2202                                                     01806000
2207  IF (J .NE. 0) GO TO 2201                                       01807000
      I = I + 1                                                      01808000
      IF (I .LE. LINSZ) GO TO 2214                                   01809000
      K = 10                                                         01810000
2212  TITLNX = TITLNX + 1                                            01811000
      IF (RSIDE .LT. I - 1) RSIDE = I - 1                            01812000
      GO TO 2239                                                     01813000
2209  IF (K .EQ. 0) TITLNX = TITLNX + 1                              01814000
2294  GO TO DUMMY, (235,221)                                         01815000
C....TITLE STARTS ON LINE XX, POSITION YY                            01816000
212   J = 2                                                          01817000
263   TITLE = 10                                                     01818000
      GO TO 295                                                      01819000
296   J = (CARD5 - 1) * LINSIZ                                       01820000
      DO 260 I = 1, J                                                01821000
260   PAGDUM(I) = BLANK                                              01822000
      IF (CARD5 .NE. 0) TFLN = CARD5                                 01823000
      TITLNX = TFLN                                                  01824000
      ASSIGN 221 TO DUMMY                                            01825000
      GO TO 2001                                                     01826000
221   LTITLE = TITLNX - 1                                            01827000
      LN2 = TITLNX                                                   01828000
      IF (LN2 .EQ. LINPAG) REPTTL = 0                                01829000
      GO TO 235                                                      01830000
C....GO                                                              01831000
219   IF (NODOC .NE. 0) GO TO 293                                    01832000
      CP = 0                                                         01833000
      CPSW = 0                                                       01834000
      END = 1                                                        01835000
      EXCNT = BLANK                                                  01836000
      FIRST = 0                                                      01837000
      IC = 80                                                        01838000
      KEEP = -IABS(KEEP)                                             01839000
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      PER = 0                                                                  01840000
      SPOP = 0                                                                 01841000
      UPPER = 0                                                                01842000
      UP1 = CAP                                                                01843000
      IF (COPIES + IWRITE .GT. 7) IWRITE = 8                                   01844000
      IF (PAGENO .EQ. 0) GO TO 277                                             01845000
      MYPAGE = PAGENO                                                          01846000
      CONST = 1                                                                01847000
      JUNK = PAGENO                                                            01848000
      DO 278 ID1 = 1, PAGENO                                                   01849000
      JUNK = JUNK / 10                                                         01850000
      CONST = 10 * CONST                                                       01851000
      IF (JUNK .EQ. 0) GO TO 279                                               01852000
278   CONTINUE                                                                 01853000
279   ID = ID1 - 1                                                             01854000
277   IOUTPG = MYPAGE                                                          01855000
295   LINSZ = LINSIZ / TWOUP                                                   01856000
264   CWIDTH = START - 1 + (COLPAG * CHARCO) + CSEP * (COLPAG - 1)             01857000
      IF (START .NE. 0) GO TO 261                                              01858000
      START = LINSZ/2 - (CWIDTH + 1)/2 + 1                                     01859000
      GO TO 264                                                                01860000
261   IF (CWIDTH .LE. LINSZ) GO TO 238                                         01861000
      CALL ERR (CCGCNT,219)                                                    01862000
      START = LINSZ - CWIDTH + START                                           01863000
      IF (START .GT. 0) GO TO 238                                              01864000
      START = 1                                                                01865000
      CSEP = 2                                                                 01866000
      CHARCO = (LINSZ - CSEP * (COLPAG - 1)) / COLPAG                          01867000
238   IF (LSIDE .GT. START) LSIDE = START                                      01868000
      IF (TITLE .EQ. 0) GO TO 292                                              01869000
      IF (CARD5 .LE. LINPAG .AND. CARD6 .LE. LINSZ) GO TO 262                  01870000
      CALL ERR (CCCNT,212)                                                     01871000
      CARD5 = J                                                                01872000
      CARD6 = 0                                                                01873000
262   TITLE = START                                                            01874000
      IF (CARD6 .GT. 0) TITLE = CARD6                                          01875000
      IF (LSIDE .GT. TITLE) LSIDE = TITLE                                      01876000
      IF (J - 2) 248,296,248                                                   01877000
292   SWEW(1) = FMTO(1)                                                        01878000
      SWEW(2) = FMTO(2)                                                        01879000
      SWEW(35) = FMTO(3)                                                       01880000
      DO 225 I = 3, 34                                                         01881000
225   SWEW(I) = BLBL                                                           01882000
      IF (ITEXT .LT. LN2) GO TO 267                                            01883000
      JUNK = (LN2 - 1) * LINSIZ + 1                                            01884000
      J = ITEXT * LINSIZ                                                       01885000
      DO 224 I = JUNK, J                                                       01886000
224   PAGDUM(I) = BLANK                                                        01887000
267   DO 231 I = 1, 14                                                         01888000
      IF (TAB(I) .EQ. 0) GO TO 223                                             01889000
      IF (TAB(I) .LE. CHARCO) GO TO 232                                        01890000
      CALL ERR (CCGCNT,267)                                                    01891000
233   TAB(I) = CHARCO                                                          01892000
232   IF (I .EQ. 1 .OR. TAB(I) .GT. TAB1(I) .OR. TAB(I) .EQ. CHARCO) GO 01893000
     1 TO 231                                                                  01894000
      CALL ERR (CCGCNT,237)                                                    01895000
      GO TO 233                                                                01896000
231   CONTINUE                                                                 01897000
223   JUNK = START                                                             01898000
      DO 268 I = 1, COLPAG                                                     01899000
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      COLBEG(I) = JUNK                                                  01900000
      JUNK = JUNK + CHARCO + CSEP                                       01901000
268   CONTINUE                                                          01902000
      ISPOT = JUNK - CSEP - 1                                           01903000
      IF (RSIDE .LT. ISPOT) RSIDE = ISPOT                               01904000
      IF (TWOUP .GT. 1) RSIDE = LINSIZ                                  01905000
      IF (FLN .LE. TLLN) GO TO 269                                      01906000
      CALL ERR (CCGCNT,269)                                             01907000
      FLN = 5                                                           01908000
      TLLN = LINPAG                                                     01909000
269   IF (FLN .GT. LTITLE) LN2 = FLN                                    01910000
      ITEXT = LN2 - 1                                                   01911000
      IF (TXTLNE .GT. 1) LN = LN2                                       01912000
      TEXEND = TLLN * LINSIZ                                            01913000
      K = 10                                                            01914000
C....K, IF USED, SHOULD NOT BE LEFT .LE. 0                              01915000
C                                                                       01916000
293   RETURN                                                            01917000
C                                                                       01918000
C....EOF ON INPUT DATASET                                               01919000
710   IF (TITLE .NE. 0) CALL ERR (CCGCNT,800)                           01920000
      NODOC = 10 - TITLE * 80                                           01921000
      GO TO 293                                                         01922000
      END                                                               01923000
C                                                                       01924000
C                                                                       01925000
C                                                                       01926000
      SUBROUTINE DRDR                                                   01927000
      IMPLICIT INTEGER*4 (A - Z)                                        01928000
      DIMENSION CICNTX(2),INDP1(3),INDAR(7),LINE2(20),FMTOUT(35),       01929000
     * FMTIN(22)                                                        01930000
      LOGICAL*1 PAGOV(15576),PAGOV1(15576),UCHAR,FULLN(132),CC,PLUS,BL, 01931000
     * CCDUM(2),CRDC,INPUT(80)                                          01932000
      INTEGER*2 LINE(133),CUSTRT(8),CUEND(8),SW(66),EW(66),SW1,EW1,     01933000
     * SAVE(4),SAVE1,SAVE2,SWEW2(4)                                     01934000
     *,A,ONE,ZERO,FIVE,NINE,QUOTES,CENTS,EXPT,QMARK,DICTRY(18),TABCHR,  01935000
     * TAB(14),RIIND,LIIND,RHIND,LHIND,INDP2(8),Z                       01936000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      01937000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        01938000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        01939000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                01940000
      COMMON IOUTPG,COL,LN,ERRCNT                                       01941000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            01942000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,    01943000
     * CIINC,DICT,NEXT,HIT,                                             01944000
     * ARRAY1(3),                                                       01945000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              01946000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 01947000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         01948000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK             01949000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW01950000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,01951000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,01952000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,01953000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,01954000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         01955000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,    01956000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  01957000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            01958000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                        01959000
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      DATA DICTRY/'P L S M A V C E J K W I U H D T ¢ F '/,PLUS/'+'/      01960000
      EQUIVALENCE (CUSTRT(1),CU(1)),(CUEND(1),CU(5)),(UCHAR,SPCHAR(38)),01961000
     * (LINE(1),LINEX(1)),(CICNTX(1),CICNT1),(INDP1(1),INDP(2)),         01962000
     * (INDAR(1),                                                        01963000
     * INDARR(2)),(LRI,INDP(2)),(LRH,INDP(4)),(SAVE1,SAVE(1)),(SAVE2,    01964000
     * SAVE(2)),(SAVE(1),KEEPSV(1)),(KEEPS2,KEEPSV(2)),(LINE2(1),        01965000
     * LINEX(1)),(FMTOUT(1),SWEW(1),SWEW2(1)),(CCDUM(1),SWEW(2)),(CC,    01966000
     * CCDUM(2)),(SW(1),SW1,FULLN(1),SWEW2(4)),(BL,BLANK),(FMTIN(2),     01967000
     * INPUT(1),CARD(2)),(CRDC,CARDIC),(EW(1),EW1,SWEW(36)),(PAGOV(1),   01968000
     * PAGOV1(2),PAGDUM(1))                                              01969000
     *,(Z,NUM(6)),(A,NUM(1)),(ONE,NUM(8)),(ZERO,NUM(7)),(QUOTES,         01970000
     * SPCHAR(32)),(FIVE,NUM(9)),(NINE,NUM(10)),(CENTS,SPCHAR(34)),      01971000
     * (EXPT,SPCHAR(42)),(QMARK,SPCHAR(41)),(TAB(1),TAB2(1)),(LIIND,     01972000
     * INDP2(3)),(RIIND,INDP2(4)),(LHIND,INDP2(7)),(RHIND,INDP2(8)),     01973000
     * (INDP2(1),INDP(1))                                                01974000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,    01975000
     *                BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,    01976000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                     01977000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW,  01978000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,    01979000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                     01980000
      LOGICAL*1 BACHAR(100)                                             01981000
      INTEGER*2 BACKJA, BACKJB, BACKJC, JNKHLF                          01982000
      LOGICAL*1 JNKDUM(2)                                               01983000
      EQUIVALENCE (JNKDUM(1),JNKHLF)                                    01984000
      INTEGER*2 CHPUNC(10) /''' ( " . , : ; ) ! ? '/                    01985000
C....PUNCTUATION CHARACTERS NOT TO BE UNDERLINED IF LAST ON UNDERGROUP   01986000
C*************************************************************************01987000
C*************************************************************************01988000
C   ROUTINE TO READ AND NORMALIZE INPUT                                   01989000
C*************************************************************************01990000
C*************************************************************************01991000
      IF (SPOP .EQ. 0) ASSIGN 917 TO SPOP                               01992000
300   AUTOTB = AUTO * (1 - CENTER)                                      01993000
      PDUM = LIIND + LHIND + PARA                                       01994000
      LINEW = CHARCO - PDUM - RIIND - RHIND                             01995000
      IF (LINEW .GT. 0) GO TO 319                                       01996000
      CALL ERR (1,300)                                                  01997000
      LRI = 0                                                           01998000
      LRH = 0                                                           01999000
      PDUM = 0                                                          02000000
      LINEW = CHARCO                                                    02001000
319   IF (ASIS .EQ. 0) GO TO 936                                        02002000
      ASSIGN 917 TO SPOP                                                02003000
      AUTOTB = 0                                                        02004000
      END = 1                                                           02005000
      ENDF = 300                                                        02006000
      IC = FIELD2                                                       02007000
      PER = 0                                                           02008000
      UP1 = 0                                                           02009000
      GO TO 924                                                         02010000
936   ENDF = LINEW + 1                                                  02011000
      TABSEQ = 0                                                        02012000
924   WPT = WPTX                                                        02013000
      LNTW = WPT                                                        02014000
      TW = -1                                                           02015000
      HYPTRX = 0                                                        02016000
      ENDL = END - 1                                                    02017000
      ENDSAV = ENDL                                                     02018000
      IF (WPT .GT. 0) GO TO 909                                         02019000
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      SUND = UNDERL                                                    02020000
      LB = 10                                                          02021000
909   IC = IC + ICINC                                                  02022000
      IF (IC .LE. FIELD2) GO TO 931                                    02023000
932   READ (IREAD,FMTIN,END=708)                                       02024000
      CICNT = CICNT + CIINC                                            02025000
      IC = FIELD1                                                      02026000
931   DO 907 IC = IC, FIELD2                                           02027000
      CRDC = INPUT(IC)                                                 02028000
      IF (CARDIC .EQ. NOTRIV) CARDIC = KEY028                          02029000
      GO TO SPOP, (917,900,901,311,935)                                02030000
C....NOW HANDLING  TXT CTS XPT COP 2CH                                 02031000
900   ASSIGN 917 TO SPOP                                               02032000
      IF (CARDIC .GE. A .AND. CARDIC .LE. NINE) GO TO 9001             02033000
C....THE ABOVE IS CODE DEPENDENT                                       02034000
9002  BAXPTF = 0                                                       02035000
      BACKFL = 0                                                       02036000
      GO TO 917                                                        02037000
C....NONTRIVIAL BLANK LOOKS LIKE A NORMAL ALPHANUMERIC                 02038000
9001  IF (CARDIC .EQ. KEY028) GO TO 9002                               02039000
      END = ENDSAV                                                     02040000
      IF (CARDIC .GT. Z) CARDIC = CARDIC - MASK2                       02041000
      GO TO 929                                                        02042000
901   IF (EXCNT .NE. BLANK) GO TO 913                                  02043000
      IF (CARDIC .LE. FIVE .AND. CARDIC  .GE. ONE) GO TO 9011          02044000
      BAXPTF = 0                                                       02045000
      BACKFL = 0                                                       02046000
      GO TO 914                                                        02047000
9011  EXCNT = CARDIC                                                   02048000
      GO TO 907                                                        02049000
913   ASSIGN 917 TO SPOP                                               02050000
      IF (CARDIC .GT. NINE .OR. CARDIC .LT. ZERO) GO TO 915            02051000
      N = (10 * EXCNT + CARDIC + 42048) / 256                          02052000
C....THE ABOVE IS CODE DEPENDENT                                       02053000
      IF (N .LE. 42) GO TO 919                                         02054000
915   JUNK = EXCNT                                                     02055000
      EXCNT = BLANK                                                    02056000
      BAXPTF = 0                                                       02057000
      BACKFL = 0                                                       02058000
930   LINE(END) = JUNK                                                 02059000
      ENDL = END                                                       02060000
      END = END + 1                                                    02061000
      IF (JUNK .NE. HYPHEN) GO TO 934                                  02062000
      IF (END .LE. ENDF) GO TO 947                                     02063000
      HYPTRX = 1                                                       02064000
948   ASSIGN 935 TO SPOP                                               02065000
      ICINC = 0                                                        02066000
      GO TO 955                                                        02067000
947   EW(WPT) = -END                                                   02068000
934   IF (END - ENDF) 914,914,948                                      02069000
919   CARDIC = SPCHAR(N)                                               02070000
      EXCNT = BLANK                                                    02071000
      END = ENDSAV                                                     02072000
      IF (N .LE. 40) PER = 0                                           02073000
      GO TO 929                                                        02074000
311   ICINC = 1                                                        02075000
      IF (CP .EQ. 2) GO TO 339                                         02076000
940   IF (CARDIC .EQ. BLANK) GO TO 911                                 02077000
      J = 1 + ASIS                                                     02078000
C....SINCE ASIS IS 0 OR 16, J IS 1 OR 17                               02079000
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      DO 303 J = J, 18                                                  02080000
      IF (CARDIC .NE. DICTRY(J)) GO TO 303                              02081000
      INDEX = J                                                         02082000
      CP = 0                                                            02083000
      I = J - 10                                                        02084000
      IF (I .GT. 0) GO TO (338,338,325,338,324,332,910,923), I          02085000
C     .....                  W   I   U   H   D   T   ≠   F              02086000
      GO TO 307                                                         02087000
303   CONTINUE                                                          02088000
      IF (ASIS .EQ. 0) CALL ERR (END + PDUM, 700)                       02089000
      CPSW = 0                                                          02090000
      IF (CP .EQ. 0) GO TO 914                                          02091000
937   LB = 0                                                            02092000
      UP1 = 0                                                           02093000
      WPT = WPT + 1                                                     02094000
      SW(WPT) = END + SUND                                              02095000
      EW(WPT) = 0                                                       02096000
      ENDL = END                                                        02097000
      JUNK = CPAREN                                                     02098000
      GO TO 930                                                         02099000
324   TABCHR = DROPCH                                                   02100000
C     .....TAB CHARACTER SET TO PRESET DROP CHARACTER                   02101000
      GO TO 338                                                         02102000
332   TABCHR = BLANK                                                    02103000
338   WANT = 0                                                          02104000
      CP = 2                                                            02105000
      GO TO 907                                                         02106000
339   IF (CARDIC .GT. NINE .OR. CARDIC .LT. ZERO) GO TO 340             02107000
      WANT = 10 * WANT + (CARDIC + 4032) / 256                          02108000
C     .....THE ABOVE IS CODE DEPENDENT                                  02109000
      GO TO 907                                                         02110000
340   CP = 0                                                            02111000
      IF (INDEX .EQ. 16 .OR. INDEX .EQ. 15) GO TO 322                   02112000
      IF (INDEX .NE. 14) GO TO 318                                      02113000
C     .....INDEX = 14 IS H                                              02114000
      IF (NEWH * WANT * (WANT - WANTIN) * (WANT + WANTIN - 1) .EQ. 0)   02115000
     *   NEWH = 1 - NEWH                                               02116000
      WANTIN = WANT                                                     02117000
      GO TO 940                                                         02118000
325   IF (LNTW .GT. 0) EW(LNTW) = EW(LNTW) + UNDERL - SUND              02119000
      UNDERL = 16384 - UNDERL                                           02120000
      SUND = UNDERL                                                     02121000
      GO TO 907                                                         02122000
322   CHAR = END - 1                                                    02123000
      AUTOTB = 0                                                        02124000
      ICINC = 0                                                         02125000
      IF (WANT .EQ. 0) GO TO 3223                                       02126000
      IF (WANT .GT. 14) GO TO 333                                       02127000
      JUNK = TAB(WANT)                                                  02128000
      J = 14                                                            02129000
      GO TO 3224                                                        02130000
C     .....FORMERLY DO 327 J = 1, 14                                    02131000
3223  J = 1                                                             02132000
3225  JUNK = TAB(J)                                                     02133000
3224  IF (JUNK .GT. (CHAR + PDUM + TABSEQ)) GO TO 329                   02134000
      IF (JUNK .EQ. 0) GO TO 333                                        02135000
      J = J + 1                                                         02136000
327   IF (J .LE. 14) GO TO 3225                                         02137000
333   CALL ERR (CHAR,327)                                               02138000
      GO TO 909                                                         02139000
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329   IF (JUNK .GT. LINEW + PDUM) GO TO 333                          02140000
      TW = WPT                                                       02141000
      TABSEQ = 1                                                     02142000
      J = JUNK - END - PDUM                                          02143000
      IF (J .EQ. 0) GO TO 909                                        02144000
      WPT = WPT + 1                                                  02145000
      TW = WPT                                                       02146000
      SW(WPT) = END                                                  02147000
      EW(WPT) = CHAR + J                                             02148000
330   IF (J .EQ. 0) GO TO 909                                        02149000
      J = J - 1                                                      02150000
      LINE(END) = TABCHR                                             02151000
      END = END + 1                                                  02152000
      GO TO 330                                                      02153000
911   ASSIGN 917 TO SPOP                                             02154000
C.....LB = 10 FROM THE BLANK PRECEDING THE COMMAND WORD              02155000
      CPSW = 0                                                       02156000
C.....REQUIRED BY )K MECHANISM                                       02157000
      UP1 = 0                                                        02158000
      IF (PER + CAP + FIRST .GT. 10) UP1 = 10                        02159000
      IF (CP .EQ. 0) GO TO 907                                       02160000
      IF (ASIS .EQ. 0 .OR. END .NE. 1) GO TO 937                     02161000
      ASIS = 0                                                       02162000
      NSYM = 1                                                       02163000
      GO TO 300                                                      02164000
910   UPPER = 10 - UPPER                                             02165000
      GO TO 907                                                      02166000
923   FIRST = 20 - FIRST                                             02167000
      GO TO 907                                                      02168000
905   CP = 1                                                         02169000
      CPSW = 10                                                      02170000
C.....REQUIRED BY )K MECHANISM                                       02171000
      ASSIGN 311 TO SPOP                                             02172000
      GO TO 907                                                      02173000
902   ASSIGN 900 TO SPOP                                             02174000
      PER = 0                                                        02175000
      GO TO 916                                                      02176000
903   ASSIGN 901 TO SPOP                                             02177000
      PER = 10                                                       02178000
916   ENDSAV = END                                                   02179000
      BAXPTF = BACKFL                                                02180000
C.....WORRY ABOUT HELDUP CHARACTERS ONLY IF BACKING UP               02181000
      GO TO 920                                                      02182000
904   JUNK = SWK028                                                  02183000
      SWK028 = 0                                                     02184000
      IF (BACKFL .EQ. 0) GO TO 9042                                  02185000
C.....BACKSPACE FOLLOWED BY BLANK WILL BE IGNORED                    02186000
      BACKFL = 0                                                     02187000
9041  JUNK = BACKCH                                                  02188000
      GO TO 930                                                      02189000
9042  CONTINUE                                                       02190000
      IF (LB .GT. 0)  IF (JUNK + ASIS) 907,907,921                   02191000
      TABSEQ = 0                                                     02192000
C.....END OF A WORD.                                                 02193000
      EW(WPT) = ENDL                                                 02194000
      SUND = 0                                                       02195000
      LNTW = WPT                                                     02196000
      LB = 10                                                        02197000
      IF (PER + CAP + FIRST .GT. 10) UP1 = 10                        02198000
      IF (PER .EQ. 0) GO TO 921                                      02199000
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      IF (EOSCHR + ASIS .EQ. 10 .AND. END .LT. LINEW) END = END + 1      02200000
      GO TO 921                                                          02201000
906   PER = 10                                                           02202000
      GO TO 920                                                          02203000
935   ICINC = 1                                                          02204000
914   ASSIGN 917 TO SPOP                                                 02205000
C.....   BACKSPACE CHARACTER RECOGNIZED ONLY IN TEXT, TREATED AS NORMAL  02206000
C.....   SOURCE IF PRECEDED OR FOLLOWED BY BLANK.                        02207000
917   IF (0 .NE. LB) GO TO 9171                                          02208000
      IF (0 .EQ. BACKCH) GO TO 9171                                      02209000
      IF (CARDIC .EQ. BACKCH) GO TO 7000                                 02210000
9171  IF (CARDIC .LT. 0) GO TO 939                                       02211000
C.....THE ABOVE IS CODE DEPENDENT                                        02212000
      IF (CARDIC .EQ. BLANK) GO TO 904                                   02213000
      IF (CARDIC .EQ. PERIOD) GO TO 906                                  02214000
      IF (CARDIC .EQ. CPAREN .AND. LB .NE. 0) GO TO 905                  02215000
      IF (CARDIC .EQ. CENTS) GO TO 902                                   02216000
      IF (CARDIC .EQ. EXPT) GO TO 903                                    02217000
      IF (CARDIC .NE. HYPHEN) GO TO 944                                  02218000
      IF (LB .NE. 0) GO TO 918                                           02219000
C.....DO NOT BREAK A LINE ON A HYPHEN WHICH BEGINS A WORD.               02220000
      IF (END .LT. ENDP) GO TO 943                                       02221000
      HYPTRX = 1                                                         02222000
      GO TO 918                                                          02223000
7000  BACKFL = 1                                                         02224000
      GO TO 907                                                          02225000
943   EW(WPT) = -END                                                     02226000
      SWK028 = 0                                                         02227000
      GO TO 918                                                          02228000
939   IF (CARDIC .NE. KEY028) GO TO 918                                  02229000
      CARDIC = BLANK                                                     02230000
      PER = 0                                                            02231000
      UP1 = 0                                                            02232000
      IF (SWK028 .EQ. 0) SWK028 = END                                    02233000
      GO TO (908, 929), NULLSW                                           02234000
927   UP1 = 0                                                            02235000
      GO TO 929                                                          02236000
944   IF (CARDIC .EQ. CPAREN .OR. CARDIC .EQ. QUOTES) GO TO 920          02237000
      IF (CARDIC .EQ. QMARK) GO TO 906                                   02238000
918   PER = 0                                                            02239000
920   IF (LB .EQ. 0) GO TO 946                                           02240000
C.....START OF A WORD.                                                   02241000
      LB = 0                                                             02242000
      WPT = WPT + 1                                                      02243000
      SW(WPT) = END + SUND                                               02244000
      EW(WPT) = 0                                                        02245000
946   IF (UP1 .NE. (-UPPER)) GO TO 927                                   02246000
      IF (CARDIC .LE. Z .AND. CARDIC .GE. A) CARDIC = CARDIC - MASK1     02247000
929   ENDL = END                                                         02248000
908   IF (BACKCH .EQ. 0) GO TO 9084                                      02249000
      IF (LB .NE. 0) GO TO 9084                                          02250000
      IF (CARDIC .EQ. BACKCH) GO TO 7000                                 02251000
9084  LINE(END) = CARDIC                                                 02252000
      IF (BACKFL .EQ. 0) GO TO 921                                       02253000
      IF (CARDIC .EQ. BLANK) GO TO 921                                   02254000
      IF (BACKCT .LT. 99) GO TO 9081                                     02255000
      BACKFL = 0                                                         02256000
      IF (BACKCT .EQ. 16384) GO TO 9041                                  02257000
      BACKCT = 16384                                                     02258000
      CALL ERR(WPT, 997)                                                 02259000
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      GO TO 9041                                                        02260000
9081  IF (BAXPTF .GT. 1) GO TO 9086                                     02261000
      BACKCT = BACKCT + 1                                               02262000
9086  JUNK = SW(WPT)                                                    02263000
      BAKPOS(BACKCT) = END - MOD(JUNK,16384)                            02264000
      IF (BACKWD(WPT) .EQ. 0) GO TO 9082                                02265000
      BACKWD(WPT) = BACKWD(WPT) + 1 - (BAXPTF/2)                        02266000
      GO TO 9083                                                        02267000
9082  BACKWD(WPT) = BACKCT * 256                                        02268000
9083  IF (BACKST(COL) .EQ. 0) BACKST(COL) = BACKCT                      02269000
      BACKND(COL) = BACKCT                                              02270000
      BACHAR(BACKCT) = CRDC                                             02271000
      LINE(END) = BLANK                                                 02272000
      IF (BAXPTF .NE. 1) GO TO 9085                                     02273000
      BAXPTF = 2                                                        02274000
C.....BACKFL = 0 MEANS NO BACKSPACE                                     02275000
C.....BACKFL = 1 MEANS BACKSPACE IN PROCESS OF BEING RESOLVED           02276000
C.....BAXPTF = 0 MEANS NORMAL BACKSPACING IN PROCESS                    02277000
C.....BAXPTF = 1 MEANS CENTS OR EXCLAMATION IS TO BE PUT IN LINE, NOW   02278000
C.....WAITING TO SEE IF FOLLOWING CHARACTERS ARE PART OF BACKSPACE.     02279000
C.....BAXPTF = 2 MEANS NEXT CHARACTER WILL BE PUT IN AS A BACKSPACE, ON 02280000
C.....TOP OF THE SAVED CENTS OR BANG ALREADY THERE.                     02281000
      GO TO 9087                                                        02282000
9085  BAXPTF = 0                                                        02283000
      BACKFL = 0                                                        02284000
9087  END = END - 1                                                     02285000
      ENDL = END                                                        02286000
921   END = END + 1                                                     02287000
      IF (END .GT. ENDF) GO TO 955                                      02288000
907   CONTINUE                                                          02289000
      IF (ASIS .EQ. 0) GO TO 932                                        02290000
C.....GUARANTEED EXIT FOR 'AS IS' REGION TEXT LINE.                     02291000
C     IF (CARDIC .EQ. BLANK) GO TO 925   USED TO BE HERE                02292000
      IF (INPUT(FIELD2) .EQ. BL) GO TO 925                              02293000
C     CARD(FIELD2) = BLANK   USED TO BE HERE, OVERWRITES END OF FORMAT  02294000
      INPUT(FIELD2) = BL                                                02295000
      IC = FIELD2                                                       02296000
      GO TO 931                                                         02297000
318   ICINC = 0                                                         02298000
307   LWI = WPT + 1                                                     02299000
      SW(LWI) = 16384                                                   02300000
      IF (END .LT. ENDF) AUTOTB = 0                                     02301000
      END = 1                                                           02302000
      RIVER = -10                                                       02303000
      WPTX = 0                                                          02304000
      J = WPT                                                           02305000
      GO TO 922                                                         02306000
925   SWK028 = 0                                                        02307000
928   IF (WPT .EQ. 0) GO TO 600                                         02308000
      IF (EW(WPT) .LE. LINEW) GO TO 955                                 02309000
      IF (SW(WPT) .LE. LINEW) GO TO 926                                 02310000
      WPT = WPT - 1                                                     02311000
      GO TO 928                                                         02312000
926   EW(WPT) = LINEW                                                   02313000
C.....MAKE LWI POINT TO THE LAST WORD TO BE INSERTED INTO PAGDUM NOW.   02314000
955   LWI = WPT                                                         02315000
      J = EW(WPT)                                                       02316000
      SWWPT = SW(WPT)                                                   02317000
      SWWPT = MOD(SWWPT,16384)                                          02318000
      WPTX = 1                                                          02319000
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      FCM = SWK028                                                          02320000
      IF (J) 950,951,952                                                    02321000
C.....LAST WORD BEGUN IS INCOMPLETE.                                        02322000
951   IF (LWI .EQ. 1) GO TO 956                                             02323000
      LWI = LWI - 1                                                         02324000
      FCM = SWWPT                                                           02325000
      GO TO 953                                                             02326000
956   CALL ERR (CHARCO,304)                                                 02327000
      SWK028 = 0                                                            02328000
      J = -LINEW                                                            02329000
C.....LAST BREAK CHARACTER WAS A HYPHEN.                                    02330000
950   EW(LWI) = -J                                                          02331000
      FCM = 1 - J                                                           02332000
      SWWPT = FCM                                                           02333000
      SUND = 0                                                              02334000
      GO TO 953                                                             02335000
C.....LAST WORD BEGUN IS COMPLETE (CARDIC = BLANK) OR IS PREFACED BY 023S02336000
952   WPTX = 0                                                              02337000
953   J = LWI                                                               02338000
      IF (SWK028 .GT. 0 .AND. SWK028 .LT. FCM) FCM = SWK028                 02339000
922   CHAR = EW(J)                                                          02340000
      EW(J) = CHAR + UNDERL - SUND                                          02341000
      CHAR = MOD(CHAR,16384)                                                02342000
      IF (J .EQ. TW) CALL ERR (CHARCO,922)                                  02343000
      IF (AUTOTB .EQ. 0 .OR. J .EQ. 1) GO TO 912                            02344000
      GAPS = J - 1                                                          02345000
      WSEPDL = (LINEW - CHAR) / GAPS                                        02346000
      REM = LINEW - CHAR - (WSEPDL * GAPS)                                  02347000
      USEWS1 = GAPS - REM + 1                                               02348000
912   CONTINUE                                                              02349000
C*************************************************************************02350000
C*************************************************************************02351000
C   ROUTINE TO INSERT NORMALIZED TEXT INTO THE PAGE ARRAY                   02352000
C*************************************************************************02353000
C*************************************************************************02354000
      IF (KEEP .EQ. 1) GO TO 209                                            02355000
500   IER700 = (LN - 1) * LINSIZ                                            02356000
      PDUM = PDUM + CENTER * (LINEW - CHAR) / 2                             02357000
      IIU = IER700 + PDUM + COLBEG(COL)                                     02358000
      JUNK = SW1                                                            02359000
      PIVOT = IIU + 16383 - 16384 * AUTOTB + MOD(JUNK,16384)                02360000
      PARA = 0                                                              02361000
      RIVER = -RIVER                                                        02362000
      IF (NEWH .EQ. 0) GO TO 501                                            02363000
      NEWH = 0                                                              02364000
      I = 3                                                                 02365000
      GO TO 715                                                             02366000
501   EWX = 0                                                               02367000
      DO 502 K = 1, LWI                                                     02368000
      SWX = SW(K)                                                           02369000
      IIU = IIU + MOD(SWX,16384) - EWX - 1                                  02370000
      IF (IIU .LE. PIVOT) GO TO 506                                         02371000
      IIU = IIU + WSEPDL                                                    02372000
      IF (RIVER .GT. 0) GO TO 508                                           02373000
      IF (GAPS - USEWS1) 506,514,514                                        02374000
508   IF (GAPS .GT. REM) GO TO 506                                          02375000
514   IIU = IIU + 1                                                         02376000
506   IF (SWX .LT. 16384) GO TO 504                                         02377000
      IF (SWX .GT. 16384) GO TO 503                                         02378000
C.....SW(K) .GT. 2**14 MEANS START UNDERLINE HERE.                          02379000
```

```
      IF (KEEP .NE. 1 .AND. K .EQ. 1) GO TO 700                          02380000
      CCHAR = 10                                                         02381000
      GO TO 600                                                          02382000
503   SWX = SWX - 16384                                                  02383000
      IF (USTART .LT. 99) GO TO 510                                      02384000
C.....NOTE DEPENDENCE ON SIZE OF CHRFIN AND SRT                          02385000
      CALL ERR (IIU - IER700 + 1 - COLBEG(COL),513)                      02386000
      USTART = 16384                                                     02387000
      GO TO 504                                                          02388000
510   USTART = USTART + 1                                                02389000
      IF (CUSTRT(COL) .EQ. 0) CUSTRT(COL) = USTART                       02390000
      CUEND(COL) = USTART                                                02391000
      SRT(USTART) = IIU - IER700 + (LN * 256)                            02392000
504   NSYM = 0                                                           02393000
      JUNK = BACKWD(K)                                                   02394000
      IF(JUNK .EQ. 0) GO TO 5049                                         02395000
      BACKJA = JUNK / 256                                                02396000
      JUNK = BACKJA + MOD(JUNK,256)                                      02397000
      BACKJB = IIU - IER700 - 1 + (LN * 256)                             02398000
      DO 5041 BACKJC = BACKJA, JUNK                                      02399000
5041  BAKPOS(BACKJC) = BAKPOS(BACKJC) + BACKJB                           02400000
      BACKWD(K) = 0                                                      02401000
5049  EWX = EW(K)                                                        02402000
      EWX = MOD(EWX,16384)                                               02403000
      DO 509 SWX = SWX, EWX                                              02404000
      CARDIC = LINE(SWX)                                                 02405000
      PAGDUM(IIU) = CARDIC                                               02406000
      IF (TWOUP .GT. 1) PAGDUM(IIU + LINSZ) = CARDIC                     02407000
      IIU = IIU + 1                                                      02408000
509   CONTINUE                                                           02409000
      GAPS = K                                                           02410000
      IF (EW(K) .GT. 16384 .AND.                                         02411000
     *    USTART .LE. 99) CHRFIN(USTART) = IIU + IIU                     02412000
502   CONTINUE                                                           02413000
C.....END OF TEXT INSERTION. RE-INITIALIZE LINE AND ITS PARAMETERS.      02414000
      END = 1                                                            02415000
      IF (WPTX + SWK028 .EQ. 0) GO TO 600                                02416000
      SW1 = 1 + UNDERL + SWWPT - FCM                                     02417000
      DO 505 I = FCM, ENDF                                               02418000
      LINE(END) = LINE(I)                                                02419000
505   END = END + 1                                                      02420000
      BACKWD(1) = BACKWD(LWI + 1)                                        02421000
      BACKWD(LWI + 1) = 0                                                02422000
      EW1 = HYPTRX * (1 - END)                                           02423000
C*************************************************************************02424000
C*************************************************************************02425000
C   PRINTER ROUTINE                                                      02426000
C*************************************************************************02427000
C*************************************************************************02428000
600   TXTLNE = 1                                                         02429000
      LN = LN + SPACNG                                                   02430000
      IF (LN .LE. TLLN) GO TO 626                                        02431000
612   IF (KEEP .EQ. 20) GO TO 202                                        02432000
629   COL = COL + 1                                                      02433000
      TXTLNE = 2                                                         02434000
      IF (COL .LE. COLPAG) GO TO 601                                     02435000
622   TXTLNE = 3                                                         02436000
      IF (PAGENO .EQ. 0) GO TO 609                                       02437000
      JUNK = PAGENO                                                      02438000
      IF (CONST .NE. JUNK) GO TO 614                                     02439000
```

```
      CONST = 10 * CONST                                                    02440000
      ID = ID1                                                              02441000
      ID1 = ID1 + 1                                                         02442000
614   I = COLBEG(1) + ID                                                    02443000
      POSN = I - ALT * (I - ISPOT)                                          02444000
      CLEAN = IVALUE * (ISPOT + I - POSN - POSN) + POSN                     02445000
C....ISPOT IS THE LAST PRINT POSITION OF THE LAST COLUMN (SET IN VRDR)      02446000
      ALT = IABS(IVALUE - ALT)                                              02447000
      DO 621 I = 1, ID1                                                     02448000
      K = JUNK / 10                                                         02449000
      PAGDUM(CLEAN) = BLANK                                                 02450000
      PAGDUM(POSN) = 256 * (JUNK - 10 * K) - 4032                           02451000
C....THE ABOVE IS CODE DEPENDENT                                            02452000
      IF (TWOUP .EQ. 1) GO TO 617                                           02453000
      PAGDUM(CLEAN + LINSZ) = BLANK                                         02454000
      PAGDUM(POSN + LINSZ) = PAGDUM(POSN)                                   02455000
617   JUNK = K                                                              02456000
      POSN = POSN - 1                                                       02457000
      CLEAN = CLEAN - 1                                                     02458000
621   CONTINUE                                                              02459000
      PAGENO = PAGENO + 1                                                   02460000
609   MYPAGE = MYPAGE + 1                                                   02461000
      IF (REPTTL .EQ. 0) LTITLE = 0                                         02462000
      IF (LTITLE .EQ. 0) LN2 = 1                                            02463000
      IF (CICNT .NE. 0) GO TO 619                                           02464000
      WRITE (IWRITE,1001)                                                   02465000
1001  FORMAT ('1',132X)                                                     02466000
      GO TO 623                                                             02467000
619   WRITE (IWRITE,1000) CICNTX                                            02468000
1000  FORMAT ('1',120X,2I6)                                                 02469000
      CICNT1 = CICNT                                                        02470000
623   KEEPS2 = SW1                                                          02471000
      BR1 = 1                                                               02472000
      IF (USTART .NE. 0) BR1 = BR1 + 1                                      02473000
      IF (BACKCT .NE. 0) BR1 = BR1 + 2                                      02474000
      DO 610 I = 1, 66                                                      02475000
      IF (SW(I) .EQ. BLANK) GO TO 613                                       02476000
      SW(I) = BLANK                                                         02477000
610   CONTINUE                                                              02478000
613   USTART = 0                                                            02479000
      BACKCT = 0                                                            02480000
      K = 0                                                                 02481000
      DO 602 LN = 1, LINPAG                                                 02482000
      DO 605 I = LSIDE,RSIDE                                                02483000
605   FULLN(I) = PAGOV1(K + I + I)                                          02484000
      WRITE (IWRITE,FMTOUT)                                                 02485000
      ASSIGN 6051 TO DRKRET                                                 02486000
      GO TO 800                                                             02487000
6051  GO TO (608,606,6042,606), BR1                                         02488000
C*******************************************************************************02489000
C     A LITTLE RINKYDINK BOLDFACE DARK PRINTING SUBROUTINE                  02490000
C*******************************************************************************02491000
800   IF (DARKER .LE. 1) GO TO 802                                          02492000
      CC = PLUS                                                             02493000
      DO 801 JUNK = 2, DARKER                                               02494000
801   WRITE (IWRITE, FMTOUT)                                                02495000
802   CC = BL                                                               02496000
      GO TO DRKRET, (6051, 6071, 6049)                                      02497000
C*******************************************************************************02498000
C*******************************************************************************02499000
```

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606   I = 0                                                                    02500000
      DO 604 COL = 1, COLPAG                                                   02501000
616   CS = CUSTRT(COL)                                                         02502000
      IF (CS .EQ. 0) GO TO 604                                                 02503000
      JUNK = SRT(CS)                                                           02504000
      IF (JUNK / 256 .NE. LN) GO TO 604                                        02505000
      JUNK = JUNK - LN * 256                                                   02506000
      JUNK = JUNK + JUNK + K                                                   02507000
      BACKJC = JUNK                                                            02508000
      I = CHRFIN(CS) - 2                                                       02509000
      JNKHLF = BLANK                                                           02510000
      EWX = 0                                                                  02511000
      DO 615 JUNK = JUNK, I, 2                                                 02512000
      IF (UNDRSW .EQ. 0) GO TO 6154                                            02513000
      IF (EWX .NE. 0) GO TO 6154                                               02514000
      JNKDUM(1) = PAGOV1(JUNK)                                                 02515000
      IF (JNKHLF .EQ. CHPUNC(1)) GO TO 615                                     02516000
      IF (JNKHLF .EQ. CHPUNC(2)) GO TO 615                                     02517000
      IF (JNKHLF .EQ. CHPUNC(3)) GO TO 615                                     02518000
6154  EWX = JUNK                                                               02519000
      PAGOV(JUNK) = UCHAR                                                      02520000
      IF (TWOUP .GT. 1) PAGOV(JUNK + LINSZ + LINSZ) = UCHAR                    02521000
615   CONTINUE                                                                 02522000
      IF (UNDRSW .EQ. 0 .OR. EWX .EQ. 0) GO TO 6153                            02523000
6155  JNKDUM(1) = PAGOV1(EWX)                                                  02524000
      DO 6151  JUNK = 1 , 10                                                   02525000
      IF (JNKHLF .EQ. CHPUNC(JUNK)) GO TO 6152                                 02526000
6151  CONTINUE                                                                 02527000
      GO TO 6153                                                               02528000
6152  PAGOV(EWX) = BL                                                          02529000
      IF (TWOUP .GT. 1) PAGOV( EWX + LINSZ + LINSZ) = BL                       02530000
      EWX = EWX - 2                                                            02531000
      IF (EWX .GE. BACKJC) GO TO 6155                                          02532000
6153  IF (CUEND(COL) .EQ. CS) CS = -1                                          02533000
      CUSTRT(COL) = CS + 1                                                     02534000
      GO TO 616                                                                02535000
604   CONTINUE                                                                 02536000
      IF (I .EQ. 0) GO TO 6042                                                 02537000
      DO 607 I = LSIDE, RSIDE                                                  02538000
607   FULLN(I) = PAGOV(K + I + I)                                              02539000
      CC = PLUS                                                                02540000
      WRITE (IWRITE,FMTOUT)                                                    02541000
      ASSIGN 6071 TO DRKRET                                                    02542000
      GO TO 800                                                                02543000
6071  CONTINUE                                                                 02544000
6042  IF (BR1 - 3) 608, 6043, 6041                                             02545000
6041  DO 6044 I = LSIDE, RSIDE                                                 02546000
6044  PAGOV(K+I+I) = BL                                                        02547000
6043  I = 0                                                                    02548000
      DO 6046 COL = 1, COLPAG                                                  02549000
6045  CS = BACKST(COL)                                                         02550000
      IF (CS .EQ. 0) GO TO 6046                                                02551000
      JUNK = BAKPOS(CS)                                                        02552000
      IF (JUNK/256 .NE. LN) GO TO 6046                                         02553000
      I = JUNK - LN*256                                                        02554000
      PAGOV(I + I + K) = BACHAR(CS)                                            02555000
      IF (TWOUP .GT. 1) PAGOV(I + I + K + LINSZ + LINSZ) = BACHAR(CS)          02556000
      IF (BACKND(COL) .EQ. CS) CS = -1                                         02557000
      BACKST(COL) = CS + 1                                                     02558000
      GO TO 6045                                                               02559000
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6046  CONTINUE                                                          02560000
      IF (I .EQ. 0) GO TO 6049                                          02561000
      DO 6047 I = LSIDE, RSIDE                                          02562000
6047  FULLN(I) = PAGOV(K+I+I)                                           02563000
      CC = PLUS                                                         02564000
      WRITE (IWRITE, FMTOUT)                                            02565000
      ASSIGN 6049 TO DRKRET                                             02566000
      GO TO 800                                                         02567000
6049  CONTINUE                                                          02568000
608   K = K + LINSIZ + LINSIZ                                           02569000
602   CONTINUE                                                          02570000
      SW1 = KEEPS2                                                      02571000
      JUNK = (LN2 - 1) * LINSIZ + 1                                     02572000
      DO 618 I = JUNK, TEXEND                                           02573000
618   PAGDUM(I) = BLANK                                                 02574000
      IF (LN2 .LT. FLN) LN2 = FLN                                       02575000
      ITEXT = LN2 - 1                                                   02576000
      IOUTPG = MYPAGE                                                   02577000
      COL = 1                                                           02578000
601   LN = LN2                                                          02579000
626   IF (CCHAR .NE. 0) GO TO 700                                       02580000
628   IF (INDEX .NE. 8) GO TO 300                                       02581000
611   RETURN                                                            02582000
C*******************************************************************************02583000
C*******************************************************************************02584000
C   )N ROUTINE                                                        02585000
C*******************************************************************************02586000
C*******************************************************************************02587000
C....LN IS A CLEAN LINE ALWAYS                                          02588000
C....NSYM = 0 IF HAVE ENDED A NON-EMPTY LINE                            02589000
C.....    = 1 IF LINE IS CLEAN, CONTAINS NO TEXT                        02590000
C.....    = 2 IF NEW COLUMN STARTED BY )C COMMAND OPERAND               02591000
C.....    = 3 IF NEW PAGE STARTED BY )S COMMAND OPERAND                 02592000
C....TXTLNE = 1 IF CURRENT COLUMN-LINE IS SOMEHWERE IN MID-COLUMN       02593000
C.....      = 2 IF AT TOP OF COLUMN WITH NORMAL TEXT RUNOVER            02594000
C.....      = 3 IF AT TOP OF PAGE WITH NORMAL TEXT RUNOVER              02595000
700   CCHAR = 0                                                         02596000
      JUNK = NSYM                                                       02597000
      GO TO (705,702,705,730,731,611,704,701,706,709,707,711), INDEX    02598000
C.....          P   L   S   M   A   V   C   E   J   K   W   I           02599000
702   IF ((JUNK * TXTLNE) .EQ. 1) GO TO 600                             02600000
7021  JUNK = 0                                                          02601000
706   NSYM = 1                                                          02602000
      IF (JUNK) 600,300,600                                             02603000
708   CALL ERR (1,800)                                                  02604000
      NODOC = 10                                                        02605000
      INDEX = 8                                                         02606000
701   NSYM = 3                                                          02607000
      LRI = 0                                                           02608000
      LRH = 0                                                           02609000
      INDP(1) = 0                                                       02610000
      INDP(3) = 0                                                       02611000
      KEEP = -IABS(KEEP)                                                02612000
      IF (TXTLNE .LE. 2 .OR. JUNK .GT. 2) GO TO 622                     02613000
      GO TO 628                                                         02614000
704   NSYM = 2                                                          02615000
      KEEP = -IABS(KEEP)                                                02616000
      IF (TXTLNE .LE. 1 .OR. JUNK .GT. 1) GO TO 629                     02617000
      GO TO 300                                                         02618000
705   CENTER = 0                                                        02619000
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      FIRST = 0                                                          02620000
      UNDERL = 0                                                         02621000
      UPPER = 0                                                          02622000
      PER = 10                                                           02623000
      IF (INDEX .EQ. 3) GO TO 701                                        02624000
      PARA = INDENT                                                      02625000
      NSYM = 1                                                           02626000
      IF (TXTLNE .GT. 1) GO TO 300                                       02627000
C.....AT LEAST 2 LINES OF A NEW PARAGRAPH MUST APPEAR IN THE SAME COLUMN 02628000
C.....REQUIRES (BLNKLN+SPACNG) LINES TO FIT                              02629000
      JUNK = LN + BLNKLN + SPACNG                                        02630000
      IF (JUNK .GT. TLLN) GO TO 612                                      02631000
      LN = JUNK - SPACNG                                                 02632000
      GO TO 626                                                          02633000
730   CENTER = 1 - CENTER                                                02634000
      GO TO 7021                                                         02635000
731   ASIS = 16                                                          02636000
      CPSW = 0                                                           02637000
      GO TO 300                                                          02638000
707   IF (LN + WANT * SPACNG - SPACNG - TLLN) 300,300,612                02639000
709   IF (KEEP .EQ. 0) GO TO 710                                         02640000
      KEEP = 0                                                           02641000
      GO TO 300                                                          02642000
710   KEEP = -10                                                         02643000
      IF (TXTLNE .GT. 1) GO TO 300                                       02644000
C.....IGNORE ODD OCCURENCE OF )K AT TOP OF COLUMN                        02645000
C.....INITIALIZE KEEP      )K                                            02646000
      KEEP = 20                                                          02647000
      CIINC = 1                                                          02648000
      SAVE1 = LN                                                         02649000
      SAVE2 = ERRCNT                                                     02650000
      KEEPS2 = CICNT                                                     02651000
      WRITE (1,1009) IC,CUSTRT(COL),USTART,UNDERL,CENTER,FIRST,SPOP,     02652000
     * INDP,PER,UPPER,UP1,FMTIN                                          02653000
1009  FORMAT ('K',40X,14A4/'K',8X,22A4)                                  02654000
      IF (IREAD .NE. 5) GO TO 300                                        02655000
      IREAD = 2                                                          02656000
      REWIND 2                                                           02657000
200   READ (5,1002,END=201) LINE2                                        02658000
1002  FORMAT (20A4)                                                      02659000
      WRITE (2,1002) LINE2                                               02660000
      GO TO 200                                                          02661000
201   ENDFILE 2                                                          02662000
      REWIND 2                                                           02663000
      GO TO 300                                                          02664000
C.....KEEP = 20 AND THE LAST COLUMN-LINE HAS BEEN FILLED                 02665000
202   IF (CPSW .GT. 0) IF (INDEX - 10) 203,629,203                       02666000
C.....INDEX = 10 WHEN COMMAND OPERAND IS K                               02667000
      KEEP = 1                                                           02668000
      GO TO 300                                                          02669000
209   IF (INDEX .EQ. 10 .AND. WPT .EQ. 0 .AND. CPSW .GT. 0) GO TO 500    02670000
C.....KEEP REQUIREMENT EXCEEDS AVAILABLE COLUMN SPACE                    02671000
203   KEEP = 5                                                           02672000
      I = SAVE1                                                          02673000
      DO 204 I = I, TLLN                                                 02674000
      J = COLBEG(COL) + (I - 1) * LINSIZ                                 02675000
      K = J + CHARCO - 1                                                 02676000
      DO 205 JUNK = J, K                                                 02677000
      PAGDUM(JUNK) = BLANK                                               02678000
      IF (TWOUP .GT. 1) PAGDUM(JUNK + LINSZ) = BLANK                     02679000
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205   CONTINUE                                                          02680000
204   CONTINUE                                                          02681000
      I = ERRCNT - SAVE2 + 2                                            02682000
      DO 206 J = 1, I                                                   02683000
      BACKSPACE 1                                                       02684000
206   CONTINUE                                                          02685000
      READ (1,1009) IC,CUSTRT(COL),USTART,UNDERL,CENTER,FIRST,SPOP,INDP,02686000
     * PER,UPPER,UP1,FMTIN                                              02687000
      I = CICNT - KEEPS2                                                02688000
      CICNT = KEEPS2                                                    02689000
207   IF (I .EQ. 0) GO TO 208                                           02690000
      I = I - 1                                                         02691000
      BACKSPACE IREAD                                                   02692000
      GO TO 207                                                         02693000
208   ASIS = 0                                                          02694000
      CCHAR = 0                                                         02695000
      CP = 0                                                            02696000
      CPSW = 10                                                         02697000
      CUEND(COL) = USTART                                               02698000
      END = 1                                                           02699000
      EXCNT = BLANK                                                     02700000
      PARA = 0                                                          02701000
      WPTX = 0                                                          02702000
      GO TO 629                                                         02703000
711   I = 1                                                             02704000
      WANTIN = WANT                                                     02705000
715   JUNK = INDP(I)                                                    02706000
      IF (JUNK .EQ. 0) GO TO 714                                        02707000
      IF (WANTIN .EQ. JUNK .OR. WANTIN .EQ. 0) GO TO 712                02708000
714   IF (WANTIN .EQ. 0 .OR. WANTIN .GT. 7) WANTIN = 1                  02709000
713   INDP1(I) = INDAR(WANTIN)                                          02710000
C.....INDAR(0) IS ZERO                                                  02711000
      INDP(I) = WANTIN                                                  02712000
      IF (I - 1) 300,300,501                                            02713000
712   WANTIN = 0                                                        02714000
      GO TO 713                                                         02715000
      END                                                               02716000
C                                                                       02717000
C                                                                       02718000
C                                                                       02719000
      SUBROUTINE CONDSE (/EOF/)                                         02720000
      IMPLICIT INTEGER*4 (A - Z)                                        02721000
      DIMENSION STABLE(40),FMTIN(22)                                    02722000
      LOGICAL*1 BUFO(80),BL,BFCR                                        02723000
      INTEGER*2 BUFFER(80),A,V,E,PREN26,PREN29,VV(47),COPS(36),         02724000
     * BUFSAV(80),VAR(8),VAR1,VAR2,OVRRDE,F1,F2,CWORD,TITLEX,BUFPT      02725000
     *,BUFCHR                                                           02726000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      02727000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                       02728000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        02729000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                02730000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            02731000
     * REMNNT,INSWRD,FINISH,DELETE,COVER,INVALD,BFOUND,CICNT1,CICNT,    02732000
     * CIINC,DICT,NEXT,HIT,                                            02733000
     * OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,                                02734000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,             02735000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                02736000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         02737000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK            02738000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,MYPTRX,WPT,SUND,TW02739000
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     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,02740000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,02741000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,02742000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,02743000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),        02744000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,PCM,SWWPT,ENDL,EWX,PIVOT,   02745000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW, 02746000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),           02747000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                        02748000
      DATA VV                                                           02749000
     */ -1192,-20485, -8152, -8149,-12155,-19384,-20667,-20487,-20425,  02750000
     * -20155,-20151,-20121,-19941,-19883,-18650,-16344,-16332,-16265,  02751000
     * -16252,-15563,-15549,-15383,-15365,-15051,-14997,-14809,-14791,  02752000
     * -14743,-12489,-12487,-12442,-12316,-12295,-12221,-12217,-12215,  02753000
     * -12029,-12008,-11418,-20123,-20229,-19848,-20763,-15323,-20153,  02754000
     * -15545,-11738           /                                        02755000
      EQUIVALENCE (VAR1,VAR(1)),(VAR2,VAR(2)),(A,NUM(1)),(V,NUM(5)),    02756000
     * (E,NUM(2)),(PREN29,SPCHAR(31)),(PREN26,SPCHAR(26))               02757000
     *,(BUFFER(1),LINEX(1)),(BUFO(1),CARD(2),FMTIN(2),STABLE(2)),(BL,   02758000
     * BLANK),(COPS(1),LINEX(41)),(BFCR,BUFCHR)                         02759000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,   02760000
     *                BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,   02761000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                    02762000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW, 02763000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,   02764000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                    02765000
      LOGICAL*1 BACHAR(100)                                             02766000
      EQUIVALENCE (CENTS,SPCHAR(34))                                    02767000
      INTEGER*2 CENTS                                                   02768000
C                                                                       02769000
      IF (EOF .NE. 0) GO TO 105                                         02770000
      WORDS = 0                                                         02771000
      COPPTR = 1                                                        02772000
      IF (DELETE .NE. 0) GO TO 101                                      02773000
      IF (COVEA - 5) 101,114,102                                        02774000
C....COVEA (-5=END OF ASIS),(0=TEXT OR TITLE),(5=ASIS),(10=CONTROL CD)  02775000
136   IF (F1 .EQ. 1) GO TO 139                                          02776000
      J = 1                                                             02777000
      DO 137 I = F1, F2                                                 02778000
      BUFFER(J) = BUFFER(I)                                             02779000
      J = J + 1                                                         02780000
137   CONTINUE                                                          02781000
139   J = F2 - F1 + 2                                                   02782000
138   IF (J .GT. 80) GO TO 1241                                         02783000
      BUFFER(J) = BLANK                                                 02784000
      J = J + 1                                                         02785000
      GO TO 138                                                         02786000
114   IF (BUFFER(F1) .NE. CPAREN .OR. BUFFER(F1+1) .NE. BLANK) GO TO 136 02787000
      BUFFER(F1) = PREN29                                               02788000
      COVEA = -5                                                        02789000
101   IBUFR = F1                                                        02790000
      IF (FINISH .GT. 0) IBUFR = IBUFSV                                 02791000
      DO 104 IBUFR = IBUFR, F2                                          02792000
      IF (FINISH .EQ. 0) GO TO 140                                      02793000
      BUFCHR = BUFSAV(IBUFR)                                            02794000
      GO TO 141                                                         02795000
140   BUFCHR = BUFFER(IBUFR)                                            02796000
      IF (COVEA .LT. 0) GO TO 127                                       02797000
141   IF (CWORD .GT. DELETE) GO TO 106                                  02798000
C....CWORD = 10 INSIDE COMMAND WORD                                     02799000
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126   IF (BUFCHR .EQ. CPAREN) GO TO 107                                    02800000
      IF (BUFCHR .EQ. BLANK) GO TO 108                                     02801000
130   IF (BFOUND .EQ. 0) GO TO 109                                         02802000
      WORDS = WORDS + 1                                                    02803000
      IF (NODOC .EQ. (-30)) STABLE(WORDS) = IBUFR                          02804000
      IF (WORDS .NE. INSWRD) GO TO 129                                     02805000
      REMNNT = 10                                                          02806000
      IBUFSV = IBUFR                                                       02807000
      IF (FINISH .NE. 0) GO TO 100                                         02808000
      DO 131 I = 1, 80                                                     02809000
      BUFSAV(I) = BUFFER(I)                                                02810000
131   CONTINUE                                                             02811000
      GO TO 100                                                            02812000
129   BFOUND = 0                                                           02813000
109   IF (DELETE .NE. 0) GO TO 104                                         02814000
      IF (NODOC .LT. 0) GO TO 123                                          02815000
      BUFO(BUFPT) = BFCR                                                   02816000
      BUFPT = BUFPT + 1                                                    02817000
      IF (BUFPT .GT. 80) GO TO 110                                         02818000
      IF (COVEA .EQ. 0) GO TO 104                                          02819000
      DO 115 J = BUFPT, 80                                                 02820000
115   BUFO(J) = BL                                                         02821000
110   WRITE (IREAD,FMTIN)                                                  02822000
      BUFPT = 1                                                            02823000
123   IF (COVEA) 103,104,132                                               02824000
C....FLAG BAD COMMAND OPERANDS DURING EDIT                                 02825000
106   IF (BUFCHR .LT. A) GO TO 1061                                        02826000
      IF (BUFCHR .LT. 0) GO TO 1062                                        02827000
      IF (BUFCHR .EQ. BLANK) GO TO 1062                                    02828000
      IF (BUFCHR .EQ. CENTS) GO TO 1062                                    02829000
C....FLAG ERROR ONLY IF EDITING, SKIP IF 'CREATE' OR 'LIST'                02830000
1061  IF (K .GE. 0) CALL MSG(700)                                          02831000
1062  IF (NODOC .NE. (-30) .OR. COPPTR .GT. 36) GO TO 135                  02832000
      COPS(COPPTR) = BUFCHR                                                02833000
      COPPTR = COPPTR + 1                                                  02834000
135   IF (TITLEX .NE. 0) GO TO 112                                         02835000
C....TITLEX = 10 INSIDE TITLE/FOOTER                                       02836000
      IF (BUFCHR .NE. A) GO TO 128                                         02837000
      COVEA = 5                                                            02838000
      GO TO 127                                                            02839000
128   IF (BUFCHR .EQ. V) GO TO 111                                         02840000
112   IF (BUFCHR .NE. E) GO TO 126                                         02841000
      IF (TITLEX .NE. 0) GO TO 134                                         02842000
      IF (MERGE .EQ. -20) BUFCHR = V                                       02843000
      CPAREN = PREN29                                                      02844000
      F1 = 1                                                               02845000
      F2 = 80                                                              02846000
134   TITLEX = 0                                                           02847000
111   COVEA = 10                                                           02848000
      GO TO 127                                                            02849000
107   BUFCHR = PREN29                                                      02850000
      BUFFER(IBUFR) = PREN29                                               02851000
      IF (BFOUND .GT. DELETE .AND. WORDS .LT. (INSWRD - 1)) CWORD = 10     02852000
      GO TO 130                                                            02853000
108   IF (BFOUND .NE. 0) GO TO 104                                         02854000
127   BFOUND = 10                                                          02855000
      CWORD = 0                                                            02856000
      GO TO 109                                                            02857000
103   COVEA = 0                                                            02858000
104   CONTINUE                                                             02859000
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132   IF (FINISH .NE. 0) REMNNT = 0                                          02860000
100   RETURN                                                                 02861000
C....COVEA = 10 ROUTINE                                                      02862000
102   CALL CCRDR (VAR)                                                       02863000
      DO 113 J = 1, 6                                                        02864000
      IF (NAME .EQ. VV(J)) GO TO (116,117,118,119,120,120), J                02865000
C....                                GO CAR 026 029 TIT FOO                  02866000
113   CONTINUE                                                               02867000
      DO 133 J = 7, 47                                                       02868000
      IF (NAME .EQ. VV(J)) GO TO 124                                         02869000
133   CONTINUE                                                               02870000
      IF (NAME .LT. 0) NAME = 0                                              02871000
      GO TO 116                                                              02872000
120   TITLEX = 10                                                            02873000
116   COVEA = 0                                                              02874000
124   IF (J .NE. 45) GO TO 1241                                              02875000
C....TAKE CARE OF CONTROL CARD WIDTH FOR CCRDR ROUTINE                       02876000
      EDCCWI = VAR1                                                          02877000
      IF (VAR1 .LE. 6  .OR.  VAR1 .GT. 80) EDCCWI = 80                       02878000
1241  IF (NODOC .LT. 0) GO TO 100                                            02879000
      WRITE (IREAD,2000) (BUFFER(JUNK), JUNK = 1, EDCCWI)                    02880000
2000  FORMAT (80A1)                                                          02881000
      GO TO 100                                                              02882000
117   IF (VAR2 .NE. 0) GO TO 121                                             02883000
      VAR2 = VAR1                                                            02884000
      VAR1 = 1                                                               02885000
121   IF (VAR1 .LT. 1 .OR. VAR2 .GT. 80 .OR. (VAR1 + 2) .GT. VAR2 .OR.       02886000
     * IREAD .EQ. 4) GO TO 100                                               02887000
      F1 = VAR1                                                              02888000
      F2 = VAR2                                                              02889000
      GO TO 100                                                              02890000
118   IF (IREAD .EQ. 2) CPAREN = PREN26                                      02891000
      GO TO 100                                                              02892000
119   CPAREN = PREN29                                                        02893000
      GO TO 100                                                              02894000
C*************** ROUTINE FOR EOF ON INPUT VOLUME ************************02895000
105   IF (BUFPT .EQ. 1) GO TO 122                                            02896000
      WRITE (IREAD,FMTIN)                                                    02897000
122   IF (MERGE .NE. 0) GO TO 100                                            02898000
      ENDFILE IREAD                                                          02899000
      REWIND IREAD                                                           02900000
      CPAREN = PREN29                                                        02901000
      GO TO 100                                                              02902000
      END                                                                    02903000
C                                                                            02904000
C                                                                            02905000
C                                                                            02906000
      SUBROUTINE CCRDR (VAR)                                                 02907000
      IMPLICIT INTEGER*4 (A - Z)                                             02908000
      INTEGER*2 BUFFER(80),BUFCHR,NINE,ZERO,VAR(8)                           02909000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,           02910000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                            02911000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                     02912000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,                 02913000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,         02914000
     * CIINC,DICT,NEXT,HIT,                                                  02915000
     * ARRAY1(3),                                                            02916000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                   02917000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                      02918000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW02919000
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     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,02920000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,02921000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,02922000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,02923000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),        02924000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,   02925000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTH,CS,ENDSAV,ID1,LINEW, 02926000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),           02927000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                        02928000
      COMMON /EHRMAN/ DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF,   02929000
     *                BACKWD, BAKPOS, BACHAR, BACKST, BACKND, NULLSW,   02930000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                    02931000
      INTEGER*2 DARKER, DROPCH, BACKCH, BACKFL, BACKCT, BAXPTF, NULLSW, 02932000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,   02933000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                    02934000
      LOGICAL*1 BACHAR(100)                                             02935000
      EQUIVALENCE (BUFFER(1),LINEX(1)),(NINE,NUM(10)),(ZERO,NUM(7))     02936000
      DO 200 I = 1, 8                                                   02937000
200   VAR(I) = 0                                                        02938000
      K = 0                                                             02939000
      NAME = 0                                                          02940000
      DO 282 I = 1, EDCCWI                                              02941000
      BUFCHR = BUFFER(I)                                                02942000
      IF (BUFCHR .EQ. BLANK) GO TO 282                                  02943000
      IF (K .EQ. 0) EDCOL1 = BUFCHR                                     02944000
C....SAVE CHARACTER FOR DOLLAR TEST - AVOID HOMONYMS DURING EDIT        02945000
      K = K + 1                                                         02946000
      NAME = 16 * NAME + (BUFCHR - 3648) / 256                          02947000
C....THE ABOVE IS CODE DEPENDENT                                        02948000
      IF (K .EQ. 3) GO TO 285                                           02949000
282   CONTINUE                                                          02950000
285   K = 1                                                             02951000
280   ASSIGN 284 TO HIT1                                                02952000
284   IF (I .GE. EDCCWI)  GO TO 289                                     02953000
      I = I + 1                                                         02954000
      BUFCHR = BUFFER(I)                                                02955000
      IF (BUFCHR .LE. NINE .AND. BUFCHR .GE. ZERO) GO TO 288            02956000
      GO TO HIT1, (284,291)                                             02957000
291   IF (K .EQ. 8) GO TO 289                                           02958000
      K = K + 1                                                         02959000
      GO TO 280                                                         02960000
288   VAR(K) = 10 * VAR(K) + (BUFCHR + 4032) / 256                      02961000
C....THE ABOVE IS CODE DEPENDENT                                        02962000
      ASSIGN 291 TO HIT1                                                02963000
      GO TO 284                                                         02964000
289   RETURN                                                            02965000
      END                                                               02966000
C                                                                       02967000
C                                                                       02968000
C                                                                       02969000
      SUBROUTINE ENDJOB                                                 02970000
C******************** ROUTINE FOR END OF JOB STREAM **********************02971000
      IMPLICIT INTEGER*4 (A - Z)                                        02972000
      INTEGER*4 LINE1(35), OUTFMT(3) /'(133H     ) '/                   02973000
      INTEGER*2 OVRRDE,F1,F2,CWORD,TITLEX,BUFPT                         02974000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      02975000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        02976000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        02977000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                02978000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            02979000
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      * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     02980000
      * CIINC,DICT,NEXT,HIT,                                              02981000
      * OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,                                  02982000
      * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,               02983000
      * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                  02984000
       COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         02985000
      * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK              02986000
       COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW02987000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N, 02988000
      * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,PPLN,NOGO,NAME,SWK028,IIU, 02989000
      * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX, 02990000
      * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN, 02991000
      * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         02992000
      * INDARR(8),PLN,ICINC,PARA,TPLN,USTART,PCM,SWWPT,ENDL,EWX,PIVOT,    02993000
      * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  02994000
      * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            02995000
      * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                         02996000
       IF (IREAD .NE. 5) REWIND IREAD                                    02997000
       F1 = 1                                                            02998000
       F2 = 80                                                           02999000
       CWORD = 0                                                         03000000
       IF (IWRITE .EQ. 6) GO TO 700                                      03001000
       IF (NODOC .EQ. 0) ENDFILE IWRITE                                  03002000
705    IF (COPIES .EQ. 0) GO TO 700                                      03003000
       COPIES = COPIES - 1                                               03004000
       LINE1(1) = OUTFMT(1)                                              03005000
       LINE1(2) = OUTFMT(2)                                              03006000
       LINE1(35) = OUTFMT(3)                                             03007000
       REWIND IWRITE                                                     03008000
701    READ (IWRITE,LINE1,END=705)                                       03009000
       WRITE (6,LINE1)                                                   03010000
       GO TO 701                                                         03011000
700    IF (LOCATE .EQ. 0) GO TO 702                                      03012000
C.....ALL VALUES IN /C/ WILL NOW BE DESTROYED.                           03013000
       CALL LOC1                                                         03014000
       CALL LOC2                                                         03015000
       CALL LOC3                                                         03016000
702    IF (LIST .EQ. 0) GO TO 703                                        03017000
       IF (OMLIST .NE. 0) GO TO 703                                      03018000
       CALL LISTER                                                       03019000
703    IF (DICT .EQ. 0) STOP                                             03020000
C.....ALL VALUES IN /C/ WILL NOW BE DESTROYED.                           03021000
       CALL PREVNT                                                       03022000
       CALL DICTNY                                                       03023000
C.....IREAD = 3 NOW.                                                     03024000
       RETURN                                                            03025000
       END                                                               03026000
C                                                                        03027000
C                                                                        03028000
C                                                                        03029000
       SUBROUTINE LISTER                                                 03030000
       IMPLICIT INTEGER*4 (A - Z)                                        03031000
       DIMENSION COPSD(18),STABLE(40),TEXT2(20),COPS(9),FMTO(2),FMTOU(22)03032000
       LOGICAL*1 TEXT1(116),DG1,DG2,BUFFR(81),SVMSK                      03033000
       INTEGER*2 TITLEX,BUFFER(80),DIG1,DIG2,BUF(116),CSIGN,EXPT,ASTRSK, 03034000
      * ZERO,NINE                                                        03035000
       INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      03036000
      * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        03037000
       INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        03038000
       INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                03039000
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      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,                03040000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,         03041000
     * CIINC,DICT,NEXT,HIT,                                                  03042000
     * ARRAY1(3),                                                            03043000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                   03044000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                      03045000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),             03046000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                  03047000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUMD,TW03048000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03049000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03050000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWK,03051000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03052000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         03053000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,    03054000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  03055000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            03056000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                         03057000
      DATA BLBL/'     '/,ASTRSK/'* '/,XIMNO/1/,XLNNO/62/,FMTO/'(82H  ) '/03058000
      EQUIVALENCE (LINEX(1),BUFFER(1),BUF(1),TEXT1(1),TEXT2(1),FMTOU(1))03059000
     *,(LINEX(3),BUFFR(4)),(LINEX(21),COPS(1)),(LINEX(41),COPSD(1)),    03060000
     * (DG1,DIG1),(DG2,DIG2),(SVMSK,SAVMSK),(CSIGN,SPCHAR(34)),(EXPT,    03061000
     * SPCHAR(42)),(ZERO,NUM(7)),(STABLE(1),CARD(1)),(NINE,NUM(10)),     03062000
     * (TITLEX,ARRAY1(3))                                                03063000
      DATA XLNPP /60/                                                    03064000
      NODOC = -30                                                        03065000
      INSWRD = 10000                                                     03066000
      COVEA = 10                                                         03067000
      BFOUND = 10                                                        03068000
      TITLEX = 0                                                         03069000
      ASSIGN 713 TO BR3                                                  03070000
      IF (SAVMSK .EQ. 0) ASSIGN 715 TO BR3                               03071000
      PAGENO = 0                                                         03072000
703   READ (IREAD,2002,END=702) BUFFER                                   03073000
2002  FORMAT (80A1)                                                      03074000
      IF (XLNNO .LE. XLNPP) GO TO 704                                    03075000
      PAGENO = PAGENO + 1                                                03076000
      WRITE (6,2001) PAGENO                                              03077000
2001  FORMAT ('1',32X,15HINPUT TO FORMAT,37X,'CARD IMAGE  COMMAND OPERAN03078000
     *DS',6X,'PAGE',I4/)                                                 03079000
      XLNNO = 3                                                          03080000
704   IF (PUNCH .EQ. 0) GO TO 706                                        03081000
      WRITE (7,2002) BUFFER                                              03082000
706   XLNNO = XLNNO + 1                                                  03083000
      DO 708 XI = 1, 18                                                  03084000
708   COPSD(XI) = BLBL                                                   03085000
      CALL CONDSE (0)                                                    03086000
      DO 700 XI = 1, 116                                                 03087000
      DIG1 = BUF(XI)                                                     03088000
      GO TO BR3,(713,715)                                                03089000
715   IF (DIG1 .LT. 0) GO TO 713                                         03090000
      IF (DIG1 .EQ. CSIGN) GO TO 714                                     03091000
      IF (DIG1 - EXPT) 712,714,712                                       03092000
713   IF (DIG1 .NE. KEY028) GO TO 712                                    03093000
714   DIG1 = ASTRSK                                                      03094000
712   TEXT1(XI) = DG1                                                    03095000
700   CONTINUE                                                           03096000
      WRITE (6,2003) TEXT2,XIMNO,COPS                                    03097000
2003  FORMAT (' ',20A4,4X,I7,5X,9A4)                                     03098000
      XIMNO = XIMNO + 1                                                  03099000
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      IF (WORDS .EQ. 0) GO TO 703                                       03100000
      DO 707 XI = 2, 21                                                 03101000
707   FMTOU(XI) = BLBL                                                  03102000
      FMTOU(1) = FMTO(1)                                                03103000
      FMTOU(22) = FMTO(2)                                               03104000
C....FROM THIS POINT TILL LABEL 709 THE PROGRAM IS HIGHLY CODE-DEPENDENT03105000
      DIG1 = ZERO                                                       03106000
      DIG2 = ZERO                                                       03107000
      DO 709 XI = 1, WORDS                                              03108000
      XJ = STABLE(XI)                                                   03109000
      DIG2 = DIG2 + 256                                                 03110000
      IF (DIG2 .LE. NINE) GO TO 710                                     03111000
      DIG1 = DIG1 + 256                                                 03112000
      DIG2 = ZERO                                                       03113000
710   IF (DIG1 .EQ. ZERO) GO TO 711                                     03114000
      BUFFR(XJ) = DG1 - SVMSK                                           03115000
      XJ = XJ + 1                                                       03116000
711   BUFFR(XJ) = DG2 - SVMSK                                           03117000
709   CONTINUE                                                          03118000
      WRITE (6,FMTOU)                                                   03119000
      XLNNO = XLNNO + 1                                                 03120000
      GO TO 703                                                         03121000
702   REWIND IREAD                                                      03122000
      RETURN                                                            03123000
      END                                                               03124000
C                                                                       03125000
C                                                                       03126000
C                                                                       03127000
      SUBROUTINE PREVNT                                                 03128000
      IMPLICIT INTEGER*4 (A - Z)                                        03129000
      DIMENSION WLX(338)                                                03130000
      INTEGER*2 PREVNX(517),PREVN2(516),PREVN3(518),LTR,R,LTR1,         03131000
     * LTR2,II,WL(8285),WLL(8284),WLC(8283)                            03132000
C....WL, WLL, WLC MAY BE DIMENSIONED THE SAME AS IN DICTNY, IF NECESSARY03133000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      03134000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                       03135000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                03136000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            03137000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,    03138000
     * CIINC,DICT,NEXT,HIT,                                            03139000
     * ARRAY1(3),                                                      03140000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,             03141000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                03142000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,IW03143000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03144000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03145000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03146000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03147000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),        03148000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,   03149000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW, 03150000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),           03151000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                       03152000
      INTEGER*2 PR1(100), PR2(100), PR3(100), PR4(100), PR5(17)         03153000
      EQUIVALENCE (PREVNX(101),PR1(1)), (PREVNX(201),PR2(1)),           03154000
     *            (PREVNX(301),PR3(1)), (PREVNX(401),PR4(1)),           03155000
     *            (PREVNX(501),PR5(1))                                  03156000
      DATA FLTR/1/,INC/4/,R/'R '/,II/'I '/,LIMIT/517/                   03157000
C.....LIMIT = SIZE OF PREVNX, PREVN2 = SIZE - 1, PREVN3 = SIZE + 1      03158000
C.....PREVNX WORDS MUST BE IN DESCENDING ALPHABETICAL ORDER             03159000
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      DATA PREVNX/'W O U L D   W I T H O U T   W I T H I N   W I T H   W03160000
     * I L L   W H I C H   W H E T H E R   W H E R E   W H E N E V E R  03161000
     * W H E N   W H A T   W E R E   W A S   V E R Y   T W O   T O O   T03162000
     * H U S   T H R '/                                                 03163000
      DATA PR1                                                         03164000
     *             /'O U G H   T H O U G H   T H O S E   T H I S   T H E03165000
     * Y   T H E S E   T H E R E F O R E   T H E R E   T H E N   T H E M03166000
     *   T H E I R   T H E   T H A T   T H A N   S U C H   S O M E   S I03167000
     * N C E   S H O U '/                                               03168000
      DATA PR2                                                         03169000
     *             / 'L D   S H A L L   S A Y S   S A Y   S A M E   S A03170000
     * I D   P E R   O T H E R   O N L Y   O N E   N O W   N O T   M U S03171000
     * T   M U C H   M O R E   M A Y   M A N Y   I T S   I N T O   H O W03172000
     * E V E R   H O W   '/                                             03173000
      DATA PR3                                                         03174000
     *             /   'H E R E   H A V E   H A S   H A D   F R O M   F03175000
     * O R   F I R S T   E V E R Y   E T C   E I T H E R   E A C H   D U03176000
     * R I N G   D O N E   D O E S   D I D   C O U L D   C A N N O T   C03177000
     * A N   B U T   B O T '/                                           03178000
      DATA PR4                                                         03179000
     *                 / 'H   B E T W E E N   B E I N G   B E F O R E  03180000
     * B E E N   B E C A U S E   A R E   A N Y   A N O T H E R   A N D  03181000
     * A M O N G   A L W A Y S   A L T H O U G H   A L S O   A L M O S T03182000
     *   A L L   A G A I N   '/                                         03183000
      DATA PR5                                                         03184000
     *                   /   'A F T E R   A B O U T   A B L E   '/     03185000
      EQUIVALENCE (PREVN2(1),PREVNX(2)),                               03186000
     * (PREVN3(2),PREVNX(1)),(R,PREVN3(1)),(WL(1),ALT),(WLX(1),WL(1)),  03187000
     * (WLL(1),WL(2)),(WLC(1),WL(3))                                    03188000
      DO 100 XI = 1, 338                                               03189000
  100 WLX(XI) = 0                                                      03190000
  101 LTR = PREVNX(INC)                                                03191000
      INC = INC + 1                                                    03192000
      IF (LTR .NE. BLANK) GO TO 101                                    03193000
      LTR1 = PREVNX(FLTR)                                              03194000
      LTR2 = PREVN2(FLTR)                                              03195000
C.....FROM HERE THRU AND INCLUDING LABEL 107 THIS ROUTINE IS CODE-DEPENDT03196000
      IF (LTR2 .LE. R) GO TO 104                                       03197000
      LTR2 = LTR2 - 3840                                               03198000
      GO TO 105                                                        03199000
  104 IF (LTR2 .GT. II) LTR2 = LTR2 - 1792                             03200000
  105 IF (LTR1 .LE. R) GO TO 106                                       03201000
      LTR1 = LTR1 - 3840                                               03202000
      GO TO 107                                                        03203000
  106 IF (LTR1 .GT. II) LTR1 = LTR1 - 1792                             03204000
  107 OVADDR = ((LTR1 * 26) + LTR2 + 433984) / 256                     03205000
      VADDR = WL(OVADDR)                                               03206000
      WL(OVADDR) = NEXT                                                03207000
      WL(NEXT) = VADDR                                                 03208000
      LENGTH = INC - FLTR - 1                                          03209000
      WLL(NEXT) = LENGTH                                               03210000
      WLC(NEXT) = -32767                                               03211000
      DO 111 XI = 3,LENGTH                                             03212000
      WL(NEXT+XI) = PREVN3(FLTR+XI)                                    03213000
  111 CONTINUE                                                         03214000
      NEXT = NEXT + LENGTH + 1                                         03215000
      FLTR = INC                                                       03216000
      INC = INC + 2                                                    03217000
      IF (INC .LT. LIMIT) GO TO 101                                    03218000
      RETURN                                                           03219000
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      END                                                                    03220000
C                                                                            03221000
C                                                                            03222000
C                                                                            03223000
      SUBROUTINE DICTNY                                                      03224000
      IMPLICIT INTEGER*4 (A - Z)                                             03225000
      DIMENSION WLX(338)                                                     03226000
      INTEGER*2 SECTN,RDBUF(80),Z,AA,CSIGN,WORD2(41),WORD(40),INDARH(14)     03227000
     *,R,II,WL(8430),WLL(8429),WLC(8428),UWORD,TITTXT(26),WORD1,LEN(2)       03228000
C....WL CAN BE DIMENSIONED FOR THE FULL /C/, LIMIT = DIMENSION OF WL         03229000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,           03230000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                            03231000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                             03232000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                     03233000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,                 03234000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,         03235000
     * CIINC,DICT,NEXT,HIT,                                                  03236000
     * ARRAY1(3),                                                            03237000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                   03238000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                      03239000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),              03240000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                  03241000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW03242000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03243000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03244000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03245000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03246000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),          03247000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,     03248000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,   03249000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),             03250000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                          03251000
      DATA SECTN/1/,WCNT/0/,R/'R '/,II/'I '/,LIMIT/8430/,UWORD/0/,        03252000
     * WORD1/'  '/,WORD/40*'  '/                                          03253000
      DATA TITTXT/'W O R D   O C C U R R E N C E   D I C T I O N A R Y '03254000
     */                                                                  03255000
      EQUIVALENCE (Z,NUM(6)),(AA,NUM(1)),(CSIGN,SPCHAR(34)),             03256000
     * (WORD2(2),WORD(1)),(WL(1),ALT),(WLX(1),WL(1))                     03257000
     *,(WLL(1),WL(2)),(WLC(1),WL(3)),(WORD1,WORD(41)),(WORD2(1),LEN(2)),03258000
     * (LEN(1),LENGTH),(INDARH(1),INDARR(2))                             03259000
C.....WORD ISOLATING ROUTINE                                             03260000
C.....CODE-DEPENDENT                                                     03261000
      ASSIGN 502 TO BR4                                                  03262000
529   REWIND 1                                                           03263000
C.....ABOVE MUST JUST PRECEDE 520                                        03264000
520   CIINC = 0                                                          03265000
      CICNT = 0                                                          03266000
500   CCOL = 1                                                           03267000
      IF (SECTN .GT. 1) GO TO 525                                        03268000
      READ (IREAD,1001,END=509) RDBUF                                    03269000
1001  FORMAT (80A1)                                                      03270000
525   DO 501 CCOL = CCOL, 80                                             03271000
      CARDIC = RDBUF(CCOL)                                               03272000
      GO TO BR4, (503,502,516,526)                                       03273000
C.....502 FINDS THE FIRST LETTER OF EACH WORD                            03274000
502   IF (CARDIC .LE. Z .AND. CARDIC .GE. AA .AND. CARDIC .NE. KEY028)   03275000
     * GO TO 504                                                         03276000
      IF (CARDIC .EQ. CPAREN) ASSIGN 516 TO BR4                          03277000
      GO TO 501                                                          03278000
C.....516 SKIPS THE REST OF EACH COMMAND WORD (CPAREN ALREADY SKIPPED)   03279000
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516   IF (CARDIC .EQ. BLANK .OR. CARDIC .EQ. KEY028) ASSIGN 502 TO BR4  03280000
      GO TO 501                                                         03281000
C....503 PLACES EACH VALID WORD INTO 'WORD'                             03282000
503   IF (CARDIC .LE. Z .AND. CARDIC .GE. AA .AND. CARDIC .NE. KEY028)  03283000
     * GO TO 506                                                       03284000
      IF (CARDIC - CSIGN) 507,501,507                                   03285000
C....INTERNAL CENTS SIGN ALLOWED, AS IN MC¢COY, BUT NOT LISTED          03286000
504   ASSIGN 503 TO BR4                                                 03287000
      LENGTH = 1                                                        03288000
      GO TO 505                                                         03289000
526   READ (1,1000,END=527) WORD2                                       03290000
1000  FORMAT (55X,A2,40A1)                                              03291000
      CICNT = CICNT + 1                                                 03292000
      GO TO 521                                                         03293000
506   LENGTH = LENGTH + 1                                               03294000
505   WORD(LENGTH) = CARDIC                                             03295000
      IF (LENGTH .LT. 40) GO TO 501                                     03296000
507   ASSIGN 502 TO BR4                                                 03297000
      WCNT = WCNT + 1                                                   03298000
      IF (LENGTH .LE. 2) GO TO 501                                      03299000
C....WORDS LISTED ARE 3 TO 40 CHARACTERS LONG AND CONTAIN LETTERS ONLY  03300000
C                                                                       03301000
C....WORD MATCHING AND ALPHABETIZING ROUTINE                            03302000
C....CODE-DEPENDENT                                                     03303000
      IF (WORD(2) .LE. R) GO TO 518                                     03304000
      WORD(2) = WORD(2) - 3840                                          03305000
      GO TO 519                                                         03306000
518   IF (WORD(2) .GT. II) WORD(2) = WORD(2) - 1792                     03307000
519   IF (WORD(1) .LE. R) GO TO 522                                     03308000
      WORD(1) = WORD(1) - 3840                                          03309000
      GO TO 521                                                         03310000
522   IF (WORD(1) .GT. II) WORD(1) = WORD(1) - 1792                     03311000
521   OVADDR = ((WORD(1) * 26) + WORD(2) + 433984) / 256                03312000
      VADDR = WL(OVADDR)                                                03313000
      GO TO 515                                                         03314000
512   OVADDR = VADDR                                                    03315000
      VADDR = NVADDR                                                    03316000
515   IF (VADDR .EQ. 0) GO TO 510                                       03317000
      NVADDR = WL(VADDR)                                                03318000
      COMPAR = WLL(VADDR)                                               03319000
      IF (COMPAR .GT. LENGTH) COMPAR = LENGTH                           03320000
      DO 511 XI = 3, COMPAR                                             03321000
      IF (WL(VADDR+XI) - WORD(XI)) 512,511,510                          03322000
511   CONTINUE                                                          03323000
      IF (WLL(VADDR) - LENGTH) 512,514,510                              03324000
514   WLC(VADDR) = WLC(VADDR) + 1                                       03325000
C....THE WORD MATCHES THE COMPARAND                                     03326000
      GO TO 501                                                         03327000
C....WL TABLE CANNOT CONTAIN PRESENT WORD                               03328000
508   IF (CIINC .EQ. 0) CIINC = CICNT + 5                               03329000
      IF (SECTN .GT. 1) GO TO 501                                       03330000
      WRITE (1,1000) WORD2                                              03331000
      GO TO 501                                                         03332000
510   IF (NEXT + LENGTH .GE. LIMIT) GO TO 508                           03333000
      WL(OVADDR) = NEXT                                                 03334000
      WL(NEXT) = VADDR                                                  03335000
      WLL(NEXT) = LENGTH                                                03336000
      WLC(NEXT) = 1                                                     03337000
      DO 513 XI = 3, LENGTH                                             03338000
      WL(NEXT+XI) = WORD(XI)                                            03339000
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513   CONTINUE                                                          03340000
      NEXT = NEXT + LENGTH + 1                                          03341000
501   CONTINUE                                                          03342000
      GO TO 500                                                         03343000
C                                                                       03344000
C....ROUTINE FOR WRITING RESULTS                                        03345000
C....CODE-DEPENDENT                                                     03346000
509   REWIND 3                                                          03347000
      REWIND IREAD                                                      03348000
      ENDFILE 1                                                         03349000
527   WORD(1) = 0                                                       03350000
      DO 551 PTR = 1, 676                                               03351000
      VADDR = WL(PTR)                                                   03352000
      IF (VADDR .EQ. 0) GO TO 551                                       03353000
      XI = WORD(1)                                                      03354000
      WORD(1) = AA + (((PTR - 1) / 26) * 256)                           03355000
      IF (WORD(1) .GT. II) WORD(1) = WORD(1) + 1792                     03356000
      WORD(2) = AA + (MOD(PTR-1,26) * 256)                              03357000
      IF (WORD(2) .GT. II) WORD(2) = WORD(2) + 1792                     03358000
      IF (WORD(2) .GT. R) WORD(2) = WORD(2) + 2048                      03359000
      IF (WORD(1) .GT. R) WORD(1) = WORD(1) + 2048                      03360000
      IF (XI .EQ. WORD(1)) GO TO 554                                    03361000
      IF (COUNT .LE. 0) GO TO 554                                       03362000
      WRITE (3,1004) WORD(1)                                            03363000
1004  FORMAT (' )LW3M ',A1,' )MLL',67X)                                 03364000
554   IF (WLC(VADDR) .LE. 0) GO TO 528                                  03365000
      LENGTH = WLL(VADDR)                                               03366000
      UWORD = UWORD + 1                                                 03367000
      DO 550 XJ = 3, LENGTH                                             03368000
      WORD(XJ) = WL(VADDR+XJ)                                           03369000
550   CONTINUE                                                          03370000
552   LENGTH = LENGTH + 1                                               03371000
C....WORD(41) IS INITIALIZED IN DATA STATEMENT TO BLANK VIA WORD1        03372000
      IF (WORD(LENGTH) .EQ. BLANK) GO TO 553                            03373000
      WORD(LENGTH) = BLANK                                              03374000
      GO TO 552                                                         03375000
553   WRITE (3,1003) WORD,WLC(VADDR)                                    03376000
1003  FORMAT (' )H ',40A1,I4,' )HL',28X)                                03377000
528   VADDR = WL(VADDR)                                                 03378000
      IF (VADDR .NE. 0) GO TO 554                                       03379000
551   CONTINUE                                                          03380000
      IF (CIINC .EQ. 0) GO TO 524                                       03381000
      ASSIGN 526 TO BR4                                                 03382000
      SECTN = SECTN + 1                                                 03383000
      WRITE (3,1005) SECTN                                              03384000
1005  FORMAT (' )SU SECTION',I4,': )UC',59X)                            03385000
      DO 517 XI = 1, 338                                                03386000
517   WLX(XI) = 0                                                       03387000
      NEXT = 677                                                        03388000
      IF (SECTN .EQ. 2) GO TO 529                                       03389000
      CIINC = CIINC - 5                                                 03390000
      DO 523 XI = CIINC, CICNT                                          03391000
      BACKSPACE 1                                                       03392000
523   CONTINUE                                                          03393000
      GO TO 520                                                         03394000
524   WRITE (3,1002) WCNT,UWORD                                         03395000
1002  FORMAT (' )CH',I7,' WORDS/STRINGS )HLH',I6,' WORDS LISTED )E',28X)03396000
C                                                                       03397000
C....ROUTINE FOR RE-INITIALIZING PARAMETERS                             03398000
      ENDFILE 3                                                         03399000
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      REWIND 3                                                          03400000
      REWIND 1                                                          03401000
      DO 559 XI = 3, 184                                                03402000
559   WLX(XI) = 0                                                       03403000
C.....SETS VARIABLES IN /C/ FROM 'ITEXT' THRU 'RSIDE' TO ZERO           03404000
      CICNT = 0                                                         03405000
      CIINC = 0                                                         03406000
      DICT = -10                                                        03407000
      FIELD2 = 52                                                       03408000
C.....'CARD FIELD THRU 52' IS IN EFFECT                                 03409000
      IREAD = 3                                                         03410000
      IWRITE = 6                                                        03411000
      NODOC = 0                                                         03412000
      ALT = 1                                                           03413000
      BLNKLN = 1                                                        03414000
      CCGCNT = 0                                                        03415000
      CHARCO = 20                                                       03416000
      COLPAG = 6                                                        03417000
      CSEP = 1                                                          03418000
      FLN = 5                                                           03419000
      ICINC = 1                                                         03420000
      INDARR(1) = 2                                                     03421000
C.....I.E., FIRST INDENT IS 2,0                                         03422000
      LINPAG = 59                                                       03423000
      TLLN = LINPAG                                                     03424000
      LINSIZ = 132                                                      03425000
      LN2 = 2                                                           03426000
      LSIDE = 132                                                       03427000
      LTITLE = 1                                                        03428000
      MASK1 = 0                                                         03429000
      MYPAGE = 1                                                        03430000
      NSYM = 3                                                          03431000
      PAGENO = 1                                                        03432000
      REPTTL = 10                                                       03433000
      SPACNG = 1                                                        03434000
      TEXEND = 7788                                                     03435000
      TFLN = 1                                                          03436000
      TWOUP = 1                                                         03437000
      TXTLNE = 3                                                        03438000
      DO 555 I = 1, TEXEND                                              03439000
555   PAGDUM(I) = BLANK                                                 03440000
      DO 556 I = 1, 26                                                  03441000
556   PAGDUM(I+53) = TITTXT(I)                                          03442000
      RETURN                                                            03443000
      END                                                               03444000
C                                                                       03445000
C                                                                       03446000
C                                                                       03447000
      SUBROUTINE LOC1                                                   03448000
      IMPLICIT INTEGER*4 (A - Z)                                        03449000
      DIMENSION WLX(352)                                                03450000
      INTEGER*2 LL,BUFFER(80),RECORD,LCHAR,PLUS,LTR1,SLASH,ASTRSK,LCZ,  03451000
     * LTR2,AA,ZZ,R,WL(8430),WLL(8429),WLR(8428),WLS(8426),$,XKX(2),II   03452000
C.....IN LOC1, LOC2, & LOC3 WL CAN BE DIMENSIONED FOR ALL /C/, LIMIT = DM03453000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      03454000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        03455000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                03456000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            03457000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,    03458000
     * CIINC,DICT,NEXT,HIT,                                             03459000
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     * ARRAY1(3),                                                        03460000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              03461000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 03462000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW03463000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03464000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03465000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03466000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03467000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),        03468000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,   03469000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW, 03470000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),           03471000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                        03472000
      DATA PLUS/'+ '/,R/'R '/,II/'I '/,LIMIT/8430/,NXTONE/704/,$/'$ '/, 03473000
     * SLASH/'/ '/,ASTRSK/'* '/,LCZ/ZA940/                              03474000
      EQUIVALENCE (LL,NUM(4)),(AA,NUM(1)),(ZZ,NUM(6)),(WL(1),ALT),     03475000
     * (LTR1,BUFFER(1)),(LTR2,BUFFER(2)),(WL(1),WLX(1)),(WLL(1),WL(2)), 03476000
     * (WLR(1),WL(3)),(WLS(1),WL(5)),(XKX(1),XKIABS)                    03477000
C.....THIS SUBROUTINE IS VERY CODE-SENSITIVE.                           03478000
      REWIND 1                                                          03479000
      REWIND 3                                                          03480000
      DO 102 XI = 1, 352                                                03481000
102   WLX(XI) = 0                                                       03482000
C                                                                       03483000
C.....READ EACH $LOCATE STRING, REDUCE IT, AND PLACE IT IN 'WL'.        03484000
C                                                                       03485000
      DO 100 XI = 1, LOCATE                                             03486000
101   READ (1,1000) RECORD,BUFFER                                       03487000
1000  FORMAT (A1,16X,80A1)                                              03488000
      IF (RECORD .NE. LL) GO TO 101                                     03489000
C.....BUFFER IS NOW LOADED WITH A RECORD TO BE $LOCATED. NOW REDUCE IT. 03490000
      LASTCB = 1                                                        03491000
      XK = 0                                                            03492000
C.....ELIMINATE EXCESS BLANKS FROM PHRASE TO BE $LOCATED.               03493000
      DO 103 XJ = 1, 80                                                 03494000
      LCHAR = BUFFER(XJ)                                                03495000
      IF (LCHAR .NE. BLANK) GO TO 104                                   03496000
      LASTCB = LASTCB + 1                                               03497000
      IF (LASTCB - 1) 103,105,103                                       03498000
104   IF (LCHAR .GT. 0 .AND. LCHAR .NE. HYPHEN .AND. LCHAR .NE. SLASH   03499000
     * .AND. LCHAR .NE. ASTRSK .AND. LCHAR .NE. PLUS .AND. LCHAR .NE. $)03500000
     * GO TO 103                                                        03501000
C.....NON-ALPHAMERIC NOT B-/*+$ IS ELIMINATED FROM PHRASE TO BE $LOCATED.03502000
      LASTCB = 0                                                        03503000
      IF (LCHAR .LE. LCZ) LCHAR = LCHAR + LOWCAS                        03504000
105   XK = XK + 1                                                       03505000
      BUFFER(XK) = LCHAR                                                03506000
103   CONTINUE                                                          03507000
      IF (BUFFER(XK) .EQ. BLANK) XK = XK - 1                            03508000
      IF (BUFFER(XK) .EQ. PLUS) XK = 1 - XK                             03509000
      IF (XK .EQ. 0) GO TO 100                                          03510000
C.....ASSUMES BUFFER(0) .NE. BLANK, ELIMINATES LONE '+' AND 80 BLANKS.  03511000
C.....XK/ = LENGTH OF PHRASE. XK .LT. 0 IF PHRASE IS A PREFIX.          03512000
      XKIABS = IABS(XK)                                                 03513000
      IF (LTR1 .LT. AA .OR. LTR1 .GT. ZZ .OR. LTR2 .LT. AA .OR. LTR2    03514000
     * .GT. ZZ) GO TO 107                                               03515000
      CHAR1 = 3                                                         03516000
      IF (LTR2 .LE. R) GO TO 108                                        03517000
      LTR2 = LTR2 - 3840                                                03518000
      GO TO 109                                                         03519000
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108   IF (LTR2 .GT. II) LTR2 = LTR2 - 1792                              03520000
109   IF (LTR1 .LE. B) GO TO 110                                        03521000
      LTR1 = LTR1 - 3840                                                03522000
      GO TO 111                                                         03523000
110   IF (LTR1 .GT. II) LTR1 = LTR1 - 1792                              03524000
111   OVADDR = ((LTR1 * 27) + LTR2 + 450304) / 256                      03525000
117   VADDR = WL(OVADDR)                                                03526000
      GO TO 113                                                         03527000
C....IF 1ST OR 2ND CHARACTER IS A LETTER, USE IT FOR PLACEMENT POS'N.   03528000
107   CHAR1 = 1                                                         03529000
      IF (LTR1 .LT. AA .OR. LTR1 .GT. ZZ) GO TO 120                     03530000
      JUNKX = LTR1                                                      03531000
      GO TO 121                                                         03532000
120   IF (LTR2 .LT. AA .OR. LTR2 .GT. ZZ) GO TO 124                     03533000
      JUNKX = LTR2                                                      03534000
121   IF (JUNKX .LE. B) GO TO 122                                       03535000
      JUNKX = JUNKX - 3840                                              03536000
      GO TO 123                                                         03537000
122   IF (JUNKX .GT. II) JUNKX = JUNKX - 1792                           03538000
123   OVADDR = (JUNKX * 27 + 433984) / 256                              03539000
      IF (XK .EQ. (-1)) XK = 1                                          03540000
C.....A SINGLE LETTER MAY NOT BE FOLLOWED BY A TERMINAL '+'.            03541000
      GO TO 117                                                         03542000
C.....NEITHER 1ST NOR 2ND CHARACTER IS A LETTER.                        03543000
124   OVADDR = 703                                                      03544000
      GO TO 117                                                         03545000
112   OVADDR = VADDR                                                    03546000
      VADDR = NVADDR                                                    03547000
113   IF (VADDR .EQ. 0) GO TO 114                                       03548000
      NVADDR = WL(VADDR)                                                03549000
      JUNKX = WLL(VADDR)                                                03550000
      COMPAR = IABS(JUNKX)                                              03551000
      IF (COMPAR .GT. XKIABS) COMPAR = XKIABS                           03552000
      IF (COMPAR .LT. CHAR1) GO TO 118                                  03553000
      DO 115 XJ = CHAR1, COMPAR                                         03554000
      IF (WLS(VADDR-CHAR1+XJ) - BUFFER(XJ)) 112,115,114                 03555000
115   CONTINUE                                                          03556000
118   IF (IABS(JUNKX) - XKIABS) 112,125,114                             03557000
125   IF (XK .LT. 0) WLL(VADDR) = XK                                    03558000
      GO TO 100                                                         03559000
114   IF (NXTONE + XKIABS + 5 - CHAR1 .LE. LIMIT) GO TO 106             03560000
      WRITE (6,1003) XI                                                 03561000
1003  FORMAT ('1'/////' TABLE O/F AT $LOCATE STRING NO.',I5)            03562000
      GO TO 303                                                         03563000
106   WL(OVADDR) = NXTONE                                               03564000
      WL(NXTONE) = VADDR                                                03565000
      WLL(NXTONE) = XK                                                  03566000
      WLR(NXTONE) = 0                                                   03567000
      IF (XKIABS .LT. CHAR1) GO TO 119                                  03568000
      DO 116 XJ = CHAR1, XKIABS                                         03569000
      WLS(NXTONE-CHAR1+XJ) = BUFFER(XJ)                                 03570000
116   CONTINUE                                                          03571000
119   NXTONE = NXTONE + XKIABS + 5 - CHAR1                              03572000
100   CONTINUE                                                          03573000
C                                                                       03574000
C....WRITE REDUCED, FILTERED, AND SORTED $LOCATE STRINGS ONTO DRN 1.    03575000
C                                                                       03576000
303   CHAR1 = 3                                                         03577000
      REWIND 1                                                          03578000
      DO 300 XI = 1, 703                                                03579000
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      VADDR = WL(XI)                                                    03580000
      IF (VADDR .EQ. 0) GO TO 300                                       03581000
      LTR1 = AA + (((XI - 1) / 27) * 256)                               03582000
      IF (LTR1 .GT. II) LTR1 = LTR1 + 1792                              03583000
      IF (LTR1 .GT. R) LTR1 = LTR1 + 2048                               03584000
      JUNKX = MOD(XI+25,27)                                             03585000
      IF (JUNKX .NE. 26) GO TO 305                                      03586000
      CHAR1 = 1                                                         03587000
      GO TO 301                                                         03588000
305   CHAR1 = 3                                                         03589000
      LTR2 = AA + JUNKX * 256                                           03590000
      IF (LTR2 .GT. II) LTR2 = LTR2 + 1792                              03591000
      IF (LTR2 .GT. R) LTR2 = LTR2 + 2048                               03592000
301   XK = WLL(VADDR)                                                   03593000
      XKIABS = IABS(XK)                                                 03594000
      IF (XKIABS .LT. CHAR1) GO TO 306                                  03595000
      DO 302 XJ = CHAR1, XKIABS                                         03596000
      BUFFER(XJ) = WLS(VADDR-CHAR1+XJ)                                  03597000
302   CONTINUE                                                          03598000
306   IF (XK .GT. 0) GO TO 304                                          03599000
      XKIABS = XKIABS + 1                                               03600000
      BUFFER(XKIABS) = PLUS                                             03601000
304   WRITE (1,1006) XKX(2),BUFFER                                      03602000
1006  FORMAT (15X,A2,80A1)                                              03603000
      VADDR = WL(VADDR)                                                 03604000
      IF (VADDR .NE. 0) GO TO 301                                       03605000
300   CONTINUE                                                          03606000
      ENDFILE 1                                                         03607000
      REWIND 1                                                          03608000
      RETURN                                                            03609000
      END                                                               03610000
C                                                                       03611000
C                                                                       03612000
C                                                                       03613000
      SUBROUTINE LOC2                                                   03614000
      IMPLICIT INTEGER*4 (A - Z)                                        03615000
      DIMENSION COLLE3(20)                                              03616000
      INTEGER*2 BUFFER(80),PLUS,AA,ZZ,R,WL(8430),WLL(8429),WLR(8428),   03617000
     * WLP(8427),WLS(8426),$,II,CR(81),FLIST(41),CRW1,CRW2,WORDCI(41),   03618000
     * COLLE0(39),COLLE1(38),COLLE2(37),COLLE4(40),SLASH,ASTRSK,30(3),E,03619000
     * V,LCZ                                                            03620000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,      03621000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        03622000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                        03623000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                03624000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,            03625000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     03626000
     * CIINC,DICT,NEXT,HIT,                                             03627000
     * ARRAY1(3),                                                       03628000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,              03629000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                 03630000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),         03631000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK             03632000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW03633000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03634000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03635000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03636000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03637000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         03638000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,    03639000
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     * INDEX,TABSEQ,CHAR,ENDP,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  03640000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            03641000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                         03642000
C....HLIMIT = (WL DIMENSION) / 3 IN LOC2 & LOC3                          03643000
      DATA PLUS/'+ '/,R/'R '/,II/'I '/,$/'$ '/,HLIMIT/2810/,CI/0/,       03644000
     * HITPT/1/,HITREC/1/,SCOUNT/0/,CRPT/1/,ASISX/0/,GO/'G ','O ',0/,    03645000
     * SLASH/'/ '/,ASTRSK/'* '/,LCZ/ZA940/,NXTWRD/1/,WORDNO/0/           03646000
      EQUIVALENCE (WL(1),ALT),(WLL(1),WL(2)),(WLR(1),WL(3)),(WLP(1),     03647000
     * WL(4)),(WLS(1),WL(5)),(COLLE0(1),COLLE4(2)),(COLLE1(1),COLLE0(2)) 03648000
     *,(COLLE2(1),COLLE0(3)),(COLLE4(1),COLLE3(1)),(AA,NUM(1)),          03649000
     * (ZZ,NUM(6)),(E,NUM(2)),(V,NUM(5))                                 03650000
C....THIS SUBROUTINE IS VERY CODE-SENSITIVE.                             03651000
C                                                                        03652000
C....PASS INPUT ACROSS STRINGS TO BE $LOCATED.                           03653000
C                                                                        03654000
C.....LOC1 REWINDS DRNS 1 AND 3. ENDJOB REWINDS IREAD.                   03655000
C.....205 READS CONTROL CARDS, ET AL, UNTIL 'GO' IS FOUND.               03656000
205   ASSIGN 201 TO BR5                                                  03657000
      CCOL = 80                                                          03658000
      FLIST(1) = 1                                                       03659000
      EOF = 0                                                            03660000
211   READ (IREAD,1004,END=207) BUFFER                                   03661000
      CI = CI + 1                                                        03662000
C.....IS THIS RECORD THE 'GO' CARD (OR AN EQUIVALENT), QUESTION MARK.    03663000
      XJ = 0                                                             03664000
      DO 215 XI = 1, 80                                                  03665000
      CARDIC = BUFFER(XI)                                                03666000
      IF (CARDIC .EQ. BLANK) GO TO 215                                   03667000
      XJ = XJ + 1                                                        03668000
      IF (CARDIC .NE. GO(XJ)) GO TO 211                                  03669000
215   CONTINUE                                                           03670000
C.....YES. THIS CONTROL CARD CONTAINS EITHER 'GO', 'G', OR ALL BLANKS.   03671000
      NXTWRD = 0                                                         03672000
      WORDNO = 0                                                         03673000
C.....209 IS THE DYNAMIC ENTRY POINT.                                    03674000
209   NXTWRD = NXTWRD + 1                                                03675000
      IF (NXTWRD .GT. 41) NXTWRD = 1                                     03676000
      CR2 = FLIST(NXTWRD)                                                03677000
      IF (EOF .NE. 0) GO TO 214                                          03678000
200   CCOL = CCOL + 1                                                    03679000
      IF (CCOL .LE. 80) GO TO 206                                        03680000
210   CCOL = 1                                                           03681000
      READ (IREAD,1004) BUFFER                                           03682000
1004  FORMAT (80A1)                                                      03683000
      CI = CI + 1                                                        03684000
      IF (ASISX .EQ. 0) GO TO 206                                        03685000
      ASSIGN 201 TO BR5                                                  03686000
      IF (BUFFER(1) .NE. CPAREN) GO TO 206                               03687000
      CCOL = 2                                                           03688000
      ASISX = 0                                                          03689000
206   CARDIC = BUFFER(CCOL)                                              03690000
      IF (CARDIC .EQ. KEY028) CARDIC = BLANK                             03691000
      GO TO BR5,(201,203,204)                                            03692000
C.....203 SCANS COMMAND WORDS FOR V, E, AND A - OTHERWISE IGNORES THEM.  03693000
203   IF (ASISX .NE. 0) GO TO 213                                        03694000
      IF (CARDIC .EQ. V .OR. CARDIC .EQ. E) GO TO 212                    03695000
      IF (CARDIC .NE. AA) GO TO 213                                      03696000
      ASISX = 10                                                         03697000
      ASSIGN 201 TO BR5                                                  03698000
      GO TO 210                                                          03699000
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213   IF (CARDIC .EQ. BLANK) ASSIGN 201 TO BR5                                  03700000
      GO TO 200                                                                 03701000
C.....201 HANDLES WORD BEGINNINGS.                                              03702000
201   IF (CARDIC .NE. CPAREN) GO TO 202                                         03703000
      ASSIGN 203 TO BR5                                                         03704000
      GO TO 200                                                                 03705000
202   IF (CARDIC .EQ. BLANK) GO TO 200                                          03706000
C.....ELIMINATE EXCESS BLANKS.                                                  03707000
      WORDNO = WORDNO + 1                                                       03708000
      IF (WORDNO .GT. 41) WORDNO = 1                                            03709000
      FLIST(WORDNO) = CRPT                                                      03710000
      WORDCI(WORDNO) = CI                                                       03711000
      ASSIGN 204 TO BR5                                                         03712000
C.....204 INSERTS WORDS INTO THE COMPARE REGISTER (CR).                         03713000
204   IF (CARDIC .GT. 0 .AND. CARDIC .NE. BLANK .AND. CARDIC .NE. HYPHEN03714000
     * .AND. CARDIC .NE. SLASH .AND. CARDIC .NE. ASTRSK .AND. CARDIC             03715000
     * .NE. PLUS .AND. CARDIC .NE. $) GO TO 200                                 03716000
C.....DELETE NON-ALPHAMERICS NOT B-/*+$ (TO AVOID PUNCTUATION MARKS).           03717000
      IF (CARDIC .LE. LCZ) CARDIC = CARDIC + LOWCAS                             03718000
      CR(CRPT) = CARDIC                                                         03719000
      CRPT = CRPT + 1                                                           03720000
      IF (CRPT .GT. 81) CRPT = 1                                                03721000
      IF (CARDIC .EQ. BLANK) ASSIGN 201 TO BR5                                  03722000
      IF (CRPT - CR2) 200,600,200                                               03723000
C.....)V OR )E ENCOUNTERED IN COMMAND WORD.                                     03724000
212   EOF = -10                                                                 03725000
      GO TO 214                                                                 03726000
C.....END-OF-FILE ENCOUNTERED ON TEXT TAPE.                                     03727000
207   EOF = 10                                                                  03728000
      REWIND IREAD                                                              03729000
214   IF (NXTWRD .NE. MOD(WORDNO,41) + 1) GO TO 208                             03730000
      IF (EOF) 205,612,612                                                      03731000
208   CR(CRPT) = BLANK                                                          03732000
      CRPT = CRPT + 1                                                           03733000
      IF (CRPT .GT. 81) CRPT = 1                                                03734000
      IF (CRPT .NE. CR2) GO TO 208                                              03735000
C                                                                               03736000
C.....COMPARE WORD STARTING AT CR(FLIST(NXTWRD)) AGAINST $LOCATE STRINGS.       03737000
C                                                                               03738000
600   W1 = FLIST(NXTWRD)                                                        03739000
      W2 = W1 + 1                                                               03740000
      IF (W2 .GT. 81) W2 = 1                                                    03741000
      CRW1 = CR(W1)                                                             03742000
      CRW2 = CR(W2)                                                             03743000
      IF (CRW1 .GE. AA .AND. CRW1 .LE. ZZ .AND. CRW2 .GE. AA .AND. CRW2 03744000
     * .LE. ZZ) GO TO 601                                                       03745000
      CHAR1 = 1                                                                 03746000
      IF (CRW1 .GE. AA .AND. CRW1 .LE. ZZ) GO TO 613                            03747000
      IF (CRW2 .LT. AA .OR. CRW2 .GT. ZZ) GO TO 614                             03748000
      CRW1 = CRW2                                                               03749000
613   CRW2 = -16320                                                             03750000
C.....'A' - 256 = -16320.                                                       03751000
C.....WL SUBSCRIPT = (27*CRW1-27*'A'+256)/256 = (27*CRW1+433984)/256.           03752000
      GO TO 603                                                                 03753000
614   VADDR = WL(703)                                                           03754000
      GO TO 607                                                                 03755000
601   CHAR1 = 3                                                                 03756000
      IF (CRW2 .LE. R) GO TO 602                                                03757000
      CRW2 = CRW2 - 3840                                                        03758000
      GO TO 603                                                                 03759000
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602   IF (CRW2 .GT. II) CRW2 = CRW2 - 1792                                  03760000
603   IF (CRW1 .LE. R) GO TO 604                                            03761000
      CRW1 = CRW1 - 3840                                                    03762000
      GO TO 606                                                             03763000
604   IF (CRW1 .GT. II) CRW1 = CRW1 - 1792                                  03764000
606   VADDR = WL(((CRW1 * 27) + CRW2 + 450304) / 256)                       03765000
C....WL SUBSCRIPT = (CRW1 * 27 + CRW2 - 28 * 'A' + 512) / 256.              03766000
      GO TO 607                                                             03767000
608   VADDR = NVADDR                                                        03768000
607   IF (VADDR .EQ. 0) GO TO 209                                           03769000
      NVADDR = WL(VADDR)                                                    03770000
      XK = WLL(VADDR)                                                       03771000
      W3 = W1 + CHAR1 - 1                                                   03772000
      IF (W3 .GT. 81) W3 = W3 - 81                                          03773000
      XKIABS = IABS(XK)                                                     03774000
      IF (XKIABS .LT. CHAR1) GO TO 605                                      03775000
      DO 609 XJ = CHAR1, XKIABS                                             03776000
      IF (WLS(VADDR-CHAR1+XJ) - CR(W3)) 608,610,209                         03777000
610   W3 = W3 + 1                                                           03778000
      IF (W3 .GT. 81) W3 = 1                                                03779000
609   CONTINUE                                                              03780000
605   IF (CR(W3) .NE. BLANK .AND. XK .GT. 0) GO TO 608                      03781000
C.....A HIT HAS BEEN MADE.                                                  03782000
      HIT = HIT + 1                                                         03783000
      COLLE0(HITPT) = WORDCI(NXTWRD)                                        03784000
      COLLE1(HITPT) = WLR(VADDR)                                            03785000
      COLLE2(HITPT) = WLP(VADDR)                                            03786000
      WLR(VADDR) = HITREC                                                   03787000
      WLP(VADDR) = HITPT                                                    03788000
      HITPT = HITPT + 3                                                     03789000
      IF (HITPT .LT. 40) GO TO 611                                          03790000
      HITPT = 1                                                             03791000
      WRITE (3,1002) COLLE3                                                 03792000
1002  FORMAT (20A4)                                                         03793000
      HITREC = HITREC + 1                                                   03794000
611   IF (HIT .LT. HLIMIT) GO TO 608                                        03795000
      HIT = 0                                                               03796000
      HITREC = 1                                                            03797000
612   IF (HITPT .EQ. 1) GO TO 500                                           03798000
      WRITE (3,1002) COLLE3                                                 03799000
      HITPT = 1                                                             03800000
C                                                                           03801000
C.....WRITE THE INDEX RECORDS ONTO DRN 3. ALSO ZERO OUT WLR(OVADDR).        03802000
C                                                                           03803000
500   DO 502 XJ = 1, 703                                                    03804000
      OVADDR = WL(XJ)                                                       03805000
C.....DO NOT USE VADDR OR NVADDR WHICH HAVE VALUES NEEDED IF SECTN .GT. 1   03806000
501   IF (OVADDR .EQ. 0) GO TO 502                                          03807000
      COLLE4(HITPT) = WLR(OVADDR)                                           03808000
      COLLE0(HITPT) = WLP(OVADDR)                                           03809000
      WLR(OVADDR) = 0                                                       03810000
      OVADDR = WL(OVADDR)                                                   03811000
      HITPT = HITPT + 2                                                     03812000
      IF (HITPT .LT. 41) GO TO 501                                          03813000
      HITPT = 1                                                             03814000
      WRITE (3,1002) COLLE3                                                 03815000
      GO TO 501                                                             03816000
502   CONTINUE                                                              03817000
      IF (HITPT .EQ. 1) GO TO 503                                           03818000
      WRITE (3,1002) COLLE3                                                 03819000
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      HITPT = 1                                                          03820000
503   SCOUNT = SCOUNT + 1                                                03821000
      IF (EOF .NE. 10 .OR. NXTWRD .NE. MOD(WORDNO,41) + 1) GO TO 608     03822000
      ENDFILE 3                                                          03823000
      REWIND 3                                                           03824000
      HIT = (SCOUNT - 1) * HLIMIT + HIT                                  03825000
      RETURN                                                             03826000
      END                                                                03827000
C                                                                        03828000
C                                                                        03829000
C                                                                        03830000
      SUBROUTINE LOC3                                                    03831000
      IMPLICIT INTEGER*4 (A - Z)                                         03832000
      DIMENSION COLLE3(20)                                               03833000
      INTEGER*2 BUFFER(80),WL(8430),WLL(8429),WLR(8428),XKX(2),          03834000
     * COLLE0(39),COLLE4(40),LHREC(3),LHPOS(3),CIHIT(21)                 03835000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,       03836000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        03837000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                 03838000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,             03839000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     03840000
     * CIINC,DICT,NEXT,HIT,                                              03841000
     * ARRAY1(3),                                                        03842000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,               03843000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                  03844000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW03845000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03846000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,03847000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03848000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03849000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),         03850000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,    03851000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,  03852000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),            03853000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                         03854000
      DATA HLIMIT/2810/,SECTN/0/,LNZ/57/,PGE/0/                          03855000
      EQUIVALENCE (WL(1),ALT),(WLL(1),WL(2)),(WLR(1),WL(3)),(XKX(1),     03856000
     * XKIABS),(COLLE0(1),COLLE4(2)),(COLLE4(1),COLLE3(1))               03857000
C                                                                        03858000
C.....READ HIT COLLECTION RECORDS FROM DRN 3 FOR THE (SECTN)TH SECTION.  03859000
C                                                                        03860000
504   SECTN = SECTN + 1                                                  03861000
      JUNKX = HIT                                                        03862000
      IF (HIT .GT. HLIMIT) JUNKX = HLIMIT                                03863000
      HIT = HIT - JUNKX                                                  03864000
      JUNKX = JUNKX * 3                                                  03865000
      IF (JUNKX .NE. 0) READ (3,1005) (WL(XI), XI = 1, JUNKX)            03866000
1005  FORMAT (2X,39A2)                                                   03867000
C                                                                        03868000
C.....WRITE THE FORMATED FINAL RESULTS ONTO DRN 6.                       03869000
C                                                                        03870000
      XKX(1) = 0                                                         03871000
C.....READ AN INDEX RECORD (20 ENTRIES PER RECORD).                      03872000
505   READ (3,1002,END=517) COLLE3                                       03873000
      DO 515 HITPT = 1, 39, 2                                            03874000
      READ (1,1006,END=516) XKX(2),BUFFER                                03875000
      ASSIGN 507 TO BR5                                                  03876000
      GO TO 700                                                          03877000
1002  FORMAT (20A4)                                                      03878000
1006  FORMAT (15X,A2,80A1)                                               03879000
```

```
507   WRITE (6,1008) (BUFFER(XJ), XJ = 1, XKIABS)                    03880000
1008  FORMAT (' ',80A1)                                              03881000
      LHREC(1) = COLLE4(HITPT)                                        03882000
      IF (LHREC(1) .GT. 0) GO TO 511                                  03883000
      WRITE (6,1009)                                                  03884000
1009  FORMAT ('+',83X,'NOT FOUND')                                    03885000
      GO TO 515                                                       03886000
511   LHPOS(1) = COLLE0(HITPT)                                        03887000
      LHREC(3) = 0                                                    03888000
      I1 = 1                                                          03889000
      I2 = 2                                                          03890000
      I3 = 3                                                          03891000
509   PRCHIT = 39 * (LHREC(I1) - 1) + LHPOS(I1)                       03892000
      LHREC(I1) = PRCHIT                                              03893000
      LHREC(I2) = WLL(PRCHIT)                                         03894000
      LHPOS(I2) = WLB(PRCHIT)                                         03895000
      WLL(PRCHIT) = LHREC(I3)                                         03896000
      IF (LHREC(I2) .EQ. 0) GO TO 510                                 03897000
      JUNKX = I1                                                      03898000
      I1 = I2                                                         03899000
      I2 = I3                                                         03900000
      I3 = JUNKX                                                      03901000
      GO TO 509                                                       03902000
C.....HIT CHAIN FOR THIS $LOCATE STRING NOW POINTS FORWARD.           03903000
C.....PRINT ITS CARD IMAGE NUMBERS.                                   03904000
513   WRITE (6,1010) CIHIT                                           03905000
1010  FORMAT (7X,21I6)                                               03906000
510   DO 512 XI = 1, 21                                              03907000
      CIHIT(XI) = WL(PRCHIT)                                          03908000
      PRCHIT = WLL(PRCHIT)                                            03909000
      IF (PRCHIT .EQ. 0) GO TO 514                                    03910000
512   CONTINUE                                                        03911000
      ASSIGN 513 TO BR5                                               03912000
      GO TO 700                                                       03913000
514   ASSIGN 506 TO BR5                                               03914000
C.....PAGINATION ROUTINE.                                             03915000
700   IF (LNZ .LT. 57) GO TO 701                                      03916000
      PGE = PGE + 1                                                   03917000
      WRITE (6,1007) SECTN,PGE                                        03918000
1007  FORMAT ('1',29X,71HCARD IMAGE NUMBERS WHERE INDICATED WORDS/PHRASE03919000
     *S ARE LOCATED -- SECTION,I3,16X,'PAGE',I3//)                    03920000
      LNZ = 0                                                         03921000
701   LNZ = LNZ + 1                                                   03922000
      GO TO BR5, (507,513,506)                                        03923000
C.....END OF PAGINATION ROUTINE.                                      03924000
506   WRITE (6,1010) (CIHIT(XJ), XJ = 1, XI)                          03925000
515   CONTINUE                                                        03926000
      GO TO 505                                                       03927000
516   IF (HIT .EQ. 0) GO TO 517                                       03928000
      REWIND 1                                                        03929000
      IF (HITPT .EQ. 1) BACKSPACE 3                                   03930000
      LNZ = 57                                                        03931000
      GO TO 504                                                       03932000
517   LOCATE = 0                                                      03933000
      RETURN                                                          03934000
      END                                                             03935000
C                                                                     03936000
C                                                                     03937000
C                                                                     03938000
      SUBROUTINE EDITOR                                               03939000
```

```
      IMPLICIT INTEGER*4 (A - Z)                                                03940000
      DIMENSION BUFDUM(40),SAVE1(6),CARRAY(3)                                   03941000
      INTEGER*2 VV(13),BUFFER(80),VV$(12),VAR(8),VAR1,VAR2,VAR3,VAR4,           03942000
     * VARX(7),OVERDE,F1,F2,CWORD,TITLEX,BUFPT,PREN29,OVRCC(7787)               03943000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,              03944000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                               03945000
      INTEGER*2 MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                                03946000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                        03947000
      COMMON IOUTPG,COL,LN,ERRCNT                                               03948000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,                    03949000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,            03950000
     * CIINC,DICT,NEXT,HIT,                                                     03951000
     * OVRRDE,F1,F2,CWORD,TITLEX,BUFPT,                                         03952000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,                      03953000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                         03954000
      COMMON /B/ FIELD1,FIELD2,FIELD3,SPOP,CP,LB,PER,KEEPSV(2),                 03955000
     * UPPER,UP1,CAP,FIRST,MASK1,EXCNT,CPAREN,EOSCHR,SAVMSK                     03956000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SOND,TW03957000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,03958000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IID,03959000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,03960000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,03961000
     * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),                03962000
     * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,           03963000
     * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,         03964000
     * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),                   03965000
     * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                                03966000
      DATA VV,EOF,OLDSER,FWRITE,XWORD,LIST$,XVAR2,CLOSEE                        03967000
     */-1192,18455,18551,18487,18486,18790,18744,18699,18711,18680,             03968000
     * 18775,18712,18758,                                                       03969000
     * 0,0,0,10000,0,0,') E '/                                                  03970000
      EQUIVALENCE (VV$(1),VV(2)),(VAR1,VAR(1)),(VAR2,VAR(2)),(BUFFER(1),03971000
     *BUFDUM(1)),(BUFFER(1),LINEX(1)),(VAR3,VAR(3)),(VAR4,VAR(4))               03972000
     *,(VAR(1),CU(5)),(VARX(1),VAR(2)),(SAVE1(1),LINEX(41)),(PREN29,             03973000
     * SPCHAR(31)),(OVRCC(1),PAGDUM(2)),(CARRAY(1),IOUTPG)                      03974000
      COMMON /EHRMAN/ DARKER,DROPCH,BACKCH,BACKFL,BACKCT,BAXPTF,                03975000
     *                BACKWD,BAKPOS,BACHAR,BACKST,BACKND,NULLSW,                03976000
     * CCWIDT, NOTRIV, MASK2, EDCCWI, UNDRSW, EDCOL1                            03977000
      INTEGER*2 DARKER,DROPCH,BACKCH,BACKFL,BACKCT,BAXPTF,NULLSW,               03978000
     * BACKWD(68), BAKPOS(100), BACKST(8), BACKND(8), CCWIDT, NOTRIV,           03979000
     * MASK2, EDCCWI, UNDRSW, EDCOL1                                            03980000
      LOGICAL*1 BACHAR(100)                                                     03981000
C                                                                               03982000
C                                                                               03983000
C                                                                               03984000
      IF (K .LT. 0) GO TO 100                                                   03985000
C*******************     A     ****************************************03986000
802   READ (5,1000,END=803) BUFFER                                              03987000
      WRITE (1,1001) CCGCNT,CARRAY,BUFFER                                       03988000
1001  FORMAT ('A',4A4,80A1)                                                     03989000
      CCCNT = CCCNT + 1                                                         03990000
1000  FORMAT (80A1)                                                             03991000
      CALL CCRDR (VAR)                                                          03992000
819   SAVCCC = CCCNT                                                            03993000
      IF (NAME .NE. VV(1) .AND. EDCOL1 .NE. DOLLAR) GO TO 8041                  03994000
C.....DO NOT TREAT HOMONYMS AS CONTROL CARDS                                    03995000
      DO 804 I = 1, 13                                                          03996000
      IF (NAME .EQ. VV(I)) GO TO (805,806,845,807,808,809,810,843,847,          03997000
C.....                              GO $DE $IN $EN $DU $PU $NO $LI $ME          03998000
     * 848,844,870,875), I                                                      03999000
```

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C.....  $JO $OV $LO $OM                                                    04000000
804     CONTINUE                                                           04001000
8041    CALL MSG(218)                                                      04002000
        GO TO 802                                                          04003000
C********************      C      ****************************************04004000
803     CALL MSG (800)                                                     04005000
C.....GO                                                                   04006000
C.....THE PART OF 'CU' ARRAY USED BY 'VAR' IS ZEROED WHEN 'GO' IS READ     04007000
805     IF (INVALD .NE. 0) GO TO 824                                       04008000
        IF (MERGE .NE. 0) REWIND IREAD                                     04009000
        IF (FWRITE .EQ. EOF) GO TO 801                                     04010000
824     IF (IREAD .EQ. 4) LIST = LIST$                                     04011000
        PUNCH = 0                                                          04012000
        NODOC = 10                                                         04013000
        LOCATE = 0                                                         04014000
        MASK1 = 0                                                          04015000
        CALL MSG (804)                                                     04016000
        GO TO 867                                                          04017000
801     LIST = LIST + LIST$                                                04018000
        IF (NODOC * OVRRDE .EQ. 0) GO TO 867                               04019000
C.....NEXT 2 LINES ENABLE $OVERRIDE CARDS TO WORK WITH $NO DOCUMENT        04020000
        OVRRDE = -OVRRDE                                                   04021000
        NODOC = -10                                                        04022000
867     RETURN                                                             04023000
C.....$NO DOCUMENT                                                         04024000
810     NODOC = 10                                                         04025000
        GO TO 802                                                          04026000
C.....$PUNCH THE INPUT TAPE                                                04027000
809     PUNCH = 10                                                         04028000
        LIST = 10                                                          04029000
        GO TO 802                                                          04030000
C.....$LIST THE INPUT TAPE                                                 04031000
843     LIST$ = 10                                                         04032000
        GO TO 802                                                          04033000
C.....$OMIT LISTING OF EDITED TAPE                                         04034000
875     OMLIST = -10                                                       04035000
        GO TO 802                                                          04036000
C.....$DUPLICATE THE OLD MASTER FROM ITS PRESENT POSITION                  04037000
808     IF (EOF .EQ. 0) GO TO 813                                          04038000
        CALL MSG (802)                                                     04039000
        GO TO 802                                                          04040000
813     IF (MERGE .EQ. 0) GO TO 835                                        04041000
        CALL MSG (847)                                                     04042000
        GO TO 802                                                          04043000
835     IF (INVALD) 800,812,800                                            04044000
C.....$END CHANGES                                                         04045000
807     IF (FWRITE .GT. EOF + INVALD) GO TO 812                            04046000
800     EOF = 5                                                            04047000
        FWRITE = 5                                                         04048000
        GO TO 802                                                          04049000
812     READTO = 4000000                                                   04050000
        VAR1 = -10                                                         04051000
        GO TO 826                                                          04052000
C.....$INSERT BEFORE XX1,YY1                                               04053000
845     IF (-VAR3 .EQ. VAR4) GO TO 856                                     04054000
        CALL MSG (212)                                                     04055000
        GO TO 846                                                          04056000
C.....$DELETE XX1,YY1  (THROUGH XX2,YY2)                                   04057000
806     IF (-VAR3 .NE. VAR4) GO TO 829                                     04058000
        VAR3 = VAR1                                                        04059000
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      VAR4 = VAR2                                                          04060000
829   IF (VAR4 .EQ. 0) VAR4 = 10000                                        04061000
856   NOGO = 0                                                             04062000
846   IF (EOF .NE. 0) CALL MSG (802)                                       04063000
      IF (MERGE .NE. 0) CALL MSG (847)                                     04064000
      IF ((VAR1 .GT. OLDSER .OR. (VAR1 .EQ. OLDSER .AND. VAR2 .GT. XWORD04065000
     *  .AND. REMNNT .NE. 0)) .AND. (VAR3 .GT. VAR1 .OR. (VAR3 .EQ. VAR104066000
     * .AND. VAR4 .GE. VAR2) .OR. (-VAR3) .EQ. VAR4)) GO TO 815          04067000
      CALL MSG (212)                                                       04068000
815   IF (NOGO .NE. 0) GO TO 861                                           04069000
      READTO = VAR1 - OLDSER - 1                                           04070000
826   IF (FWRITE .NE. 0) GO TO 814                                         04071000
      REWIND 4                                                             04072000
      FWRITE = 5                                                           04073000
      IREAD = 4                                                            04074000
814   BFOUND = 10                                                          04075000
      INSWRD = 10000                                                       04076000
      IF (COVEA .EQ. 0) GO TO 811                                          04077000
      IF (OLDSER .EQ. VAR1 .AND. XWORD .EQ. VAR2 - 1) GO TO 861            04078000
      IF (REMNNT .EQ. 0) GO TO 827                                         04079000
      CALL MSG (814)                                                       04080000
811   IF (OLDSER .EQ. (VAR1 - 1) .AND.                                     04081000
     * (XWORD + VAR2 + XVAR2) .EQ. 10000) GO TO 861                       04082000
      IF (REMNNT .EQ. 0) GO TO 827                                         04083000
      IF (VAR1 .EQ. OLDSER) INSWRD = VAR2 - XWORD                          04084000
      FINISH = 1                                                           04085000
      CALL CONDSE (EOF)                                                    04086000
      FINISH = 0                                                           04087000
827   IF (READTO) 816, 838, 839                                            04088000
839   INSWRD = 10000                                                       04089000
      DO 822 IN = 1, READTO                                                04090000
      READ (2,1000,END=818) BUFFER                                         04091000
      CALL CONDSE (EOF)                                                    04092000
822   CONTINUE                                                             04093000
      OLDSER = OLDSER + READTO                                             04094000
838   IF (VAR2 .EQ. 0 .OR. COVEA .NE. 0) GO TO 816                         04095000
      READ (2,1000,END=818) BUFFER                                         04096000
      OLDSER = OLDSER + 1                                                  04097000
      INSWRD = VAR2                                                        04098000
      CALL CONDSE (EOF)                                                    04099000
C.....HAVE REACHED INSERTION POINT                                         04100000
816   XVAR1 = VAR1                                                         04101000
      XVAR2 = VAR2                                                         04102000
      XVAR3 = VAR3                                                         04103000
      XVAR4 = VAR4                                                         04104000
      IF (INSWRD .EQ. WORDS .OR. INSWRD .EQ. 10000) GO TO 862              04105000
      CALL MSG (805)                                                       04106000
      GO TO 860                                                            04107000
862   IF (VAR2 .NE. 0) GO TO 858                                           04108000
      IF (COVEA) 861,859,861                                               04109000
858   IF (COVEA .EQ. 0) GO TO 861                                          04110000
859   CALL MSG (806)                                                       04111000
860   XWORD = 10000                                                        04112000
861   INSWRD = 10000                                                       04113000
      BFOUND = 10                                                          04114000
825   READ (5,1000,END=803) BUFFER                                         04115000
C.....READ AN UPDATE CARD                                                  04116000
      WRITE (1,1001) CCGCNT,CARRAY,BUFFER                                  04117000
      CCCNT = CCCNT + 1                                                    04118000
      CALL CCRDR (VAR)                                                     04119000
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      IF (EDCOL1 .NE. DOLLAR) GO TO 8171                                04120000
C.....DO NOT TREAT HOMONYMS AS CONTROL CARDS                            04121000
      DO 817 I = 1, 12                                                  04122000
C.....ABOVE STATEMENT REFLECTS SIZE OF VV$                              04123000
      IF (NAME .EQ. VV$(I)) GO TO 823                                   04124000
817   CONTINUE                                                          04125000
8171  CALL CONDSE(EOF)                                                  04126000
C.....WRITE REPLACEMENT TEXT                                            04127000
      GO TO 825                                                         04128000
823   IF (NOGO .NE. 0) GO TO 819                                        04129000
      IF (BFOUND .GT. 0 .OR. COVEA .NE. 0) GO TO 821                    04130000
      DO 837 I = 1, 80                                                  04131000
      BUFFER(I) = BLANK                                                 04132000
837   CONTINUE                                                          04133000
      CALL CONDSE (EOF)                                                 04134000
C.....SQUEEZE OUT A BLANK                                               04135000
821   BFOUND = 10                                                       04136000
C.....NOW GO ELSEWHERE IF WE'RE DELETING                                04137000
      IF (XVAR3 .NE. 0) GO TO 820                                       04138000
C.....NOTE THAT WORD X1,Y1 (OR CARD IMAGE X1) IS NOT WRITTEN HERE ONTO  04139000
C.....NEW MASTER. THUS, MULTIPLE IDENTICAL $INSERT'S ARE ALLOWED.       04140000
      XWORD = XVAR2 - 1                                                 04141000
      IF (XVAR2 .EQ. 0) XWORD = 10000                                   04142000
      GO TO 819                                                         04143000
820   INSWRD = 10000                                                    04144000
      IF (XVAR3 .LT. 32767) GO TO 869                                   04145000
      IF (COVEA .NE. 0) GO TO 818                                       04146000
      BUFDUM(1) = CLOSEE                                                04147000
      CALL CONDSE (0)                                                   04148000
818   EOF = 5                                                           04149000
      CALL CONDSE (EOF)                                                 04150000
      IF (CCCNT - SAVCCC) 802,802,819                                   04151000
869   DELETE = 10                                                       04152000
      XWORD = XVAR4                                                     04153000
      READTO = XVAR3 - XVAR1                                            04154000
      IF (REMNNT .EQ. 0) GO TO 831                                      04155000
      READTO = READTO - 1                                               04156000
      FINISH = 1                                                        04157000
      IF (XVAR3 .EQ. XVAR1) INSWRD = XVAR4 - XVAR2 + 2                  04158000
      CALL CONDSE(EOF)                                                  04159000
      FINISH = 0                                                        04160000
      IF (XVAR3 .EQ. XVAR1) GO TO 841                                   04161000
831   OLDSER = OLDSER + READTO                                          04162000
      INSWRD = 10000                                                    04163000
832   IF (READTO .EQ. 0) GO TO 833                                      04164000
      READTO = READTO - 1                                               04165000
      READ (2,1000,END=871) BUFFER                                      04166000
      CALL CONDSE (EOF)                                                 04167000
      GO TO 832                                                         04168000
833   INSWRD = XVAR4 + 1                                                04169000
842   READ (2,1000,END=871) BUFFER                                      04170000
      OLDSER = OLDSER + 1                                               04171000
      CALL CONDSE (EOF)                                                 04172000
841   IF (INSWRD .GE. 10000) GO TO 836                                  04173000
      IF (INSWRD - WORDS - 1) 836,828,840                               04174000
828   IF (BFOUND .NE. 0  .AND.  COVEA .NE. 0) GO TO 830                 04175000
C.....MUST FLUSH OUT THE CARD WITH A PARTIAL WORD ON IT IF THE COMMAND  04176000
C.....WORD ENDING IN V/E/A WAS SPLIT OVER THE END OF THE CARD           04177000
      XWORD = 0                                                         04178000
      INSWRD = 1                                                        04179000
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      GO TO 842                                                          04180000
 871  EOF = 5                                                            04181000
 840  CALL MSG (807)                                                     04182000
 830  XWORD = 10000                                                      04183000
 836  DELETE = 0                                                         04184000
      GO TO 819                                                          04185000
C.....$JOIN TAPES XX1 ... XX8                                           04186000
 848  MERGE = -20                                                        04187000
      GO TO 854                                                          04188000
C.....$MERGE TAPES XX1 ... XX8                                          04189000
 847  MERGE = 20                                                         04190000
 854  IF (FWRITE .NE. 0) CALL MSG (847)                                  04191000
      DO 851 IN = 1, 8                                                   04192000
      TAPE = VAR(IN)                                                     04193000
      IF (TAPE .EQ. 0) GO TO 849                                         04194000
      IF (TAPE .LT. 9 .AND. TAPE .NE. 4) CALL MSG (212)                  04195000
      IF (INVALD .NE. 0) GO TO 851                                       04196000
      REWIND TAPE                                                        04197000
      IF (VARX(IN) * (IN - 8) .EQ. 0) MERGE = 20                         04198000
 852  READ (TAPE,1000,END=853) BUFFER                                    04199000
      CALL CONDSE (0)                                                    04200000
      GO TO 852                                                          04201000
 853  CALL CONDSE (10)                                                   04202000
 851  CONTINUE                                                           04203000
 849  IF (VAR(1) .EQ. 0) CALL MSG (212)                                  04204000
      MERGE = 20                                                         04205000
      GO TO 802                                                          04206000
C.....$OVERRIDE FIRST CONTROL CARD GROUP                                04207000
 844  SAVE1(1) = NODOC                                                   04208000
      SAVE1(2) = COVEA                                                   04209000
      SAVE1(3) = F1                                                      04210000
      SAVE1(4) = F2                                                      04211000
      SAVE1(5) = TITLEX                                                  04212000
      SAVE1(6) = CPAREN                                                  04213000
      NODOC = -20                                                        04214000
      COVEA = 10                                                         04215000
      F1 = 1                                                             04216000
      F2 = 80                                                            04217000
      CPAREN = PREN29                                                    04218000
 866  READ (5,1000,END=803) BUFFER                                       04219000
      WRITE (1,1001) CCGCNT,CARRAY,BUFFER                                04220000
      CCCNT = CCCNT + 1                                                  04221000
      SAVCCC = CCCNT                                                     04222000
      CALL CONDSE (0)                                                    04223000
      IF (NAME .NE. VV(1) .AND. EDCOL1 .NE. DOLLAR) GO TO 8631           04224000
C.....AVOID HOMONYMS FOR CONTROL CARDS                                  04225000
      DO 863 I = 1, 13                                                   04226000
C.....ABOVE STATEMENT REFLECTS SIZE OF VV ARRAY                         04227000
      IF (NAME .EQ. VV(I)) GO TO 864                                     04228000
 863  CONTINUE                                                           04229000
 8631 IF (NAME .NE. (-12155) .AND. NAME .NE. (-19384)) GO TO 857         04230000
C.....                  TITLE                    FOOTER                 04231000
      JUNK = 857                                                         04232000
      GO TO 868                                                          04233000
 857  IF (NAME .LT. 0) GO TO 855                                         04234000
      JUNK = 218                                                         04235000
 868  CALL MSG (JUNK)                                                    04236000
      COVEA = 10                                                         04237000
      GO TO 866                                                          04238000
 855  DO 865 I = 1, 80                                                   04239000
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      OVRRDE = OVRRDE - 1                                                04240000
      JUNK = -OVRRDE                                                     04241000
      OVRCC(JUNK) = BUFFER(I)                                            04242000
C.....REPLACE ABOVE 2 WITH, OVRCC(-OVRRDE) = BUFFER(I) WHEN H BUG FIXED. 04243000
865   CONTINUE                                                           04244000
      GO TO 866                                                          04245000
864   CALL CCRDR (VAR)                                                   04246000
      NODOC = SAVE1(1)                                                   04247000
      COVEA = SAVE1(2)                                                   04248000
      F1 = SAVE1(3)                                                      04249000
      F2 = SAVE1(4)                                                      04250000
      TITLEX = SAVE1(5)                                                  04251000
      CPAREN = SAVE1(6)                                                  04252000
      GO TO 819                                                          04253000
C.....$LOCATE THE FOLLOWING WORDS/PHRASES                                04254000
870   READ (5,1000,END=803) BUFFER                                       04255000
      WRITE (1,1001) CCGCNT,CARRAY,BUFFER                                04256000
      CCCNT = CCCNT + 1                                                  04257000
      SAVCCC = CCCNT                                                     04258000
      CALL CCRDR (VAR)                                                   04259000
      IF (NAME .NE. VV(1) .AND. EDCOL1 .NE. DOLLAR) GO TO 8721           04260000
C.....AVOID HOMONYMS FOR CONTROL CARDS                                   04261000
      DO 872 I = 1, 13                                                   04262000
      IF (NAME .EQ. VV(I)) GO TO 819                                     04263000
872   CONTINUE                                                           04264000
8721  WRITE (1,1002) BUFFER                                              04265000
1002  FORMAT ('L',16X,80A1)                                              04266000
      LOCATE = LOCATE + 1                                                04267000
C.....LOCATE = NUMBER OF ARGUMENTS TO BE LOCATED                         04268000
      GO TO 870                                                          04269000
C*************************************************************************04270000
C.....THIS IS THE "CREATE" ROUTINE                                       04271000
C*************************************************************************04272000
C.....RESET K EACH TIME TO AVOID ERROR FLAGS FOR BAD COMMAND WORDS       04273000
100   K = -10                                                            04274000
      READ (5,1000,END=105) BUFFER                                       04275000
      CALL CONDSE (0)                                                    04276000
      GO TO 100                                                          04277000
105   CALL CONDSE (10)                                                   04278000
      GO TO 867                                                          04279000
      END                                                                04280000
C                                                                        04281000
C                                                                        04282000
C                                                                        04283000
      SUBROUTINE MSG (/MSGNO/)                                           04284000
      IMPLICIT INTEGER*4 (A - Z)                                         04285000
      INTEGER*2 LIST,COPIES,SPCHAR,BLANK,NUM,SCWORD,HYPHEN,LOWCAS,       04286000
     * PERIOD,KEY028,LOCATE,CARDIC,OMLIST,DOLLAR                        04287000
      INTEGER*2 PAGDUM,SRT,COLBEG,CHRFIN                                 04288000
      COMMON /A/ POSN,IREAD,IWRITE,CCGCNT,PUNCH,NODOC,MERGE,             04289000
     * REMNNT,INSWRD,FINISH,DELETE,COVEA,INVALD,BFOUND,CICNT1,CICNT,     04290000
     * CIINC,DICT,NEXT,HIT,                                              04291000
     * ARRAY1(3),                                                        04292000
     * LIST,COPIES,SPCHAR(42),BLANK,NUM(10),SCWORD,CARDIC,               04293000
     * HYPHEN,LOWCAS,PERIOD,KEY028,LOCATE,OMLIST,DOLLAR                  04294000
      COMMON /C/ ALT,BLNKLN,ITEXT,LINPAG,MYPAGE,RIVER,HYPTRX,WPT,SUND,TW04295000
     *,TWOUP,I,CPSW,ISPOT,ASIS,CCHAR,CHARCO,NEWH,SAVCCC,KEEP,WPTX,LWI,N,04296000
     * LINSIZ,NSYM,SPACNG,TXTLNE,K,LSTBL,AUTO,FFLN,NOGO,NAME,SWK028,IIU,04297000
     * CCCNT,COLPAG,IVALUE,LINSZ,PAGENO,START,UNDERL,J,CONST,AUTOTB,SWX,04298000
     * JUNK,ID,PDUM,REM,IER700,END,CENTER,CSEP,INDENT,TEXEND,TLLN,CLEAN,04299000
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      * LN2,REPTTL,IC,CWIDTH,USEWS1,LTITLE,CU(8),TAB2(7),INDP(4),          04300000
      * INDARR(8),FLN,ICINC,PARA,TFLN,USTART,FCM,SWWPT,ENDL,EWX,PIVOT,     04301000
      * INDEX,TABSEQ,CHAR,ENDF,LINEX(67),WORDS,LNTW,CS,ENDSAV,ID1,LINEW,    04302000
      * WANT,GAPS,WANTIN,WSEPDL,LSIDE,RSIDE,SWEW(68),CARD(40),             04303000
      * PAGDUM(7788),SRT(99),COLBEG(8),CHRFIN(99)                          04304000
       CALL ERR (SAVCCC,MSGNO)                                            04305000
       NOGO = 10                                                          04306000
       INVALD = 10                                                        04307000
C.....THE VALUE OF 10 ASSIGNED TO INVALD IS USED COMPUTATIONALLY          04308000
       INSWRD = 10000                                                     04309000
       COVEA = 0                                                          04310000
       RETURN                                                             04311000
       END                                                                04312000
```