MCM
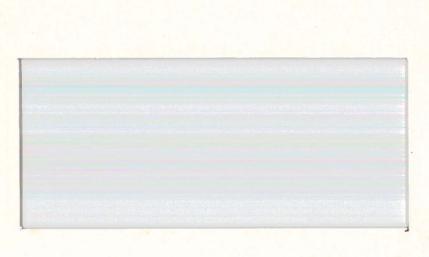
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M C M

T e x t / 7 0 0

Text/700 is a word processing system

which runs on an 8K MCM/700 equiped with

cR TWO DISes

two cassette drives and a Hytype printer.

It is intended to be used for the preparation

and maintenance of printed documents.

Table of Contents

INTRODUCTION

In the Text/700 system documents, in the form of lines of text, are stored on cassette tapes. *or Discs* Information is stored in sequential order on these tapes and hence they are not compatible with MCM/APL tapes.

The Text/700 system consists of four functions:

1. INPUT: a program that creates a new document on a tape from keyboard input.

2. LIST: a program that provides an unformatted listing of the content of a tape.

3. EDIT: a program that allows the user to read a tape, modify the lines one by one and create a new tape with these modified lines.

4. FORMAT: a program that reads a document from tape then formats and prints it. This program controls the formating of the final document and has provisions that allow the user to interact with these formatting controls.

In the Text/700 system documents are stored one to a tape and each tape can contain about 40 pages of text. Documents longer than this can be stored on multiple tapes. The left tape drive on the MCM/700 is the SOURCE drive, so named because it is the cassette tape on this drive that is the source of the data required by LIST, EDIT and FORMAT. Data is never written on a tape that is in the source drive. The right drive is the DESTINATION drive, as it is on the tape in this drive that new documents are created by INPUT and EDIT.

Tapes that are used to store documents do not have to be initialized, however if a Text/700 document is stored on an APL tape then all the APL data and functions on that tape are deleted and the tape must be fully initialized (the 15 minute version) before it can be used as an APL tape again.

Text/700 comes as a complete package on tape. To load and start it, place the Text/700 tape on an MCM/700 which is turned off. When the START key is pressed the workspace containing Text/700 will be loaded, the tape rewound and the message "*** PLEASE REMOVE TAPE ***" displayed. Once the tape is removed Text/700 is ready for use.

When Text/700 is started it immediatly enters a monitor which displays the message "Text/700 " on the screen and then waits for you to press a key selecting one of the four main functions. Pressing "I" starts INPUT, "E" starts EDIT, "F" starts FORMAT while "L1", "L2" or "L3" will start LIST. When these main functions are finished, control returns to the monitor. To turn the MCM/700 off, reply "Off" to the monitor; it will rewind any tapes and then shut the machine off. Should the power fail while you are using Text/700, it will close the tapes and turn the machine off also. After such a power failure it is necessary to re-load the Text/700 tape.

It is possible to interrupt the Text/700 system at any time by holding down CTRL, SHIFT and "]" (the same keys as CTRL/SHIFT/BRANCH in APL), waiting until all activity stops and then releasing the keys. When interrupted, any tapes mounted are rewound, the system is restarted and control passes to the

monitor. When printing with LIST or FORMAT, it is possible to cause printing to pause simply by holding down the CTRL key unitl the printing stops. Pressing any other key will cause printing to resume

The Text/700 system uses the standard MCM/700 keyboard and display device, however they function somewhat differently than they do with APL. The Text/700 character set consists of upper and lower case letters, digits and various special characters; they are arranged on the keyboard as shown below.

```
 .-------------------------------------------------------------------------------.
 | !  | @  | #  | $  | %  | ¢  | &  | *  | (  | )  | _  | +  |BACK-|
 | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 0  | -  | =  |SPACE|
 |-----------------------------------------------------------------------------|
 |START| Q  | W  | E  | R  | T  | Y  | U  | I  | O  | P  | ]  |RETURN|
 |     | q  | w  | e  | r  | t  | y  | u  | i  | o  | p  | [  |      |
 |-----------------------------------------------------------------------------|
 |CTRL | A  | S  | D  | F  | G  | H  | J  | K  | L  | :  | "  |      |
 |     | a  | s  | d  | f  | g  | h  | j  | k  | l  | ;  | '  |      |
 |-----------------------------------------------------------------------------|
 | SHIFT | Z  | X  | C  | V  | B  | N  | M  | <  | >  | ?  | SHIFT |
 |       | z  | x  | c  | v  | b  | n  | m  | ,  | .  | /  |       |
 '-----------------------------------------------------------------------------'
             `       ^       ~      \     |     {     }     ¬
```

Text/700 KEYBOARD LAYOUT

The symbols "`", "^", "~", "\", "|", "{", "}" and "¬" are special characters which can be formed by holding down the CTRL key and pressing the key shown immediatly above the character in the diagram.

When creating text using the Keyboard/HyType it is possible to create any combination of overstrikes by using the BACKSPACE key. If these are later shown on the display, each backspace

appears as a left arrow - this is because it is not possible to represent all possible overstrikes within one character position on the display. Thus the word "zot" would appear on the display as "zot←←← __". When editing a line on the Keyboard/Display it is possible to enter character backspaces by using CTRL/SHIFT/BACKSPACE - this will appear as a left arrow "←' on the display and when printed causes the print head to move one position to the left. Thus to enter "zot" on the Keyboard/Display, key "zot", three CTRL SHIFT BACKSPACES, and three underscores.

In APL the maximum length of a line from the keyboard is 85 characters while with Text/700 the maximum is 110 print positions, or 240 characters.

INPUT

To use INPUT place a tape on the DESTINATION drive then type "I" in reply to the initial message issued by the Text/700 monitor. INPUT will open the tape and then display the message "Tape Id:" indicating that it is waiting for you to enter a comment that identifies the content of the tape. This comment is maintained by the Text/700 system at the front of every tape and is useful for keeping track your tapes. The comment can be anything you like but should fit on the display as excess characters will be dropped. After pressing RETURN, INPUT will display the message "Creation Date:" and wait for you to enter the date. The date is a comment like the Tape Id; it can be useful for keeping track of tape sequence. After pressing RETURN the program waits for you to enter text on the keyboard; as you enter characters, they are printed on the HyType much as if you were using a typewriter. Since the ribbon on the HiType tends to block your view of the characters just printed, INPUT will raise the paper when nothing is being typed and lower it again as soon as you touch a key. If no keys are typed for a period of one second then the paper is raised again. The paper will remain down as long as characters are being typed faster than one a second. Type the text you want entered until the line is full or nearly full then press RETURN. Each time RETURN is pressed the line you have entered is written out on tape and the computer waits for you to enter the next line. As much text as you want can be entered in this manner. To stop entering text type a line whose

.

one and only character was formed by holding down both CTRL and SHIFT then typing a "1" followed by RETURN. The computer will then rewind the tape and pass control back to the Text/700 monitor.

The BACKSPACE key works much like the backspace key on a typewriter and can be used to underscore and create overstruck characters. Backspaces which are keyed in, however, also will be printed when a document is listed. For this reason we need something other than plain BACKSPACE for the correction of errors. In order to correct typing errors, hold down both CTRL and BACKSPACE until the print hammer is in front of the error. The error can then be corrected and typing resumed. Note that when an error is corrected using CTRL/BACKSPACE the computer moves the corrected print down a line. This makes it possible to read the correction easily and also indicates that it was a correction, rather than an overstrike that was made. CTRL/BACKSPACES do NOT count as characters, they are merly a method of allowing you to back up and type portions of the line over again and as such do not take up any room.

Since the computer writes each line on tape when the return key is pressed, it is not possible to correct errors in a line after the RETURN key has been pressed - the EDIT program can be used to correct such errors.

INPUT can be used on an MCM/700 system that is not equiped with a HyType, in which case lines are entered on the keyboard/display before being written on tape.

EDIT

EDIT is used to make any number of changes and corrections to a tape. To use EDIT place the tape that will be used to save the corrected document on the DESTINATION drive, place the tape which contains the text to be edited on the SOURCE drive then type "E" in reply to the initial message issued by the Text/700 monitor. The SOURCE tape will be opened and its Tape Id will be displayed along with the cursor, giving you a chance to change the ID if you wish. Pressing RETURN will display the Creation Date, again with the cursor, allowing you to change it also. Changes made to the Tape Id and Creation Date affect the DESTINATION tape only, the SOURCE tape is not altered.

EDIT operates by reading text from the SOURCE tape, making corrections as directed by the user and then writing the updated text on the DESTINATION tape. The SOURCE tape is not altered by this process. EDIT works one line at a time, that is, it allows you to correct line one, then line two, then line three and so on until the end of the source tape is reached at which time both tapes are rewound and control passes back to the monitor. Note that you can not back up through the lines, once you are at line five, you can not change your mind and go back to line three without finishing the edit, switching the SOURCE and DESTINATION tapes and starting the edit over again. For this reason it helps to be sure that you are really finished with one line before going on to the next. There are methods of searching through lines for specific bits of text but this can be done in the forward direction only.

After you have pressed RETURN following possible modifications to the Tape Id and Creation Date, the actual editing of the document begins. EDIT reads a line of text from the source tape and puts the first 32 characters of it on the display. You can use the display to make any changes you wish to the line. When you have done whatever you want with to line (in many cases, nothing) press RETURN and the computer will display the message "enter edit instruction" indicating that EDIT is waiting for you to press a key to indicate what action it should take with the line. Since there are many instances during an edit when the program is waiting for you to do something, it always issues an appropriate message; if you have forgotten what stage of the edit you are at or why the computer isn't doing anything a message will usually be on the screen indicating what it is waiting for.

There are eight actions that EDIT can perform; each action is associated with a key - pressing an appropriate key initiates the action:

K E Y   A C T I O N

RETURN   The current line is copied onto the DESTINATION tape without any further modification, then the next line is read from the SOURCE tape and placed on the display for editing.

D   The current line is deleted from the DESTINATION tape, then the next line is read from the SOURCE tape and placed on the display for editing.

R The current line is replaced by line or lines from the keyboard. Any number of lines can be entered to replace a single line. To stop entering lines, enter a line whose one and only character was formed by holding down both CTRL and SHIFT then typing "1" followed by a RETURN, the next line is then read from the SOURCE tape and placed on the display for editing.

P The current line is printed on the HyType.

I Line(s) are accepted from the keyboard and inserted after the current line. This command is similar to the "R" command except that the new line(s) follow the current line rather than replacing it.

E This command allows you to have the current line back on the display for further editing and corrections. When you are through using the display to make changes a RETURN will cause the computer to wait for you to enter another edit instruction, just as it did the first time you had the line on the display. Thus you can edit a line on the display, print it and then go back and make further changes as many times as you like.

S This is the search command; it allows you to quickly scan through a document looking for a specified string of characters. As soon as you press the "S" indicating it is a SEARCH you want, the message "enter search string"

appears and the paper in the HyType moves up a line, indicating that input is to be on the Keyboard/HyType. Type in the string of characters that you wish to search for and then press RETURN. The computer will search the current line for a string of characters that matches the one you just typed in. If it finds a match it prints the line, then places it on the display for editing. If a match is not found, however, SEARCH copies the current line, then searches the next line and the next and so on until a match IS found. Since lines that don't contain a match are not printed the SEARCH instruction is a fast way of skipping over long portions of text that are to remain unchanged. Is is important to be careful when typing in the string to be searched for (note that CTRL/BACKSPACE can be used to make corrections when entering the string the same as in INPUT) as if you enter a string that does not exist anywhere in your SOURCE tape, this command will search the entire tape. If you wish to copy the rest of a tape after having finished making corrections, searching for a non-existant string will do so.

When the search string you specify contains spaces there may be times when SEARCH stops and prints a line that does not appear to contain a match to the search string. This occurs because SEARCH has no way of knowing if the string you are searching for is broken over more than one line. If it finds, at the end of a line, a string of text

that has so far matched your search string then it assumes that the next line contains the balance of the string and therefore prints the line indicating a match. For example, if the search string were "this is an example" and SEARCH found a line of text that ended "...this is an" then it would print the line as if it had a match for the string. While this prevents you from missing searh strings that are broken over two lines, it can on occasion find a match where the next line is not in fact what you are looking for, in which case the CONTINUE (see below) command will re-start the search.

C   The computer continues searching for the next occurance of the string specified by the most recent SEARCH instruction. This command is valid ONLY immediatly after a string has been matched by a SEARCH or another continue statment.

When EDIT reaches the end of the SOURCE tape it displays the message "end of file" and then waits for you to press a key. Pressing RETURN will cause EDIT to close the tapes and return to the Text/700 monitor, while pressing "i" will cause insertion line to be accepted in the usual manner. When the insertion lines are terminated (with CTRL/SHIFT/1) the tapes are closed and EDIT returns to the monitor.

EDIT can be used on an MCM/700 that is not equiped with a HyType; in this mode all input is accepted on the

Keyboard/Display rather than on the Keyboard/HyType and the PRINT command is ignored. When searching without a HyType, when a line is found that contains the search string, the line is placed on the display for editing.

LIST

LIST is used to produce an unformatted listing of the text on a tape. To use LIST place the tape to be listed on the SOURCE drive, then type "L1", "L2" or "L3" (for single, double or triple spacing) in response to the initial message issued by the Text/700 monitor. An unformatted listing of the entire tape will be printed. When the listing is finished, the tape will be rewound and control passed back to the monitor.

FORMAT

FORMAT reads tapes prepared with INPUT or EDIT, formats the text according to the users directions then prints the text on the HyType printer. To use FORMAT place the tape containing the text to be formatted on the SOURCE drive then press "F" in response to the message issued by the Text/700 monitor.

When started, FORMAT displays the Tape Id and Creation Date from the SOURCE tape, then displays the message "Flag chages?" and waits for you to type "y" or "n". If you decide not to flag the changes then the document is printed without further ado. If changes are to be flagged, then an asterisk will be printed in column one of each line that was changed in any way during the last edit. This option is useful when proof reading a long document; the asterisks indicate the areas in which changes have been made, allowing you to skip over the portions of text that have remained unchanged. Since one line from the tape may become spread over several printed lines, the asterisks tend to indicate the general area in which changes have been made rather than pinpointing the exact line.

The facilites offered by FORMAT range from elementary to complex. Although a wide variety of instructions are available to give the user control over everything from the number of lines per page to the width of each printed character, FORMAT can still be used to format text in the absence of any explicit instructions from the user. Someone who has never before used a computer or a word processor can make use of FORMAT knowing only

a single rule. As their requirments increase, control instructions can be gradually introduced, allowing them to handle more complex formatting tasks.

FORMAT BASICS

Although only a single rule is necessary to start making use of FORMAT, a brief discussion of how it works is in order first. When FORMAT reads text from a tape and prints it on the HyType, it does not simply read one line from the tape and print that one line, as is, on the printer. FORMAT reads a line from tape and takes the words from that line, one by one, and creates a new line. If there are not enough words in the first line from tape, then the next line and the next are read until FORMAT has filled the new line it is creating. If, on the other hand, there are more words in the first line from the tape than will fit on the line being assembled, then only as many as will fit are taken, the rest are saved for the next line or lines. When FORMAT's new line is full, it prints the line, then picks up where it left off assembling words to make up the next line. Thus the position of a word in a line as read by FORMAT is not necessarily the same as its position in the printed line. Below is an example of some text exactly as it was recorded on tape using INPUT and EDIT.

- - - - - - - - - -

MONTREAL (CP) -- A baboon got away
from his Park Safari African custodians Saturday, leading
police, firemen and other would-be
captors on a hectic chase through the downtown area before
being brought down.

The year-old male took leave from the camping display at
downtown Place Bonaventure, scampering down city streets to perch
on the roof of a nearby building.

His pursuers joind him and the runaway baboon
outraced them back to the street,
where he was
subdued with a tranquilizer gun by a park worker.

- - - - - - - - - -

The lengths of the lines vary considerably - a frequent
occurance after many changes and corrections have been made.
Below is the same text as it appears after having been processed
by FORMAT.

- - - - - - - - - -

MONTREAL (CP) -- A baboon got away from his Park Safari African custodians Saturday, leading police, firemen and other would-be captors on a hectic chase through the downtown area before being brought down.

The year-old male took leave from a camping display at downtown Place Bonaventure, scampering down city streets to a perch on the roof of a nearby building.

His pursuers joind him and the runaway baboon outraced them back to the street, where he was subdued with a tranquilizer gun by a park worker.

- - - - - - - - - -

The format of the second example contains one discrepancy however. If the computer works word by word, filling up each line before printing it, how did it know to leave the line ending "...before being brought down." partly empty in order to start the next paragraph "The year-old male..." on a new line? The answer is in the way FORMAT treats the RETURN that occurs at the end of each line, and here we have our one rule:

R U L E: IF A RETURN IS: a) IMMEDIATLY PRECEEDED BY ANOTHER RETURN b) IMMEDIATLY FOLLOWED BY ANOTHER RETURN, or c) IMMEDIATLY FOLLOWED BY A SPACE THEN A NEW LINE IS STARTED, OTHERWISE IT IS TREATED AS A SPACE.

As a result of this rule a line which starts with one or more spaces will cause a new line to be started. This property of FORMAT can be put to many uses one of which is tables. In order to assure that each line of a table actually appears on a new line, a space should be the first character of each line.

- - - - - - - - - -

Bermuda	4.50	4.50	6.00	6.00
France	7.35	7.35	12.00	12.00
Germany	7.35	7.35	12.00	9.00
Great Britain	6.00	4.50	9.00	6.75
Italy	7.35	5.55	12.00	9.00

- - - - - - - - - -

In the table above, each line started with a space and the table is correctly formatted. The same table without the leading spaces would look like this:

- - - - - - - - - -

Bermuda				4.50	4.50	6.00	6.00 France
			7.35	7.35	12.00	12.00 Germany
	7.35	5.55	12.00	9.00 Great Britain
6.00	4.50	9.00	6.75 Italy			7.35
5.55	12.00	9.00

- - - - - - - - - -

which is not exactly the desired result.

Lacking any other instructions from the user, FORMAT assumes that the text being formatted is to go on standard 8 1/2" x 11" paper. For this reason it sets the margins at 10 and 75, single spaces the text and will allow 56 lines of text per page. When the bottom of the page is reached the message "Insert next page" appears on the display; the computer then waits for you to set up the next page and press Return. The page number is printed, then the rest of the page is formatted. After the last page has been printed, the tape is rewound and the message "End of file" is shown on the display. Pressing Return at this point will restart Text/700.

KEYWORDS

The Text/70 KEYWORD facility is a convenient method of handling portions of text which are known to change each time a document is formatted. In a form letter, for example, the only text in the entire letter which changes might be the name and address of the recipient, and the date. While you could use EDIT to change these things every time the letter was printed, there is an easier way.

FORMAT considers any string of characters that starts and ends with a replacement symbol ("¬") to be a KEYWORD. Some examples of valid KEYWORDS are: ¬Date¬, ¬time_of_day¬, ¬Occupation¬ and ¬???¬. The only restrictions on the formation of KEYWORDS are that they may not contain blanks or equsl signs and they should not be longer than 24 characters. When FORMAT finds a KEYWORD, it does not print it, instead it displays a message of the form "Define: _____" where _____ is the text that was between the replacement symbols. If the computer had found the KEYWORD ¬Occupation¬, for example, then be message would be "Define: Occupation". FORMAT then waits for you to type in the definition of the KEYWORD. The definition can be any string of characters (up to about 110 long) and it appears on the display as you type it. When all of the definition has been typed, press Return. The computer then substitutes the definition in place of the KEYWORD. This does NOT change the tape being formatted as the substitution applies only to the printed output. For example suppose the text on tape read "The meeting was held on ¬Date¬ at the home of...". When the symbol ¬Date¬ was found the computer would display the

message "Define: Date" and would wait for the user to enter the definition. If the user typed in "March 10, 1976" then the printed text would be "The meeting was held on March 10, 1976 at the home of..."

In cases where a replacement symbol is to be printed rather than to indicate the start of a KEYWORD, A double replacement symbol "¬¬" is used. Thus the text "¬¬Test¬¬" would print as "¬Test¬".

If the same KEYWORD is used more than once the computer does not ask you to define it again. The first time a KEYWORD is defined the computer saves the definition; for second and subsequent usages of the same KEYWORD the definition is substituted without pause. Many KEYWORDS may be used in a single document. The limit on the number of keywords is discussed in Appendix B, however there is room in for about 25 KEYWORDS similar to ¬Date¬ in the above example.

OPTIONAL TEXT

There are times when it is necessary to have blocks of text, which may or may not be included in the final document, that are longer than may be conveniently handled with the KEYWORD facility. The Text/700 OPTIONAL TEXT facility allows the user to place these blocks of text in his document on tape and then decide if they are to be included in the final document as it is being printed. When Text/700 finds a tilda ("~") followed immediatly by a word, it places the message "Include: ----?" on the display where ---- is the word following the tilda, and then

waits for the user to type y or n. If you type y, then the tilda, the word, and the space that followed it are all ignored and the formatting of the document continues as if nothing had happened. If you type n however, then Text/700 skips through the text from the SOURCE tape without printing it until it comes to the next tilda. If that tilda is followed by a word then the process is repeated, with the user having the option of including the text that follows the second tilda. If a tilda is immediatly followed by a space, then it simply causes the system to stop skipping text and resume normal processing. If a tilda followed by a space is found in the midst of text which is not being skipped, then it is simply ignored and not printed. It is important when using this facility to note that the tilda and the first space following it are never printed. If you actually want to print a tilda in a document, it is necessary to include two tildas on the tape - they will print as only one and will not cause the computer to stop and issue the "Include: ---?" message.

LONG DOCUMENTS

One tape will hold about 40 pages of dense single spaced text, however documents of any length can be handled using multiple tapes. To create such a document, use INPUT in the usual manner until the tape is nearly full, then close it and mount another tape and carry on in this manner until the entire document has been entered. The Tape Id of the tapes can include "Tape-1", "Tape-2"... or something similar to indicate which is which. These tapes can now be listed and edited in the usual way.

When the document is to be formatted, start FORMAT with the first tape, as with any other document. When FORMAT reaches the end of the tape it will rewind it and display the "End of tape" message; at his point instead of pressing Return to terminate FORMAT, remove the tape, mount the next one and press "c" to continue. FORMAT will display the Tape Id and Creation Date then carry on as if nothing had happened. This procedure should be repeated until the last tape has been printed.

When first creating such a long document, it is important not to completly fill any of the tapes. The last few feet of tape where it meets the hub are not reliable and may cause data to be lost. In addition, leaving some room at the end of the tape allows for expansion if it is necessary to add items to the document during subsequent edits.

CONTROL INSTRUCTIONS

The information that FORMAT reads from a tape consists of both text to be fomatted and instructions from the user that direct the formatting of the text. To allow FORMAT to tell text from control instructions it is always necessary to enclose control instructions in braces "{}".

The computer needs to know certain things in order to format the text, for example it must know where the left and right margins are to go, if it is to use single, double or some other spacing, whether or not to indent at the begining of a new paragraph, and if so, how much, how many lines to print before starting a new page and so on. These are the ATTRIBUTES of the

page being formatted; FORMAT maintains ten such attributes. There are CONTROL INSTRUCTIONS that allow the user to change these ATTRIBUTES at any time. Each ATTRIBUTE has a DEFAULT VALUE, if you don't tell the computer what value you want for a particular ATTRIBUTE then it will assume the DEFAULT VALUE. In addition to the instructions which assign values to attributes, there are instructions which direct FORMAT to take action, such as centering some text or skipping a specified number of lines. The table below lists all the valid FORMAT instructions. Each instruction will be discussed in detail below.

INSTRUCTION	ATTRIBUTE	DEFAULT VALUE
Lxxx	Left margin	L10
Rxxx	Right margin	R75
Sxxx	Spacing	S1 (single spacing)
Pxxx	Pagesize	P58
Fxxx	Formsize	F0
Ixxx	Indentation	I0 (no indentation)
Wxxx	Width of Characters	W6 (10 characters per inch)
Jx	Justification	J1 (on)
H'---'	Heading	H'{E,C}¬pageno¬{X1,TU}'
N'--'	Page Number	N' 1'
Ax	Automatic Formatting	A1 (on)

INSTRUCTION	ACTION
Txxx	Tab to position left-margin + xxx
Xxxx	Skip xxx lines
Bxxx	Bypass xxx pages without printing them.
M'-'	Hytype modify.
Exxx	Eject (Start a new page)
C	Center the following text

Where xxx represents a number and '--' represents a string of one or more characters inclosed in single quotes.

In addition to indicating the start of control instructions, the left brace "{" also causes the computer to

start a new paragraph with the text that follows the control instructions. Since any number of control instructions (including none) can appear between the braces, the simplest possible control sequence is a left brace followed by a right brace "{}" which causes a new paragraph to be started. More complex control expressions can be formed by placing several instructions, seperated by commas, between the braces e.g. {L12,R85,J1,I4}. The appearance of a semicolon immediatly following the left brace "{;...}" causes control instructions to be processed without a new paragraph being started.

Lxxx   The LEFT MARGIN attribute specifies the width of margin to the left of the formatted text and can be anything between zero and 127.

Rxxx   The RIGHT MARGIN attribute specifies the right most character position that may contain text. This attribute can have any value between one and 250 as long as it is always greater than the value of the LEFT MARGIN.

Sxxx   The SPACING attribute indicates the number of line feeds to be done at the end of each line - one for single spacing, two for double spacing and so on.

Pxxx   The PAGESIZE attribute specifies the number of
          lines to be printed before starting a new page.
          When using double spacing, note that each printed
          line is followed by a blank line and hence takes
          up two lines on the page. Twenty-four lines of
          double spaced text will therefore fill a page if
          the PAGESIZE is set at forty-eight.

Fxxx   The FORMSIZE attribute is of use when printing on
          continuous forms rather than on seperate sheets of
          paper. If FORMSIZE is greater than PAGESIZE then
          when the computer reaches the end of a page,
          instead of displaying "Insert next page" and
          waiting for the user to set up the page and press
          Return, it advances the paper to the top of the
          next page and continues without pause. The
          FORMSIZE instruction then is used to indicate the
          length of the form (in lines). Since the HyYype
          prints six lines per inch, the FORMSIZE is equal
          to the length of the form in inches times six. For
          example a form with pages 8.5" long would have a
          FORMSIZE of 8.5 x 6 = 51.

Ixxx   The INDENTATION attribute specifies the number of
          spaces that FORMAT is to indent at the start of a
          paragraph and can be anything between zero and
          half the width of the printed line.

Wxxx   The CHARACTER WIDTH attribute specifies the width
        of each printed character in 60ths of an inch. The
        default value of six results in text spaced ten
        characters per inch while a value of five will
        print 12 characters per inch. Other values can be
        used to produce compressed or expanded printing.
        4: This line has a character width of four.
        5: This line has a character width of five.
        6: This line has a character width of six.
        7: This line has a character width of seven.

Jx   The JUSTIFICATION attribute controls the
        justification of the printed text: if the value of
        JUSTIFICATION is zero then the text is not
        justified and appears much as it it had been
        printed with a typewriter. This paragraph, for
        example, is not justified. If JUSTIFICATION is
        non-zero then the spaces in each printed line are
        padded as required so that the last character of
        each line is at the right margin, e.g. all the
        other paragraphs above and below are justified.

N'--'   This instruction can be used to preset or modify
        the page number. Following the N there must
        exactly two characters enclosed in single quotes.

Ax   The AUTOMATIC FORMATTING attribute controls the
            type of formatting that is used to generate the
            printed output. When AUTOMATIC FORMATTING if on
            (A1), as it usually is, then FORMAT works as
            described under "Format Basics". If AUTOMATIC
            FORMATTING if off (A0) then each new line as read
            from tape will be printed starting on a new line.
            This can be useful when printing tables or other
            data which has a fixed format, where the output is
            to be an exact copy of the lines from tape.
            Turning AUTOMATIC FORMATTING off is logicaly
            equivalent to starting each line on tape with
            "{T0}". Although turning AUTOMATIC FORMATING off
            causes each line from tape to be printed on a new
            line, it does not mean that lines can run past the
            right margin; if you have long lines to print,
            then the right margin must be set accordingly.

H'---'   The HEADING ATTRIBUTE consists of up to 127
            characters and may contain any combination of
            text, CONTROL INSTRUCTIONS and KEYWORDS, but must
            not contain any single quotes and must all be on
            one input line. When using the "H" instruction to
            specify a new heading, everything between the
            single quotes is treated as a string of ordinary
            characters, CONTROL INSTRUCTIONS and KEYWORDS are
            NOT acted on immediatly, rather they are stored by

the computer and become the new HEADING ATTRIBUTE.

When FORMAT reaches the end of a page it saves the values of all the ATTRIBUTES and begins processing the HEADING ATTRIBUTE. When the end of the HEADING ATTRIBUTE is reached FORMAT restores the ATTRIBUTES that were saved and then resumes processing text where it left off. Since there are no special restrictions on the HEADING ATTRIBUTE, it can be used to create footings, headings or anything else the user wishes.

The default heading causes the page number to be centered at the top of the second and subsequent pages. It consists of

$${E,C}\neg pageno\neg{X1,T0}$$

and will serve as an example of how a HEADING ATTRIBUTE can work. The first instruction, an EJECT, directs FORMAT to set up the next page. There must always be an EJECT instruction somewhere in the HEADING ATTRIBUTE; any text which occurs before the EJECT will be printed at the bottom of the finished page as a footing while text that comes after the EJECT will be printed as a heading at the top if the next page. The CENTER instruction causes the definition of the KEYWORD ¬pageno¬ to be centered at the top of the new page. ¬pageno¬ is a special KEYWORD whose

definition is always the current page number. The value of the definition of ¬pageno¬ is incremented when the EJECT in the HEADING ATTRIBUTE is processed. The "X1" instruction leaves a blank line after the centered page number while the "T0" instruction suppresses the indentation which might otherwise occur as the

"{...}"

sequence normally indicates the start of a new paragraph.

Any number of heading formats are possible. To center the page number at the bottom of each page the HEADING ATTRIBUTE should be:

H´{C}¬pageno¬{E,T0}´

while to print "1..." at the bottom of the full page and "...2" at the top of the next page:

H´{C}¬pageno¬...{E,C}...¬pageno¬{X1,T0}´

would be required. If no heading or footing is required then H´{E,T0}´ would suffice. Note that any changes to attributes made during the processing to the HEADING ATTRIBUTE are local to the HEADING ATTRIBUTE and the previous attribute values are restored when the end of the HEADING ATTRIBUTE is reached. This property can be useful

when various margin settings are to be used in a single document. This page, for example, has different margin settings than some previous pages yet the page number is centered in the same place as on the other pages. This is because the HEADING ATTRIBUTE was set to

H´{L10,R75,E,C}¬pageno¬{X1,T0}´

which is similar to the default heading with the exception of the margin settings. Setting the margins in the heading keeps the position of the page number from wandering in response to changes in the page margins without altering those margins in the process.

Txxx   The TAB instruction directs the computer to move the print head to character position LEFT MARGIN + xxx. It is possible to tab to the left of the LEFT MARGIN by specifing a negative value for xxx thus, if the LEFT MARGIN is 10, T15 will cause the print head to tab to position 25, T0 will tab to position 10 while T-8 will tab to position 2.

Xxxx   Ths SKIP instruction causes the computer to leave xxx blank lines in the printed page. If xxx is greater than the number of lines left on the page, then the computer skips to the the bottom of the current page and starts a new page. No blank lines

are left at the top of the new page.

Bxxx   The BYPASS instruction tells the computer to suppress the printing of the next xxx pages. This can be used to skip the first part of a long document or to scan through an entire document to check for errors.

Exxx   The EJECT instruction can be used to force the start of a new page. The number following the "E" is optional; if it is omitted then the computer advances the paper to the bottom of the page and starts a new page. If there is a number following the "E" then the computer will EJECT if there less than xxx lines left of the current page, otherwise the instruction is ignored.

C   The CENTER instruction directs FORMAT to center the text that occurs between the current group of control instructions and the next group of control instructions. Thus

{...C}This is a test{...}

would cause the text 'This is a test" to be centered. The centering is done with respect to the left and right margins.

M'-'

The HYTYPE MODIFY instruction is of use when printing a document that requires the use of more than one print wheel. The HYTYPE MODIFY instruction causes the printing of a document to pause, giving the user a chance to change wheels on the HYTYPE, then printing is resumed when return is pressed. Typically the HYTYPE MODIFY is used with the semicolon so that printing can be halted in the middle of a line. When the MODIFY instruction is encountered while printing a line, the message "hytype modify x" appears on the display, where x was the character that followed the "M" instruction in single quotes. If the computer found the following text:

...this is a demonstration{;M'A'} of the HYTYPE MODIFY{;M'B'} instruction

it would print the text "this is a demonstration", then stop with the message "hytype modify A" on the display and then wait for the user to modify the Hytype and press RETURN. Upon receiving the RETURN the text "of the HYTYPE MODIFY" would be printed, the computer would stop in line once more with the message "hytype modify B" on the screen, then the rest of the text would be printed when RETURN was pressed.

Since the left brace "{" indicates the start of control instructions it is not printed; if you want to print a left brace the a double left brace "{{" is used. Thus "{{WOW}" would print as "{WOW}".

APPENDIX A

ERRORS AND ERROR MESSAGES

Text/700 does extensive error checking. When an error is found a message appears on the display indicating the nature of the error and the computer then waits for the user to take some action. Some errors can occur anywhere in the Text/700 system while others occur only during the formatting of a document.

Text/700 ERROR MESSAGES

Message: "source tape missing"

Cause: a source tape was required by LIST, EDIT or FORMAT and one was not found.

Options: mount a tape in the SOURCE drive to continue or interrupt the system to terminate the program that required the SOURCE tape.

Message: "destination tape missing"

Cause: a destination tape was required by INPUT or EDIT and one was not found.

Options: mount a tape to receive output on the DESTINATION drive to continue or interrupt the system to terminate the program that requested the destination tape.

Message: "destination tape protected"

Cause: the destination tape required by INPUT or EDIT is write
            protected and thus not available to receive data.

Options: write enable the tape to continue or interrupt the
            system to terminate the program that required the
            destination tape.

Message: "tape error"

Cause: an error was detected during all of five attempts to
            read a line of text from the SOURCE tape.

Options: when RETURN is pressed the computer will allow you to
            examine and modify the erronious line on the
            keyboard/display. Depending on the type of tape error
            encountered the line may contain only a single error or
            may consist entirly of garbage. The line will be
            accepted, with your modifications, when you press
            RETURN.

Message: "hytype error"

Cause: LIST or FORMAT was active but found there was no HyType
            printer attached to the system, or that the HyType was
            turned off.

Options: press RETURN to re-enter the monitor then connect a
            HyType and try again.

Message: "source tape id error"

Cause: the ID record on the SOURCE tape was missing or invalid. The tape is either damaged or not a tape containing a Text/700 document.

Options: interrupt the system to terminate the program that was trying to read the tape or press RETURN and continue with caution. FORMAT will assume the tape has no ID and try to carry on, while EDIT, unable to obtain the Tape Id and Creation Date from The SOURCE tape, will ask you to enter a new Id and Date.

FORMAT ERROR MESSAGES

Message: "ws full"

Cause: the workspace available to FORMAT is full. KEYWORDS, heading text and error correction text (see below) all require some area in the workspace, in addition the recursive use of a KEYWORD will fill the workspace i.e. if somewhere in the definition of a KEYWORD you include the KEYWORD itself then the program will recur until the workspace is filled.

Options: none. A "ws full" is fatal to the formatting of a document. Hitting RETURN will cancel FORMAT and return control to the monitor.

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The following messages indicate that FORMAT has found an error somewhere in the source text. When RETURN is pressed it will show as much text as it has available that will fit on the display and then place the cursor over the character that was being processed when the error was detected. You may use the keyboard/display to correct the error and then press RETURN. Since the user has complete control over the displayed error text and can change, insert and delete as much as desired, FORMAT needs some way of knowing with which character is should resume processing. Since it displayed the cursor over top of the last character processed, it resumes processing with the character that is under the cursor when you press RETURN. NOTE: it is very easy to correct the error and then automatically press RETURN without remembering to position the cursor properly; for this reason, after you press RETURN, the computer displays the message "position cursor" and gives you back the corrected line with the cursor as you left it. If you did leave the cursor in the wrong position you can now correct it. Upon pressing RETURN this time the computer resumes processing. This is the only occasion in the Text/700 system where the position of the cursor is of any importance when RETURN is pressed.

Message   "keyword error"

Cause: a keyword was found to contain a blank; this can also
          result from forgeting to put the closing "¬" at the end
          of the keyword.

Options: correct the keyword and then return control to FORMAT

with the cursor over the first "¬" of the KEYWORD.

Message: "range error"

Cause: the computer encountered a value that was too large or too small.

Options: correct the number so that it is within the range from -127 to 255 then return control to FORMAT with the cursor over the first digit of the number.

Message: "instruction error"

Cause: FORMAT was processing control instructions when it encountered an invalid instruction or instruction operand. The cursor will appear on top of, or immediatly to the right of, the instruction that was being processed when the error was detected. The following are the possible causes of the error

- A character which is not a valid control instruction, e.g. "t" or "z".

- The operand of an INDENTATION instruction being greater than half the current width of the printed page.

- A MARGIN setting that would make the LEFT MARGIN greater than the RIGHT MARGIN.

- A HITYPE MODIFY instruction that is not immediatly followed by a character in single quotes.

- Attempting to TAB past the RIGHT MARGIN

- Attempting to SKIP a negative number of lines

- An EJECT instruction with a negative operand

- A CHARACTER WIDTH instruction with a zero or negative operand

- A PAGE NUMBER instruction that is not immediatly followed by a two digit number in single quotes

- A HEADING instruction that is not followed immediatly by the new HEADING enclosed in single quotes

Options: correct the instruction and/or operand then return control to FORMAT with the cursor placed over the instruction character (NOT over the operand). The computer will then attempt to continue processing control instructions, starting with the character under the cursor.

APPENDIX B

Fun and games with KEYWORDS

SELF-DEFINING KEYWORDS

There are times when KEYWORDS are of use, not so much that they allow definition at format time, but that once defined they can be used many times throughout the document so that changing the definition of the KEYWORD causes all subsequent references to change as well. In such cases the SELF DEFINING KEYWORD can be of use. A SELF DEFINING KEYWORD is like an ordinary KEYWORD except that it contains its own definition as part of the KEYWORD. Ordinary KEYWORDS are of the form "¬xxxx¬", while SELF DEFINING KEYWORDS have the form "¬xxxx=dddd¬"; where xxxx is the name of the KEYWORD and dddd is its definition. When FORMAT encounteres a SELF DEFINING KEYWORD it substitutes the definition for the KEYWORD without pause; once defined in this manner, the KEYWORD can be referenced any number of times as an ordinary KEYWORD, that is "¬xxxx¬". The definition of a SELF DEFINING KEYWORD may contain spaces, but as with ordinary KEYWORDS, the name of the KEYWORD may not. In addition the entire KEYWORD and definition must be on one input line; if it runs over it will be arbitrarily terminated at the end of the input line, which may produce subsequent errors when the closing "¬" is encountered.

It is not possible to redefine a keyword within a given document; once a KEYWORD is defined, it should not be used in the self defining form, as doing so will produce unpredictable results.

KEYWORDS from tape

When an ordinary KEYWORD is encountered, the definition is requested from the Keyboard/Display however if there is a tape mounted on the right drive (usually the DESTINATION drive) when the KEYWORD is encountered, then the next line from that tape is taken as the definition of the KEYWORD. This facility is useful primarily to allow Text/700 documents access to data prepared using MCM/APL.

Size of KEYWORDS

The amount of space left for KEYWORDS in the workspace after the Text/700 system has been loaded is about 500 bytes (characters). The amount of space required by a KEYWORD is equal to the number of characters in the name of the KEYWORD plus the number of characters in the definition of the KEYWORD plus three.

APPENDIX C

BUGS

The following is a list of all known bugs in the current version (V01) of the Text/700 system:

1) If a group of CONTROL INSTRUCTIONS contains an EJECT followed by a SKIP instruction, then the SKIP instruction is ignored if the EJECT is taken. For example in the sequence:

{E,X12}

the "X12" instruction would be ignored. This problem can be bypassed by enclosing the SKIP instruction in its own set of braces, using semicolon to prevent a blank line:

{E}{;X12}