DTC MICRO FILE
Users
Manual

DTC MICRO FILE OPERATOR'S MANUAL

TABLE OF CONTENTS

I. A STEP BY STEP GUIDE TO GETTING STARTED

What to do when you first sit down at your Micro File-

This is written at a simple, nontechnical level. The supersophisticates among you are asked to forbear but NOT to skip this.

0. Set up the MICRO FILE per unpacking instructions.

1. Connect the terminal to MICRO FILE's DTE plug.

2. Plug MICRO FILE and terminal into electrical outlets.

   WARNING: The outlet on the MICRO FILE is for a coupler or similar approx. 100 watt device.

3. Check to make sure on the MICRO FILE back panel:

   A. The MODE switch is at ASYN.

   B. The baud, parity duplex and delay settings are consistent with the terminal being used.

   Example - with a DTC-300/S or DTC-302

TERMINAL		MICRO FILE	
LINE/LOCAL	in LINE	DELAY:	0
BAUD:	300	RATE:	300
DUPLEX:	FULL	DUPLEX:	FULL
AUTO LF:	OFF		
PLOT:	on or off		
CODE:	ASCII		

   PARITY should be the SAME on both MICRO FILE and terminal.

4. Turn on the terminal and MICRO FILE.

   "SYSTEM READY" will appear on the front of the MICRO FILE and, if terminal is on line,

   DTC MICRO FILE

   *

   will be printed on the terminal.

   * is the prompt for a system command.

5. The "HOST" button on MICRO FILE's front panel should be OFF (UNLIT).

6. Press MICRO FILE's RESET button. This will again cause "DTC MICRO FILE" to print.

7. Referring to FIGURE 1, insert the SYSTEMS DISK that came with your MICRO FILE in the DØ (left) slot.

   Insert a new disk in the D1 (right) slot.

   "READY" will appear in lights under "DISK Ø" and "DISK 1" on the front panel.

   NOTE: Make sure D1 (disk in right slot) can be written on. This means a strip covering the write-protect hole. See Figure 1.

8. As a protection, you will now copy DØ, your systems disk, onto D1 as a back up. Type:

   FO D1 C/R*

   (Response:)

   INSERT DISK...SET FORMAT ENABLE ON... DEPRESS C/R*

this you have already done	push the FORMAT ENABLE button; it will light.

   (Response:)

   NEW LABEL =

   You may now label (name) the disk. The label may be any alphanumeric up to approximately 124 characters. e.g. 7607 BACKUP DISK.

   If the disk has been used before, the response will be:

   LABEL = (some name)

   RE-FORMAT ?

   If this happens, type: N C/R*, remove the disk (See Figure 1), insert another and start over. (Unless you want to reformat, in which case type Y).

   *C/R = Carriage Return

The counter will display 0 to 76 as each of the disk's 76 tracks are formatted. On completion you will get:

```
FORMAT COMPLETE
*
```

The * is a prompt for another command.

Formatting is writing zeros on the disk and assigning addresses. Scratched, marred areas, are noted and will not be written on. Addresses of such areas are typed out during formatting.

The FORMAT ENABLE light will go out.

Next, type: RUN FCOPY C/R*

This will cause the entire contents of D0 to be copied onto D1. As each file is copied, its name and type will be printed at the terminal.

```
e.g.    $FO$  P  CREATED
        FCOPY P  CREATED
```

After all are copied the * prompt will be typed, indicating the MICRO FILE is ready for its next command. The counter shows the number of files copied.

Now eject D1 (See Figure 1), remove the strip, making the disk write-protected, place the disk in a protective jacket, and store in a safe place with the list of file names just printed (if you have a hard copy terminal).

*C/R = Carriage Return

II. SYSTEM OVERVIEW

Product Description--

The DTC Micro File consists of a CPU, a dual floppy disk, and an EIA Interface for a local terminal and remote computer access. It functions as a stand-alone system for local data processing jobs, an "intelligent" terminal for remote access use, or for a variety of other purposes conceived by the user.

The Micro File provides a basic set of tools and functions to enable users to build their own applications. Using the Micro File the user can:

* Create, modify and erase data files.
* Execute user-generated application programs.
* Transmit through the EIA Interface the contents of files (input and output).
* Alternately or simultaneously use the file system and the terminal to communicate with a remote system.

The DTC Micro File has the following features and functions:

* Provides a command language that the operator uses to control the system.
* Has a file management system that controls the allocation, cataloging, and access to data files. The file management system provides both a user command interface and a program interface.
* Supports several I/O Interfaces that user-generated programs can use.
* Has several file utilities for doing such things as file listings, copying, etc.
* Can communicate to a remote system through the EIA Interface. The logical protocol at this interface is basically one of emulating a paper tape transfer.

Summary of Normal Use--

The operator prepares the system for use by applying power, setting the HOST switch to the OFF position, and depressing the RESET switch. The system responds with the initial greeting message.

Next the operator inserts the disk(s) to be used during the current work session. One of the disks is typically a system disk (D0) containing the system programs and the other is usually the working storage disk containing only user files.

As soon as the disks are ready for use, the operator may use any of the System Commands described in section II. A reasonable thing to do at this point is to examine the status of the disk(s) with the FILES and SPACE commands. These commands show which files reside on the disk and how much space is still available.

If he discovers a file which may be discarded, he ERASES it. If he wishes to examine the contents of a text file, he PRINTS it. He can alter a text file with the EDIT command (and the Editor's subordinate command set) or he may invoke an applications program with the RUN command.

He can change the name of an existing file with the RNAME command. He may establish terminal input-editing characters with the CWL command.

Occasionally, it will be necessary to go "on-line" for brief periods with a remote computer. The Micro File acts like a conventional terminal to a remote system while the HOST switch is in the ON position.

Certain Micro File functions require the operator to toggle this switch to alternately communicate with the remote system and the local system. These situations are detailed in the System Commands descriptions.

User Program Environment-

The DTC Micro File contains an INTEL 8080 microprocessor CPU. Users can write special purpose programs and have them executed on the Micro File. Several commercial timesharing services provide programming language support for the 8080.

The basic (8k) Micro File system provides approximately 6k words for user programs, from address 2800_{16} to address $3FFF_{16}$. Not all of the highest addresses are usable, as the stack resides at $3FFF_{16}$ and downwards. A full set of terminal and disk I/O interface functions reside in the monitor and can be used by any program. A description of these functions may be found in the Programmer's Guide for the DTC Micro File.

Terminal Input Editing Conventions-

Line Editing-

This type of editing takes place on all lines being input from the terminal. They are simply procedures which permit the operator to back up in the input being provided, by deletion of a character, word, or entire line and to resume input with the specified correction in effect.

The characters shown are the default characters to be used for the indicated functions. A special command is provided to select a different set of characters for these functions. (See the description of the CWL command).

BS(backspace)	-	Deletes the preceding character from the line. Subsequent input will occupy the deleted character position. If already positioned at the beginning of the line, it has no effect.
DEL(delete or rubout)	-	Deletes the preceding word from the line. Subsequent input will occupy the first character position of the deleted word. If already positioned at the beginning of the line, it has no effect.
XC(control-X or CANCEL)	-	Deletes the line. Subsequent input starts a new line.

Line Termination-

A line of input is always terminated by CR/LF combination. If the TRANSPARENT switch is OFF, the operator need only provide the CR, and the LF is automatically appended by the terminal I/O Driver.

III. SYSTEM COMMANDS

The operator uses system commands to control the Micro File. The commands are introduced in response to the command prompt, a single asterisk (*), with the HOST switch in the OFF position. The operator is, in fact, communicating with a resident program which 'recognizes' the command and appropriately activates a program which performs the requested task. The reappearance of the asterisk indicates the preceding task has been accomplished and the operator may introduce the next command.

In a few instances, the command process is resident (FILES, GO, RUN, LOAD, SAVE), but in most cases the program resides on disk 0, and must be brought into RAM before it can be executed.

The retrieval of the program which is a command process occurs transparently to the operator due to the naming convention which has been applied to command processes. Each command-process program name consists of a $ as the first and fourth characters of the name with characters two and three corresponding to the first two characters of the command. The fifth character of the name is always blank. This technique allows "commands" to be added so long as naming conflicts are avoided. In other words, a command process is just a program which is loaded and executed as any other program, it is simply a candidate as a "command process" because of the name. Because of this, any command may be shortened to the first two characters of the command name.

The same general mechanism for loading programs is used whether it is a command process or an applications program. Note also that programs which are invoked by "command" are not necessarily executed in a common area, that is a separate issue.

About parameters-

A command consists of an identifying keyword (the first two characters are unique) followed by the relevant parameters. Parameters must meet certain restrictions:

1. Where a parameter is a hexadecimal entity it may not contain more than 4 characters and they must, of course, be hexadecimal digits.

2. Where DN is shown it must literally be D0 or D1*and identifies the disk to be considered. The default is always D0.

*D2 and D3 are valid on the MK IV Micro File.

3. Where FT is shown (and FT2) it represents a single character file type. The file types currently defined are T (text), P (program), B (BASIC), and R (random access).

4. FNAME is a 1 to 5 character name of a file. If more than 5 characters appear in the file name, only the first 5 are used.

5. Where a parameter is optional, it is shown enclosed in parentheses.

Failure to comply with the proper form of a command, causes 'CMDERR' to be printed.

Local System-Function Commands

The following paragraphs describe those system commands which deal strictly with the Micro File environment.

U
COPY FNAME FT DN FNAME2 (FT2 (DN2))

This command copies file 'FNAME FT' residing on Dn to Dn2 and names it 'FNAME2 FT2'. If DN2 is not specified, the new file is created on the same disk as the old file.

If the third character of the command is 'U' (update), any existing file FNAME2 FT2 DN2 will be erased and replaced with the new file.

Otherwise, the existence of FNAME2 FT2 DN2 causes the copy request to be rejected.

If FT is different from FT2 and either is 'P', 'R', or 'B', the copy request is rejected.

CWL

Set the character, word, and line delete characters. The program types:

CWL=

The next three characters entered become the character, word, and delete characters respectively. However, entering carriage-return only resets these characters to the default settings of BS (backspace), DEL (delete/rubout), and CAN (control-X or Cancel).

Letters, numbers, carriage-return, and line-feed cannot be used as delete characters.

DDUMP HEXFROM (HEXTO) (DN)

This command causes a hexadecimal representation of the contents of the disk sectors bounded by HEXFROM and HEXTO to be printed. HEXFROM and HEXTO are each comprised of four hexadecimal digits; the first two digits specify the track number and the second two digits specify the sector number. Each sector's data is preceded by its track/sector identity. Sectors which contain all zeros are not printed.

EDIT FNAME (DN)

This command invokes the Micro File Text Editor, and subsequent interactions are with that program. (See Section IV).

ERASE FNAME FT (DN)

This command deletes the file entry from the disk directory and restores its sectors to the allocation maps for subsequent reuse.

The EXEC Command

As the operator gains experience with Micro File he will encounter situations where he would like to submit a frequently used series of command statements rather than to introduce each statement separately. Such a facility is provided by the EXEC command.

EXEC FNAME (DN (ARG1...ARG4))
P

This command causes subsequent command statements to be retrieved from the file 'FNAME T'. The file is usually created with the EDITOR. The file may not, itself, contain EXEC commands, and its command statements may not be longer than 80 characters.

If the third character of the command is a 'P', the commands will be typed before they are executed, otherwise, they are not typed. If an error condition is encountered, the appropriate message is printed and command control reverts to the operator's terminal.

Argument substitution-

FNAME T may contain 'complete' command statements as well as statements into which the positional arguments (ARG1-ARG4) will be substituted. The positional arguments are referred to in the body of the statements as &1, &2, &3 and &4, the numeric referring, of course, to the relative position of the argument in the EXEC statements.

EXAMPLE:

If FNAME T contains:

```
PRINT &1 &3
PRINT &2 &3
```

then the statement:

```
EXP FNAME D0 LIST1 LIST2 D1
```

will cause:

```
PRINT LIST1 D1
PRINT LIST2 D1
```

Any argument reference for which there is no corresponding argument supplied, will be deleted from the EXEC statement.

FDUMP FNAME FT (DN)
X

This command causes a hexadecimal representation of the contents of the disk sectors which contain the specified file (FNAME FT) to be printed. The format of the printout is the same as in DDUMP. If the file specified does not reside on the disk, the message 'FILE NOT FOUND' is printed.

If FT is = 'R', then the third character of the command has the following meaning:

'X' = Dump the sectors containing the index structure.

other = Dump the sectors containing the records.

FILES (DN)

This command types a list of files that reside on disk n.

FORMAT DN

This command writes to all sectors of the disk. Its purpose is to create the basic structure of the file management scheme used in the Micro File system. All disks which enter the system must be structured in this manner. This command process prompts the operator for certain information or actions required of him and proceeds to format the disk. Messages which require some explanation are:

LABEL = XXXX.....

RE-FORMAT ?

These messages indicate that the label sector of the disk was read without error and found to contain the label XXXX.... The operator must respond to the 'RE-FORMAT' query with a message beginning with the character 'Y' if he wishes to continue with the formatting activity. Any other response terminates the activity.

GO (HEXLOC OR PARM1 PARM2...)

This command transfers program control to the address HEXLOC. If, however, the GO command was immediately preceded by a successful LOAD operation, program control is given to the LOADED program. In the latter case, the portion of the command statement beyond 'GO' may be interpreted by the loaded program as its parameters.

HTLOAD (HEXBIAS)

This command causes a "hex"* paper tape to be read at the operator's terminal and the program data thereon to be stored into RAM memory. It assumes, of course, that the operator's terminal is equipped with a paper tape reader. The HEXBIAS parameter is used to cause the data to be stored in an area of RAM other than that normally occupied by the data at program execution time. The data from the tape is stored at its origin address + HEXBIAS. The EOF* record on the tape signals the end of the operation. If a checksum error is detected while reading the tape, the message 'DATA ERROR' is printed, and the operation is prematurely terminated. The operator must then reposition the tape and again invoke the HTLOAD command. This command is generally used in conjunction with the SAVE command to introduce new programs, developed externally, to the Micro File system.

*Section VIII

LABEL (DN)

Reads the label from disk n and prints it. A new label may be entered. If no new label is desired, type ATTN/BREAK (or a lone carriage return) when the new label is requested.

LOAD FNAME (DN (HEXBIAS))

This command causes the program file 'FNAME' to be loaded into RAM but not executed. If a program file with the name 'FNAME' is not stored on the disk, the message 'FILE NOT FOUND' is printed. The HEXBIAS parameter is used in the same manner as the HTLOAD command.

MDUMP HEXFROM (HEXTO)

This command causes the memory range bounded by HEXFROM and HEXTO to be printed. Each line consists of a hexadecimal address followed by the sixteen bytes located at the address. Memory blocks containing the 'same' data are not printed.

NEW LABEL =

This message prompts the operator to provide the label to be written on the disk.

After the label is provided, the formatting of the disk runs to completion. The digital display is incremented as each track is formatted.

PATCH HEXFROM HEXBYTE HEXBYTE...

This command is used by the operator to store bytes of data into RAM beginning at the address HEXFROM and continuing for as many bytes as are represented in the command line. Each HEXBYTE is a hexadecimal digit or digit pair, bounded by blanks.

PRINT FNAME (DN)

This command causes the file FNAME T to be listed at the terminal. The digital display is incremented as each line is retrieved.

PX FNAME DN

This command allows printing files with X-on, X-off control from the terminal or file data (X-off).

RNAME FNAME FT FNAME2 (FT2 (DN))

This command changes the file name and file type of 'FNAME FT' to 'FNAME2 FT2'. If FT2 is not specified the file type remains the same. FT2 must be specified if DN is specified.

If FT is different from FT2 and either is 'P', 'R', or 'B', the rename request is rejected.

RUN FNAME (PARM1 PARM2...)

This command causes the file 'FNAME' to be loaded into RAM and executed. If a program file with the name 'FNAME' is not stored on disk 0, the message 'FILE NOT FOUND' is printed.

PARM1 and PARM2 are parameters being provided to the program.

SAVE FNAME HEXFROM HEXTO HEXLOAD (DN)

This command causes a file 'FNAME' whose file type is P (program) to be created and stored on the disk. HEXFROM, HEXTO and HEXLOAD are RAM addresses. The HEXFROM and HEXTO parameters specify the beginning and ending address of that area of RAM currently occupied by the program. The HEXLOAD parameter is generally the same as HEXFROM; it specifies the beginning RAM address to be used when subsequently loading and/or executing the program. HEXFROM would be different from HEXLOAD in the event a bias was used when loading the program.

If a program file with the name 'FNAME' is already stored on the disk, the message 'FILE ALREADY EXISTS' is printed. If the SAVE operation encounters an unrecoverable write error or exhausts the capacity of the disk, the message 'SAVERR' is printed, and if appropriate, 'SPACE EXHAUST'. In either case, the operator should then ERASE the file.

SPACE (DN)

This command reports the amount of space (number of free sectors) available on disk n.

Communications with a Remote Computer

The DTC Micro File is designed to be used with both a terminal and a remote computer, simultaneously. Separate controls are provided on the back panel for each connector. Different speeds, parity, and delay may be used. It is advisable to set the controls for the HOST (computer) connector to HALF-DUPLEX and 0 DELAY.

The HOST switch on the front panel is used to control the logical destination of characters typed at the terminal or input from the line. When "on", anything typed at the terminal is sent directly to the computer and anything received from the computer is sent directly to the terminal. The data is not seen by programs running in the Micro File. When the HOST switch is "off", data is directed to the terminal or computer.

When setting up a data transfer between the Micro File and a computer, the rule is to set up the receiving end first, then start the sending process. Six commands are available for transferring data between the Micro File and a remote computer:

HLLOAD (HEXBIAS)

This command is functionally similar to HTLOAD except that in this case the Micro File system assumes the role of a paper tape punch being driven by a remote system punching a "hex" tape (Section VIII).

Usage-

1. Issue the HLLOAD command.
2. Set the HOST switch to ON.
3. Interact as appropriate with the remote system to begin transmission of the hex-tape data. Provide the final host command, except for the terminating carriage return.
4. Set the HOST switch to OFF.
5. Depress the carriage return. At this point the remote system will begin transmitting the hex-tape data. As the data is received, it is stored into its appropriate memory locations. When all of the data has been received, the command prompt (*) will again appear at the terminal.

6. If the host system is no longer needed, set the HOST switch to ON temporarily, and disconnect from the Host (LOGOFF). Restore the HOST switch to OFF.

7. Issue the appropriate SAVE command to store the program on the local disk storage.

RCEIVE FNAME FT (DN)
P

This command is used to transfer a text file from a remote system into the Micro File system, and to assign it a name and file type.

If the third character of the command is 'P' the file will be printed at the terminal as it is received.

If FT is 'P', 'R', or 'B', the command is rejected.

The procedure for accomplishing the file transfer is as follows:

1. Use the RCEIVE command as described with the HOST switch in the OFF position. This prepares the Micro File for receiving the data from the line.
2. Switch to HOST and interact with the remote system to prepare it to transmit the file, providing everything required except the final carriage return.
3. Switch HOST to the OFF position and depress carriage return. At this point, the data will be transmitted. The digital display counts the lines as they are received.
4. When data transmission ceases, depress the break key to restore the normal "command mode" of operation.

RX FNAME DN
P

This command allows receiving of files from the communications line with X-on, X-off control from the Micro File.

SEND FNAME (DN)
P

This command will send the designated file from the Micro File to the remote computer. The file type must be T. To send a file, first set the HOST switch "on" and perform any commands necessary to place the computer in a receiving mode. Next, place the HOST switch "off" and type the SEND command. The Micro File will send the entire file to the computer. At the completion of the transfer the monitor prompt ('*') will be typed. Now set the HOST switch "on" again and complete any commands necessary for the computer.

If the third character of the command is 'P', the file will be printed at the terminal as it is transmitted.

In addition to normal termination, sending will be immediately terminated if either the computer or the terminal send BREAK (ATTN) to the Micro File.

SND FNAME (DN)
P

This command works exactly like SEND, except that the Micro File emulates a paper-tape reader. When an X-OFF character (control-S) is detected by sending program, transmission is suspended until an X-ON character (control-Q) is received from the computer. Typically, X-OFF characters are placed at the ends of input lines in paper-tape systems.

SX FNAME DN
P

This command allows sending files to the communications line with X-on, X-off control from the remote equipment (computer).

Special Port Speed Change Command

RA$^{L}_{T}$ RATE

This command allows setting the Line or Terminal baud rates by terminal command. Reset or power off will cause default to switch settings. Allowed rates are: 110, 150, 200, 300, 600, 900, 1200, 1800, 2400, 3600, 4800, and 9600.

IV. DTC MICRO FILE TEXT EDITOR

The Micro File Text Editor allows a user to create and modify text files on the DTC Micro File system. It is called by typing:

EDIT FNAME (DN)

'FNAME' is a 1-5 character name of the file. If it is longer than 5 characters, only the first 5 are used. A file type of 'T' (text) is assumed.

The editor will open the file, or create a new file if none exists. If a new file is created, the message "NEW FILE" is printed.

When ready to accept commands, the editor responds with a prompt of '-'. Any valid editor command may be given at this time. Several commands may be given on the same line separated by commas. Exception: No commands may follow the commands A, E, I or R, on the same line.

Each line of the text file is (implicitly) numbered. The first line is numbered 1. When a line is inserted into or deleted from the file, the numbering of all following lines is changed. The end of the text file is indicated by the message "(EOF)". The front panel display always shows the current line number. Line number 0 is considered a fictitious line, just preceeding the first real line. A line inserted at line 0 will be placed in front of the first line of the file (see Insert).

Most of the editor commands below may be followed by a repeat count, which is either a number or the single character '*', which means "as many as possible". If the count is omitted or is zero, the command is executed once. Otherwise, the command is executed as many times as the repeat count specifies.

Long running commands (such as search, replace, get) may be stopped by typing ATTN/BREAK.

Editor Commands

Positioning

T	(Top)	positions file to top. Current line is line 0.
B	(Bottom)	positions to the last line of the file. If the file is empty, positions to line 0.

nn	(Line nn)	positions to line nn where nn is a decimal number. A request to go to line 0 will be interpreted as line 1.
N or Nnn	D or Dnn	positions to next line down in the file. positions to nn lines down in the file or to the last line if encountered.
U or Unn		positions up one line in the file. positions up nn lines in the file.

Search/Replacement

'string' or "string" /string/	(Search)	starting at next line, search the file for a matching string of characters.
"string"="string2" /string/string2/	(String Replace)	starting at the current line, search the file for the next occurence of string, and replace it with string2.

Either delimiter (',") may be used for any string, but the same delimiter must appear at both ends of a string and cannot also appear within the string (" ' " is O.K. but " " " is not).

When one of these commands locates a requested string, the (modified) line is printed. If the command reaches the end of the file without finding the search string, any further commands input on the same line are ignored (but may be saved for processing by 'A').

Search/replacement commands may be followed by a repeat count (or *) if desired.

Deletion, Insertion, Replacement

Del	- delete current line
~~Dnn~~ Delnn	- delete nn lines, starting with current line.
~~D*~~ Del*	- delete all lines, from current line through end of file.
I(space) text	- insert "text" as a line immediately following the current line.

I(carriage-return)	-	Enter text insertion mode, following the current line. All subsequent input is inserted as text. You leave insert mode by pressing ATTN/BREAK. Any partial line input when BREAK was pressed is lost.
R(space) text	-	delete the current line and insert "text" as a line in its place.
Rnn(space) text	-	delete nn lines, then insert "text" in their place.
R*(space) text	-	delete the remainder of the file and insert "text" as the end.
R(carriage-return) Rnn(carriage-return) R*(carriage-return)	-	delete one or more lines, then enter block insertion mode (See Insert). The inserted text replaces the deleted lines.

For the I and R modes that have text as part of the command the first character of the text line inserted is the character following the single space in the command. A delimiter character other than space may be used (such as TAB), in which case, the inserted line includes the delimiter character.

Block input mode (for I and R) can be distinguished by the absence of the normal editor prompt character at the start of each line.

Intra-Line Editing

M - Modify lines
Mnn

This command is used to make changes within a line without having to retype the entire line. For each line to be modified, beginning with the current line, the editor prints a special prompt character ("=") and then enters a special intra-line editing mode that has its own commands. The commands typed in intra-line editing mode are not echoed at a full duplex or echoplex terminal. Hence, the line will appear on the terminal in nearly its correct form.

At the beginning of any line edit, the line is in a buffer in the Micro File and a pointer is pointing to its first character. In general, any of the commands below may be preceeded by a number, which will cause the command to be executed that number of times. A line to be modified may not be more than 253 characters in length.

Command	Type	Description
next -	space	Types the character under the pointer and moves the pointer to the right one character. Does nothing if the pointer is already at the end of the line.
back -	character delete	Moves the pointer to the left one character and echoes the "character delete" character (the character is not deleted though). Does nothing if the pointer is already at the beginning of line.
word -	word delete	Moves the pointer back over the previous word, and echoes enough "character delete" characters to do it. Does nothing if the pointer is already at the beginning of line.
Skip -	Sc	Moves the pointer to the right until the desired character ("C") is found, stopping just before the character. If S is preceeded by a number, n, the pointer is moved to the n-th occurrence of the character. All intervening characters are printed. If there are not n occurrences of the desired character, the pointer is not moved.
Kill -	Kc	This command works exactly like S, except the intervening characters are deleted from the line, and printed in "strikeout" fashion at the terminal (that is, each character is overstruck with "-" if the terminal has backspace capability).

Change - C	The next character typed replaces the character under the pointer in the line. The pointer is then moved right one place. If C is preceeded by a number, n, n characters are accepted. Typing ATTN/BREAK will always terminate C.
delete - D	The character under the pointer is deleted. A "struck-out" character ("-", backspace, character) is typed.
insert - I	Characters from the terminal are accepted and echoed until ATTN/BREAK is sent. The pointer is left after the inserted string. "Character delete" and "word delete" work normally (deleting) in this mode. It is possible to delete beyond the limits of the inserted string.
replace - R	Exactly equivalent to typing DI.
extend -X	Skips (and prints) to end of line, then enters Insert mode.
half-extend - H	Deletes (and prints "struck out" characters) to end of line, then enters Insert mode.
line - L	Prints remainder of line, then prints the modify prompt ("=") and resumes editing with the first character of the line.
print - P	Prints remainder of line, then prints the modify prompt ("=") and advances to the previous stopping place in the line. Useful for seeing what changes have been effected at this point.
finish - carriage return	Prints the remainder of the line, then replaces the line in the file copy with the revised line.
end - E	Like finish, but does not print the remainder of the line.

justify - J	Inserts a CR/LF (carriage return/line feed) into the line at the current position, and replaces the line in the file copy. The portion of the line to the right of the pointer is appended at the front of the next line of the file, and modify editing is started on that line. This is not considered a new line for line counting purposes (i.e. the repeat count on the M command). If the pointer is at the beginning of the line when the J command is entered, the line is merely appended to the next line and no blank line is created.
again - A or - line delete	Restarts editing of the current line with a fresh copy of the line. Very useful if mistakes have been made in editing.
quit - Q	Terminates editing and terminates the M command. The current line is not modified in the file.

Other Commands

A Ann A*	(Again)	Repeat the last previous command line that did not execute an 'A' command.
E	(Exit)	Exit the editor and complete updating of the file.
P Pnn P*	(Print)	Print one or more lines. The current line is the first printed, and the file is left positioned to the last line printed (so that "P" alone prints the current line but does not change the current line number).
PN > Pnn PN*	(Print Numbered)	This performs the same function as "P", except that each line is prefixed by a six digit line number, followed by a space.

print > Pnn NN = LINE NUMBER
PN* NN = # OF LINES

Get G filename Dn LN NN

STORE/STOW - S filename dn #-of-lines

EXEC Commandfile F filename dn

TABS 10 16 22 (set tabs)

TABD (display tabs)

TAB X (set tab char to X)

PX (Print with control) PXnn PX*	This performs the same function as "P", except that printing stops whenever an X-OFF character (Control-S) is encountered in the file. Input from the terminal is printed until an X-ON character (Control-Q) is typed, at which time the interrupted printing is resumed. This function is useful when typing form letters. Also, an X-OFF at the beginning and end of the document will allow the operator to change paper.

Merging Text Files

Lines from another text file may be included in the file being edited by means of the GET command:

G file-name (disk) (starting-line (number-of-lines))

The source file being used may be any type T (text) file except the file being edited. If the disk number is omitted, disk 0 is used.

If the starting-line and number-of-lines specifiers are omitted, the entire file is copied. If the starting-line is given but the number-of-lines is omitted, only the starting line is copied. A number-of-lines specification of '*' will copy from the starting line to the end of file.

Notes for the Advanced User

The editor defines a line as a string of characters terminated by (carriage-return) (line-feed). Isolated occurences of either character are not terminating. It is possible for the last line of a file to be missing a terminator.

Because of buffer limitations, any line longer than 255 characters (including the (CR) (LF) cannot be searched by the string search and replace commands. Such lines will be skipped during the search process.

Input lines can be any length. However, an isolated (CR) at a character position of 254 (or some multiple of 254) will have a (NUL) (00) character inserted after it so that it cannot be an end of line. This has no effect on the user, except for possible line numbering confusion in very rare cases.

A line editing (string replacement) command that changes the structure of the file (i.e.: creates a character pair (CR) (LF) where only (CR) or (LF) stood before may cause the line number counter to get out of synchronization with the file. Executing a "T" (Top) command will always correct this.

V. UTILITIES

Most of the functions in this category have been implemented as System Commands (See Section II for proper form):

DDUMP - Disk Dump

MDUMP - Memory Dump

FDUMP - File Dump

PATCH - Patch RAM Memory

COPY - Copy one file to another

FORMAT - Format a disk

However, there is one additional utility program which is very useful. It is invoked with the command:

```
RUN FCOPY (U)
```

FCOPY is a program which copies all files from D0 to D1. The presence of the 'update' parameter (U) causes existing files on d1 to be replaced.

VI. PANEL SWITCHES AND INDICATORS

Front switches-

RESET	Master clear for system.
HOST	Indicates the destination for characters typed at the terminal. In the ON position, (illuminated), data is sent to the HOST interface and is not interpreted by the Micro File system.
TRANSPARENT	When this switch is ON, any character typed in at the terminal is treated as text, and any associated control functions are suppressed (such as CR, character delete, word delete, line delete). A CR input with this switch on does not terminate a line and will not have a line feed echoed.
CONTROL DISPLAY	If this switch is on, control characters are not sent to the terminal directly (even in ECHO mode), but are converted first to ! BS (some character), where the character is the one associated with the control. Also DEL is converted to ! BS =. Exceptions: CR,LF, and any control characters defined as character, word, or line deletes (input only) are treated as usual.
FORMAT ENABLE	If this switch is on, the Disk I/O driver will permit the use of the FORMAT command. Otherwise, it is rejected as a disk command error.

Front Panel Indicators

Digital Display	The display is set to zeros each time the Monitor dispatches control to a program. Programs which run for a relatively long time use the display as an indication of program activity by counting lines, tracks, sectors, etc.
Disk Full	This indicator: 1) Remains off so long as the storage capacity of the respective disk has not been consumed beyond 80% of its total. 2) Flashes when the amount of storage consumed is between 80% and 90% of the total. 3) Remains on when the amount of storage consumed is greater than 90% of the total.
Disk Error	Turned on when a disk error is encountered. Turned off when error recovery is successful.

Rear Panel Switches

Both Lines

Rate	110, 300, 1200, 2400, 4800, 9600
Parity	ODD, EVEN, MARK, SPACE, NONE

Terminal Line Only

Duplex	FULL, ECHO, HALF
Delay	0, 100, 200, 400, 800 ms.

Notes:

1) "NONE" parity is 8-bit transmission. Others are 7-bit. Programs will mask to 7 bits when comparing characters, etc.

2) "FULL" Duplex - no echo in HOST mode
   echo in MICRO FILE mode

   "ECHO" Duplex - Micro File echoes in both modes
   (FDX Terminal to HDX Host)

   "HALF" Duplex - Terminal does its own echo.

3) Delay value is number of milliseconds to wait in data stream to terminal following LF or TAB sent. (After LF, so that CR LF becomes CR LF wait and not CR wait LF). For terminals that specify delay times in terms of character times, the following table is useful:

Speed (Baud)

Delay Switch	110	300	1200	2400	4800	9600
0	-	-	-	-	-	-
5	1	3	12	24	48	96
20	4	12	48	96	192	384

Character Times of Delay

VII. ERROR MESSAGES - GENERAL

?

The single question-mark message indicates the command statement is not a recognizable command. The statement is either shorter than the required 2 characters or the two characters do not represent one of the resident command processes nor can a corresponding system-command program file be found on disk 0.

CMDERR

Indicates an error in content of the command statement. The command must be re-issued with its correct parameters.

DSKERR N AT XXXX

This message indicates an unrecoverable error code N has been detected by the disk I/O driver at program location XXXX.

XXXX is a hexadecimal address.

N is one of the following codes:

1 = No drive present
2 = File inoperable
3 = Busy
4 = Not ready
5 = Write-Protected
6 = Sector Error
7 = CRC Error
8 = Positioning Error
9 = Disk I/O Command Error
: = Data Error after write

SYSERR AT XXXX

This message indicates a system error has been detected at program location XXXX. It should never occur. If it does, you should save all pertinent data and notify your supervisor.

VIII. HEX TAPE FORMAT

The hex tape consists of logical records which contain the object program, terminated by a record in a special form which signals the end of data (EOF record).

Each logical record of the tape has the following form:

Character Positions		Usage/Meaning
1	-	Always a colon (:). This character signals the beginning of a logical record.
2 → 3	-	Two-character hexadecimal representation of the number of bytes of object code contained in the record (N).
4 → 7	-	Four-character hexadecimal representation of the memory address to be occupied by the first byte of object code in the record.
8 → 9	-	Always zero characters. Reserved for future use.
10 → 10+(2N-1)	-	Object code bytes. Each byte is represented by a hexadecimal digit pair.
10+2N → 10+(2N+1)	-	Hexadecimal representation of the checksum. The checksum is the 2's complement of the sum (modulo 256) of all bytes on the record between the colon and the checksum digits.

EOF record structure

The EOF record is simply a colon followed by a series of 8 zero characters.

DTC
DATA TERMINALS AND COMMUNICATIONS

1190 DELL AVENUE
CAMPBELL, CA 95008
PHONE (408) 378-1112

ADDENDUM #1 TO DTC MICRO FILE USERS MANUAL

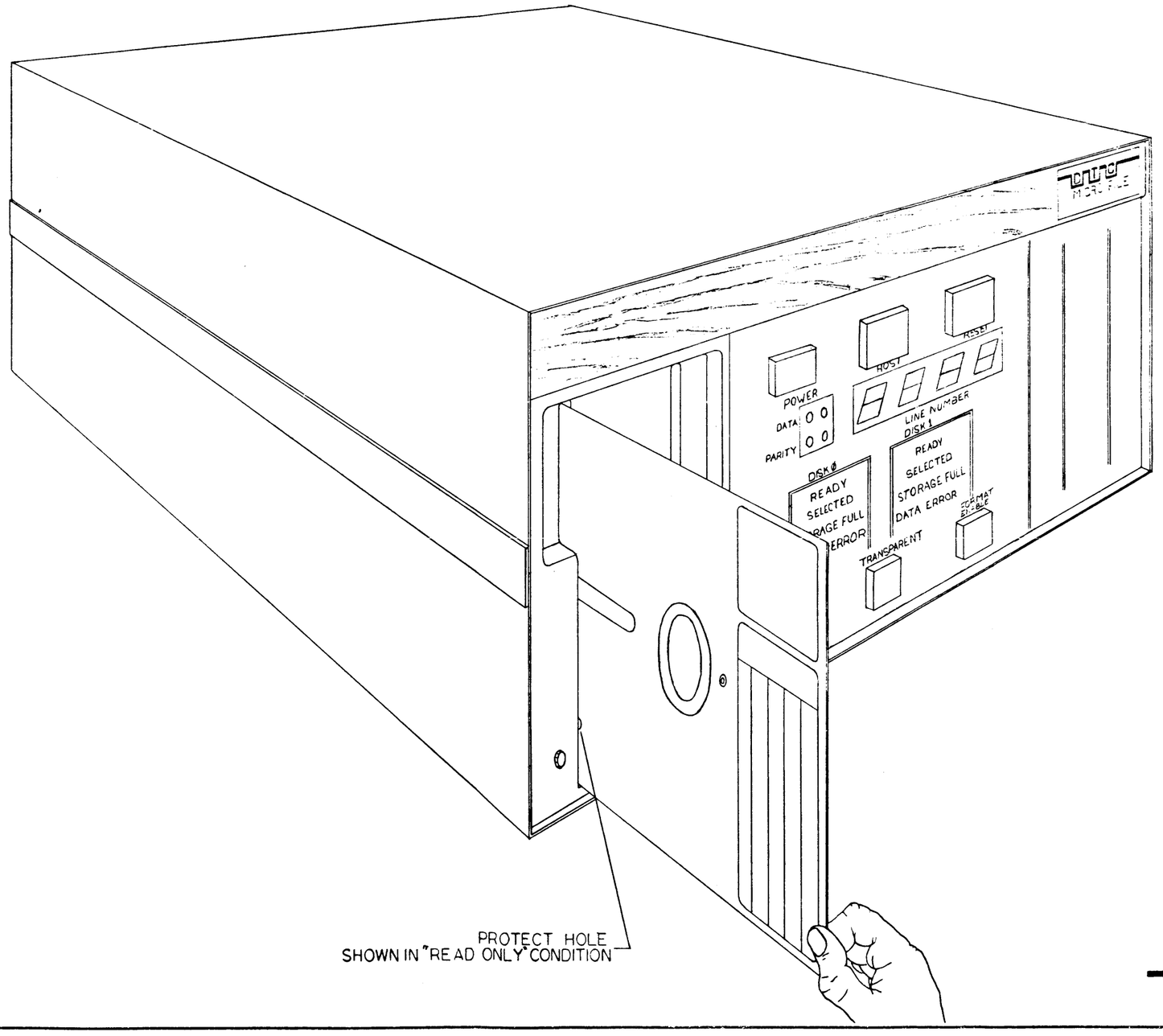
New System Commands

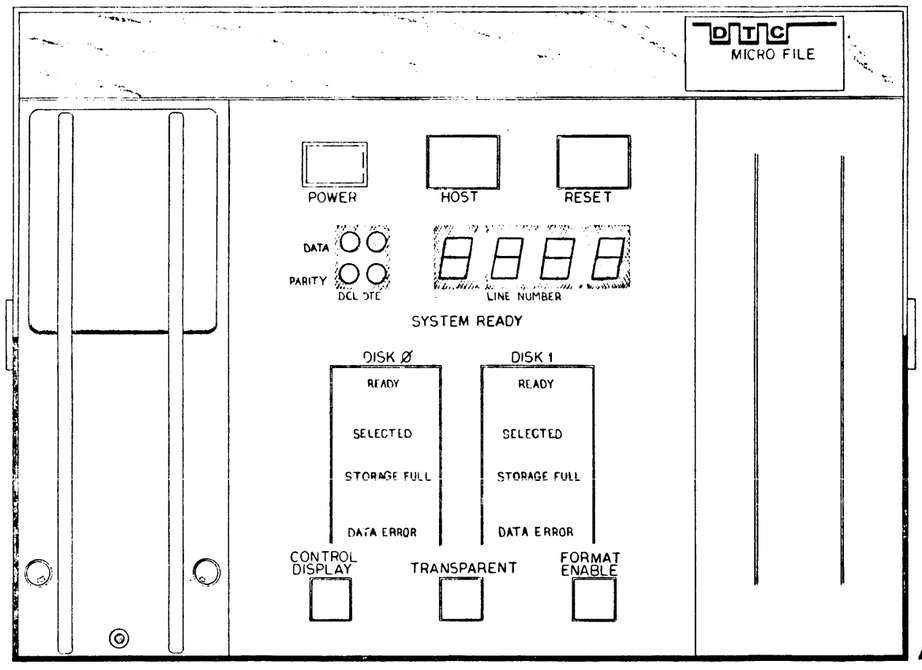
1. RX — A new version of Receive that sends XOFF and XON characters to the device sending the file (a complement of SX). Form is:

*RX$_P$ FNAME FT DN	Receive file using XON/XOFF control to sending device. (Optionally print while receiving)

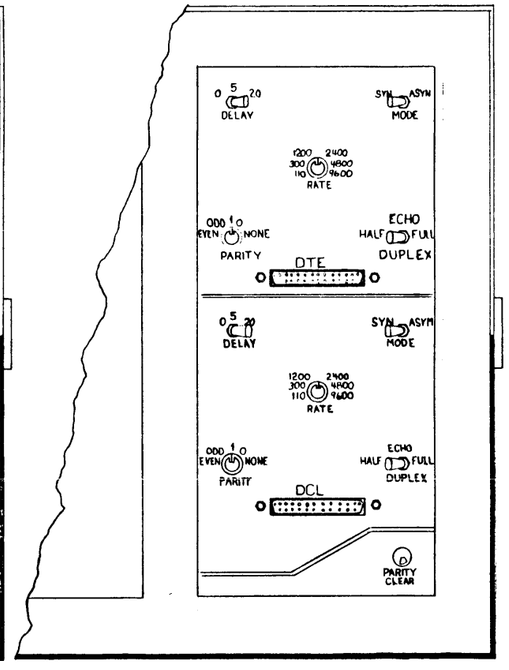
2. FL — Form of FIles command that lists files across the page forming 8 columns in 72 character lines. Optionally, this can be sent to the DCL port (Data Communications Line). This would be useful when a video terminal is on DTE and a hard copy device is on DCL. Form is:

*FL FNAME (DN)$_L$	List files across page. (Optionally send output to line).


MICROFILE
POWER
HOST
RESET
DATA 0 0
PARITY 0 0
LINE NUMBER
DISK 1
DISK 0
READY
SELECTED
STORAGE FULL
DATA ERROR
TRANSPARENT
PROTECT HOLE
SHOWN IN "READ ONLY" CONDITION



FRONT PANEL

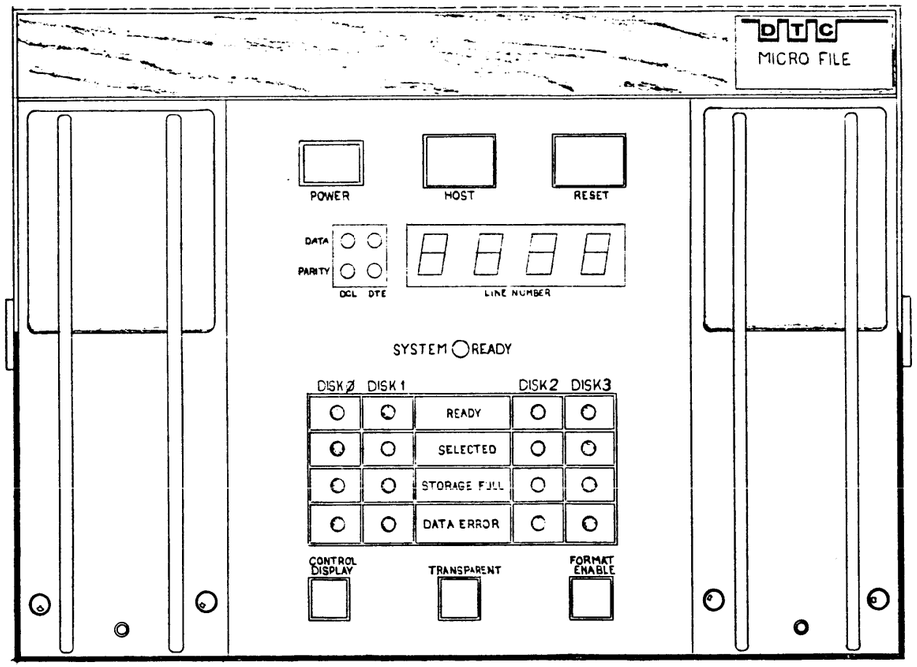


REAR PANEL

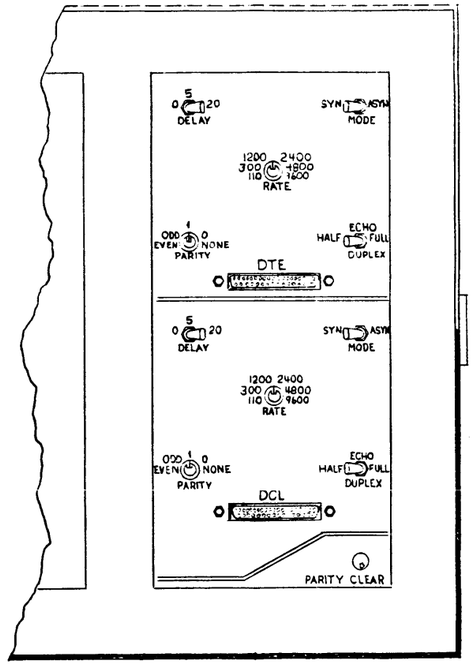
FIGURE 1A

MICRO FILE MK II

DATA TERMINALS & COMMUNICATION		
SCALE:	APPROVED BY:	DRAWN BY: ECB
DATE:		REVISED
MICROFILE FRONT & REAR PANEL		
DTC		DRAWING NO.



FRONT PANEL

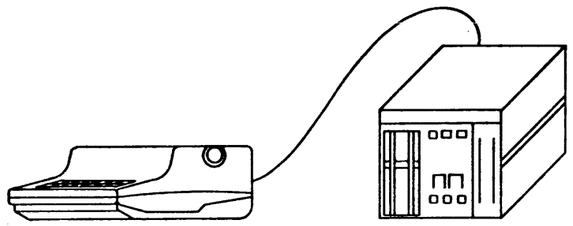


REAR PANEL

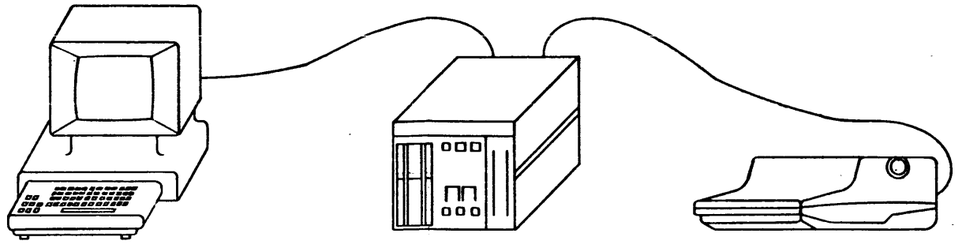
FIGURE 1B

MICRO FILE MK IV

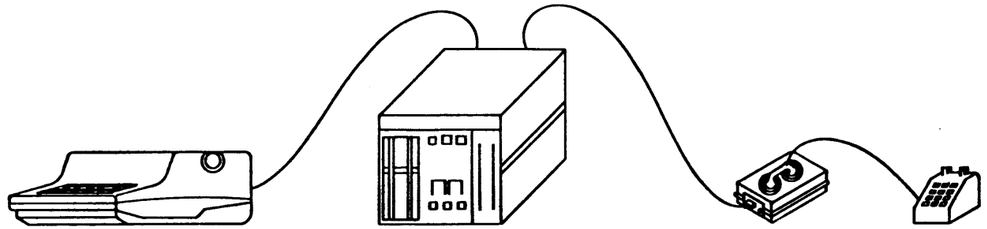
DATA TERMINALS & COMMUNICATION		
SCALE:	APPROVED BY:	DRAWN BY: E.C.B.
DATE:		REVISED
MICROFILE FRONT & REAR PANEL		
DTC		DRAWING NO.



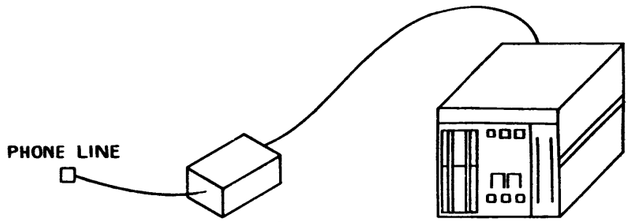
STAND ALONE SYSTEM



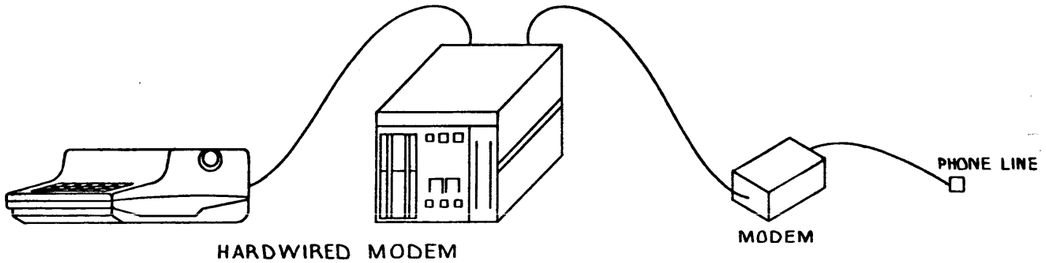
VIDEO DISPLAY AND RECIEVE ONLY PRINTER



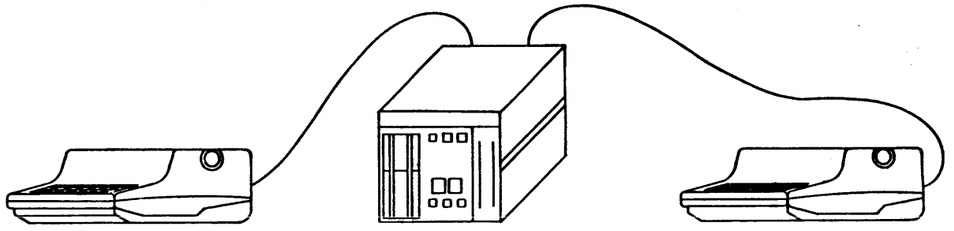
ACOUSTIC COUPLED



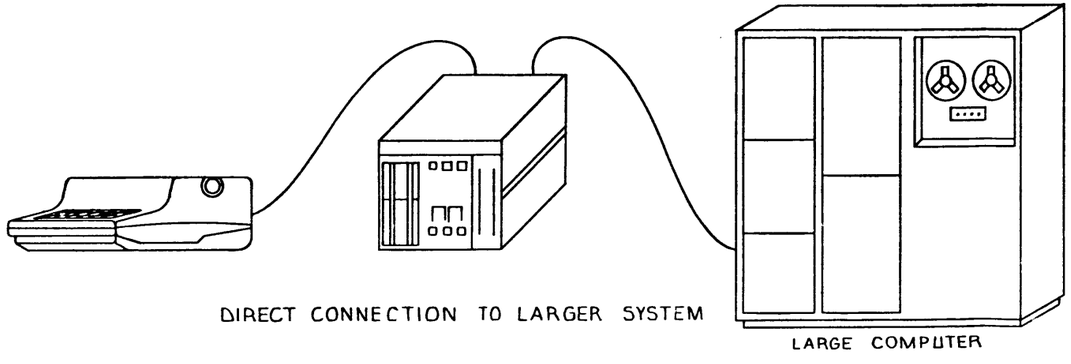
REMOTE LOCATION OF MICROFILE



HARDWIRED MODEM



TERMINAL TO TERMINAL



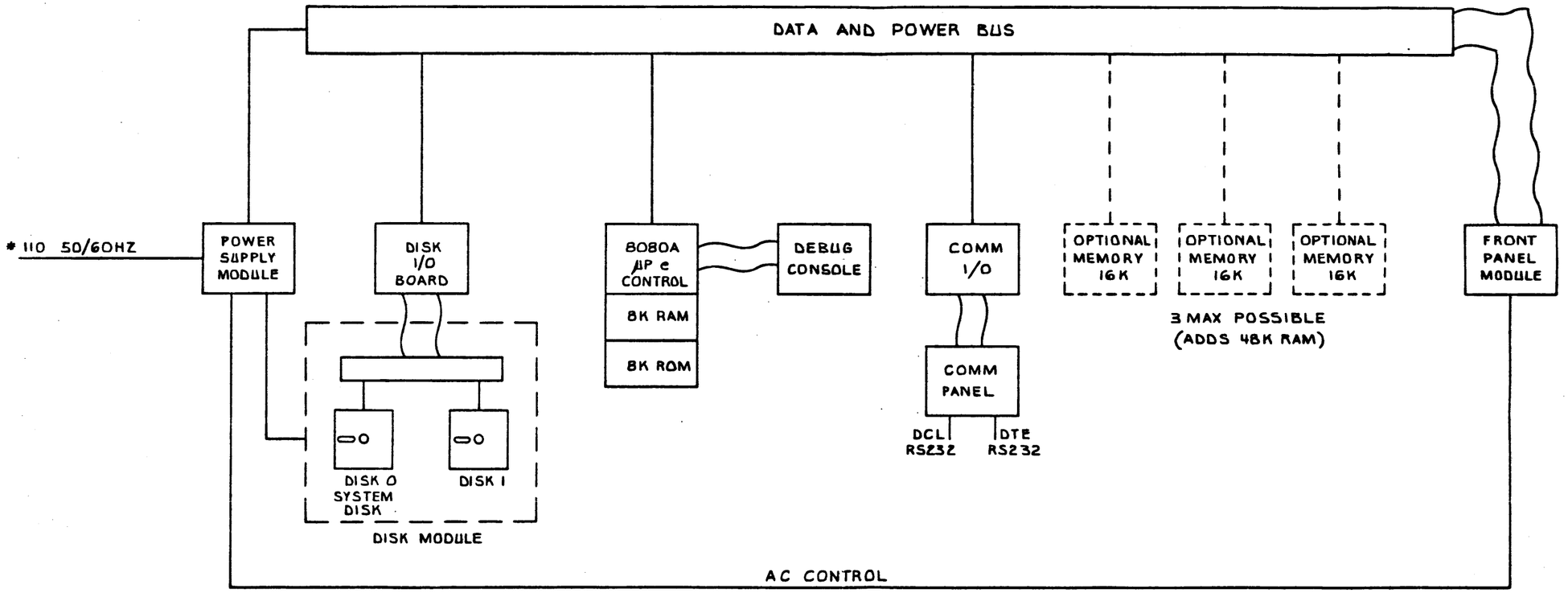
DIRECT CONNECTION TO LARGER SYSTEM

DATA TERMINALS & COMMUNICATIONS

SCALE:	APPROVED BY:	DRAWN BY J.G.
DATE:		REVISED

MICROFILE TYPICAL CONFIGURATIONS

DRAWING NUMBER



NOTES:
1. ~ = RIBBON CABLE
2. # 230 OPTIONAL

DATA TERMINALS & COMMUNICATIONS

SCALE:	APPROVED BY:	DRAWN BY J. G.
DATE:		REVISED

MICROFILE BLOCK DIAGRAM

DRAWING NUMBER

MICRO FILE INTERFACE PIN ASSIGNMENTS

	PIN#	FUNCTION	
D.T.E.	1	EARTH GROUND	
	2	DATA TO MICRO FILE	(T)
	3	DATA FROM MICRO FILE	(F)
	4	*REQUEST TO SEND	(T)
	5	CLEAR TO SEND	(F)
	6	DATA SET READY	(F)
	7	SIGNAL GROUND	
	9	+12 V. FOR TESTING	
	20	DATA TERMINAL READY	(T)

	PIN#	FUNCTION	
D.C.L.	1	EARTH GROUND	
	2	DATA FROM MICRO FILE	(F)
	3	DATA TO MICRO FILE	(T)
	4	REQUEST TO SEND	(F)
	5	*CLEAR TO SEND	(T)
	6	DATA SET READY	(T)
	7	SIGNAL GROUND	
	9	+12 V. FOR TESTING	
	20	DATA TERMINAL READY	(F)

NOTES:

* IF THIS PIN IS USED THE SIGNAL MUST BE TRUE (+) BEFORE THE MICRO FILE WILL TRANSMIT DATA. (THIS LINE MAY BE USED TO INTERRUPT DATA TRANSMISSION)

1 ONLY PINS 2,3,&7 NEED BE USED FOR OPERATION

2 (T)=TO MICRO FILE (F)=FROM MICRO FILE

3 IF THE D.C.L. PORT IS CONFIGURED AS A D.T.E. PORT BY INTERNAL JUMPER, USE D.T.E. ASSIGNMENTS TABLE

EIA RS232B/C PIN ASSIGNMENTS

1	AA	PROTECTIVE GROUND
2	BA	TRANSMIT DATA
3	BB	RECEIVE DATA
4	CA	REQUEST TO SEND
5	CB	CLEAR TO SEND
6	CC	DATA SET READY
7	AB	SIGNAL GROUND
8	CF	CARRIER DETECT
9	+P	+V. FOR TESTING
10	-P	-V. FOR TESTING
11	CY	ORIGINATE MODE
12	CX	LOCAL MODE
13-19		UNASSIGNED
20	CD	DATA TERMINAL READY
21		UNASSIGNED
22	CE	RING INDICATOR
23-24		UNASSIGNED
25	CN	TERMINAL BUSY