Chapter 1 GENERAL INFORMATION

This chapter explains procedures for starting the QX-10 MFBASIC and introduces the screen editor function which is used for entering BASIC programs.

Before following the procedures described below, use the CONFIG command of CP/M to set parameters such as the type of printer to be used, the RS-232C communication format, and the character set to be used. See the **QX-10 Operation Manual** for details.

1.1 Starting MFBASIC

Turn on the system power and insert the flexible disk containing the CP/M operating system and EPSON MFBASIC in drive A. When the system prompt ("A>") is displayed, type "MFBASIC" and hit the return key. This command, whose general format is explained below, loads MFBASIC and displays the following message.

```
EPSON MultiFonts BASIC vers X.X
Copyright 1977-1982 (C) by Microsoft and EPSON
Created: MM/DD/YY
XXXXX Bytes free
Ok
```

The "OK" displayed at the end of this message indicates that MFBASIC is at the command level; that is, it is ready to accept commands. At this point, MFBASIC may be used in either of two modes: the direct mode or the indirect mode.

Commands and statements entered in the direct mode are not preceded by program line numbers, and are executed immediately when the RETURN key is pressed. Since commands/statements entered in this mode are executed as they are input, the results of arithmetic and logical operations can be displayed immediately and stored for later use; however, the instructions themselves are lost after execution. This mode is useful for debugging and for using MFBASIC for quick arithmetic calculations that do not require a program.

The indirect mode is the mode which is used for entering programs. With this mode, the commands, statements, and functions making up program lines are preceded by line numbers; this causes their execution to be deferred until the program is executed (by entering the RUN command).

The general format of the MFBASIC command is as follows.

```
A>MFBASIC [<filename>][/F:<number of files>]
[/M:<upper memory boundary>]
[/S:<maximum record length>][/T:<stack area size>][/E:n]
```

All command operands indicated in brackets ([ ]) are optional; the functions of each form of the command are as described below.

(1) MFBASIC [<filename>]

Example MFBASIC EPSON

When the file name of a BASIC program is specified following MFBASIC, that program is loaded and executed upon completion of the MFBASIC command. See section 2.9 for further details on [filename].

(2) MFBASIC /F:<number of files>

Example MFBASIC /F:5

This example starts MFBASIC and sets the number of files which can be opened to 5. If this operand is omitted, the number of files which can be opened is set to 3 (the system default value). The maximum value which can be specified in <number of files> is 15.

Note that no file number specified in an OPEN statement can be larger than the value specified for <number of files>.

(3) MFBASIC /M:<upper memory boundary>

Example MFBASIC /M:&HC000

This example starts MFBASIC and reserves the memory area starting at hexadecimal address C0000H for storage of machine language programs. Naturally, this reduces the amount of memory which can be used for variables or storage of BASIC program text. In this example, the boundary address is specified as a hexadecimal number; however, it can also be specified as a decimal number. Further, the address specified must be lower than the starting address of the stack area specified with the /T: option (i.e., the value specified for the address must be less than E400H minus the value specified in the /T: option). See Appendix K **Memory Map**.

(4) MFBASIC /S:<maximum record length>

Example MFBASIC /S:256

This example sets the maximum record length of random files to 256 bytes. The maximum record length can be specified in either decimal, hexadecimal (&H), or octal (&O) notation; the system default value for the maximum record length is 128 bytes. Note that the record size specified in an OPEN "R" statement cannot be larger than the value specified for <maximum record length>.

(5) MFBASIC /T:<stack area size>

Example MFBASIC /T:256

This example sets the size of the stack area used by MFBASIC during calculation of expressions and execution of GOSUB/RETURN or FOR/NEXT statements to 256 bytes. The value specified for <stack area size> must be in the range from 256 to 1024 bytes. If this option is omitted, the value assumed is 512 bytes.

(6) MFBASIC /C:<buffer size>

Example MFBASIC /C:1024

This example sets the size of the receive buffers used during communications through the RS-232C interface(s) to 1024 bytes. When this command is executed, MFBASIC checks the number of RS-232C ports installed and automatically reserves one buffer of the specified size for each port. The value specified for <buffer size> must be in the range from 0 to 1024 bytes (use of the RS-232C ports is inhibited if 0 is specified); the value which is assumed if this option is omitted is 256 bytes.

(7) MFBASIC /E:n

Example MFBASIC /E:1

With the QX-10, error messages can be displayed in any of three languages (English, French, or German). This option specifies which of the three languages is to be used. English is selected by specifying 0 for n, French is selected by specifying 1, and German is selected by specifying 2. The example above specifies display of error messages in French.

If the /E: option is not specified, 0 is assumed and error messages are displayed in English.

1.2 Ending BASIC Operation

MFBASIC operation is ended and control is returned to the CP/M operating system by typing SYSTEM and pressing the RETURN key. (This command can also be executed from within a program.)

Example

```
10 ...
20 ...
30 ...
SYSTEM ↵
A>
```

1.3 Programming in MFBASIC

Every MFBASIC program consists of one or more program lines, each of which consists of a line number followed by one or more MFBASIC statements or functions. The commands and statements of MFBASIC are explained in Chapter 3, and the MFBASIC functions are explained in Chapter 4. An example of a MFBASIC program and the results of its execution are shown in the figure below.

```
10 CLS
20 PRINT "HELLO!"
30 PRINT "Greetings from the Epson QX-10"
40 END
Ok

RUN ↵

HELLO!
Greetings from the Epson QX-10
Ok
```

The numbers preceding program lines indicate the order in which lines are stored in memory, and are also referred to when branching from one program line to another in the program or when editing the program. Line numbers must be integers in the range from 0 to 65529. The general format of the program lines themselves is as follows (the square brackets indicate optional items).

Line No. BASIC statement[:BASIC statement...]

Each BASIC program line must begin with a line number and end with a carriage return, and may contain a maximum of 255 characters.

1.4 Keyboard

The keyboard of the QX-10 includes a number of special keys whose functions under EPSON MFBASIC are as follows.

[F1] to [F10]

F1 to F10 are used as programmable function keys. Any string of up to 15 characters can be assigned to these keys with the KEY command of BASIC or the PFKSET command of CP/M (the KEY command can also be used to output a list of the function key settings to the display or printer). See the explanation of the KEY command in Chapter 3 and the discussion of the PFKSET command in the **QX-10 Operation Manual** for details.

[PAUSE] or [CTRL] and [S]

The PAUSE key makes it possible to temporarily suspend listing of a BASIC program with the LIST command, or to temporarily stop execution of a BASIC program. The PAUSE condition is released by pressing any key other than BREAK or CTRL and C.

[SCRN DUMP]

This key outputs the contents of the display screen to the printer in bit image format. The function of this key is the same as that of the COPY statement.

[SF1] , [SF2] , [SF3] , [SF4]

With MultiFonts BASIC, pressing these keys makes it possible to select one of the QX-10's multiple character fonts.

[ESC]

This key has no function in the BASIC mode; however, the functions of this key are provided in BASIC by using the PRINT command in conjunction with CHR$(27). See Appendix C for ESC codes which can be used with MFBASIC.

[HELP]

This key has no function under MFBASIC.

[BREAK] or [CTRL] and [C]

Pressing the BREAK key (or CTRL and C) terminates execution of BASIC programs and returns MFBASIC to the command level; at such time, program execution can be resumed by executing the CONT command. This key also acts to terminate automatic program line number generation started with the AUTO command.
Operation of the BREAK key (or CTRL and C) can be inhibited or reenabled by means of the STOP KEY command.

1.5 Screen Editor

The screen editor is a function which is built into EPSON MFBASIC to allow text and graphics to be entered and corrected from the keyboard. This function is central to programming the QX-10 in the BASIC mode.

There are several methods of editing BASIC programs which have already been stored in memory. The most straightforward (although not necessarily the easiest), is to simply retype the line using the same line number. MFBASIC automatically replaces the old line with the new one when the RETURN key is pressed.

It is also possible to make changes in a line with the screen editor's control keys after displaying it with the EDIT or LIST commands. See the explanations of these commands in Chapter 3 for further details.

If you wish to erase all lines of a program in memory, enter the NEW command. This command is usually entered to clear the memory before entering a new program from the keyboard. However, this is not necessary when a program is loaded from a flexible disk with the LOAD or RUN commands; see the explanations of these commands for details.

A variety of keys are provided for use with the screen editor; these are described in the section below.

1.6 Keys Used with the Screen Editor

At the command level, pressing these keys moves the cursor in the directions indicated by the arrows on the key tops. These keys are equipped with a repeat function which moves the cursor at a steady rate when any of these keys is held continuously.

TAB or CTRL and I

Pressing this key moves the cursor to the next tab position on the screen. Every eighth column is a tab position, starting with the column on the far left side of the screen.

BS or CTRL and H

Pressing the BS (backspace) key deletes the character immediately to the left of the cursor and moves the remainder of that logical line to the left by one character position. This key does nothing if pressed while the cursor is at the beginning of a logical line. †

CTRL and B

Pressing these keys together moves the cursor to the first character of the word preceding its current position. For the purpose of this function, a word is any group of letters which is separated from other letters by a space or special characters.

CTRL and F

Pressing these keys together moves the cursor to the first character of the word following its current position.

CTRL and X

Pressing these keys together moves the cursor to the position following the last character in the current logical line.

HOME or CTRL and K

Pressing this key returns the cursor to the home position without clearing the screen.

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† A logical line is a line which is handled by the MFBASIC as one logical unit. A logical line may consist of any number of lines on the display screen, and is normally terminated by pressing the ↵ key. Logical lines are automatically continued during typing when the cursor moves from the right side of the screen to the beginning of the following line. This applies regardless of whether cursor is moved by typing characters or spaces, or by means of the TAB key.

DEL

Pressing the DEL key deletes the character at the position of the cursor and moves the remainder of the logical line to the left by one character position.

CTRL and E

Pressing these keys together deletes all characters from the cursor position to the end of that logical line.

CTRL and Z

Pressing these keys together deletes all characters from the cursor position to the end of the screen.

CLS or CTRL and L

This key clears the entire screen and moves the cursor to the home position (the upper left corner of the screen).

*INS or CTRL and R

Pressing this key once places the editor in the insert mode; pressing it again, (or pressing any of the cursor control keys or the RETURN key) restores normal operation. In the insert mode, the cursor and characters from the cursor to the end of the logical line are moved to the right by one position when any character key is pressed; the character entered is then inserted at the cursor's former position. The red LED built into the top of this key lights when the screen editor is in the insert mode.

 or CTRL and M

Pressing this key executes direct commands on the logical line in which the cursor is located or stores program lines, in the computer's program text area. Operation is the same no matter where the cursor is located in the logical line.

BREAK or CTRL and C

Pressing this key in the command mode moves the cursor from the logical line in which it is currently positioned to the beginning of the next logical line. This key is also used to terminate automatic program line generation by the AUTO command.