

## Chapter 7 System Functions

The MAPLE provides the following six system functions in addition to the standard CP/M functions:

- 1) Password
- 2) Auto Start String
- 3) Menu
- 4) Resident
- 5) System Display
- 6) Auto Power Off

This chapter describes the six system functions.

## 7.1 Password

The operation of and specifications for the Password function are described in "OS Specifications". This section describes how to set or cancel a password in an application program. The contents of the password specified in the following work area is held intact until the next system initialization:

- PASFLG: Overseas version = 0F01DH

Japanese-language version = 0ED1DH

This flag indicates whether a password is defined or not.

= 00H: No password defined.

≠ 00H: Password defined.

- PASWRD: Overseas version = 0F01EH

Japanese-language version = 0ED1EH

This 8-byte area is loaded with the password in the complemented form.

Note: When the password is canceled with the PASFLG set to 00H, all of the eight bytes starting at the PASWRD must also be padded with "?" marks. This is because MTOS will copy this password onto tape.

## 7.2 Auto Start String

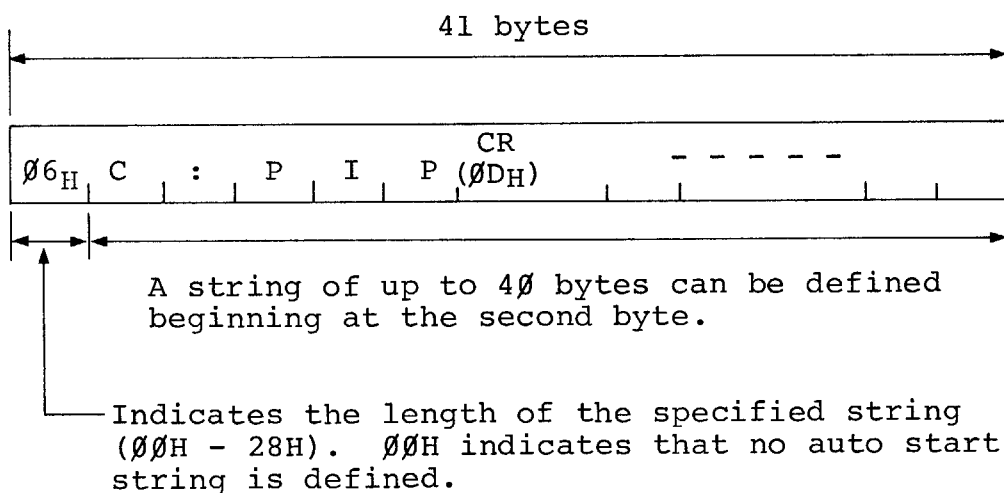
The Auto Start String function loads a predefined auto start string into the key buffer when a warm boot is initiated by a power on and processes it as if it were entered from the keyboard. This function is useful for users who wish to run a specific program every time they start their system or those who want to use the MAPLE as a turn-key system.

This section shows how to define and cancel an auto start string in an application program. Refer to "OS specifications" for the operation of and specifications for the Auto Start String function.

- AUTOSTRT: Overseas version = 0F3D6H

Japanese-language version = 0F14BH

The auto start string is loaded in the buffer area at the above location in the following format:



An auto start string may consist of up to 40 bytes including control codes if the string is to be defined directly in the work area. The length of the actual string, however, must be shorter than 40 bytes if control codes are included because a control code is displayed by two characters on the system display.

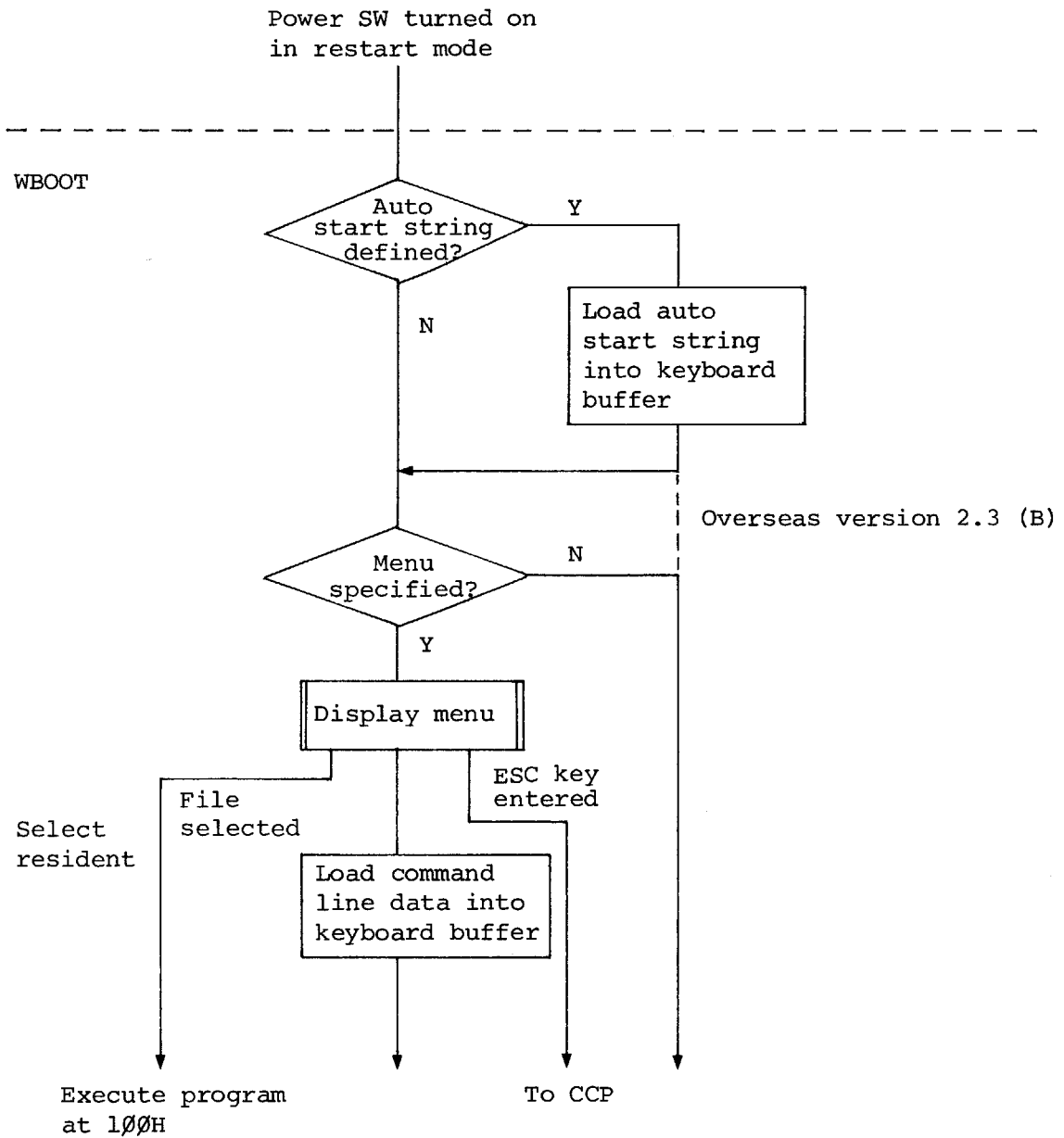
The contents of in the work area is cleared during system initialization.

\* Auto start string and menu display

In Overseas Version 1.0 and Japanese-language Version, the auto start string is treated in the same way as keyed in data on the menu screen command line. This necessitates the user to be aware of where the auto start string will work (on the menu screen or as a CCP command).

In Overseas Version 2.3 (B), on the other hand, if an auto start string is stored in the keyboard buffer, it always works as a CCP command, whether it is displayed on the menu screen or not. The user, therefore, need only define the auto start string as a CCP command.

The figure below shows how WBOOT processes the auto start string.



### 7.3 Menu

This section explains how to define and cancel a menu in an application program. Refer to "OS Specifications" for the operation of and specifications for the menu function.

- MENUFG: Overseas version = 0F02AH

Japanese-language version = 0ED2AH

This flag indicates whether a menu is to be displayed during WBOOT processing.

= 00H: Menu displayed.

≠ 00H: No menu displayed.

MENUFG is initialized to 00H.

- MENUDRV: Overseas version = 0F02BH

Japanese-language version = 0ED2BH

The 8-byte area starting at the above address is loaded with the ASCII codes corresponding to the drives of which the directory is to be loaded. Lowercase letters are converted to uppercase letters. The MAPLE supports drives A through H (A through I for Overseas version 2.3 (B)). Specify letters from A through H or I. If a letter is specified more than

once, the MAPLE will display the directory of the corresponding drive the number of times equal to the number of occurrence of the letter. Any letters other than A through H (or I) are ignored. This area is initialized to "CBA\_\_\_\_" (ICBA\_\_\_\_" for Overseas Version 2.2 (B)).

- FTYPETBL: Overseas version = 0F036H

Japanese-language version = 0ED37H

The 12-byte area starting at the above address is loaded with the file types of the files that are to be displayed in the menu. Specify up to four 3-character file types. A file type of three blanks is treated as undefined.

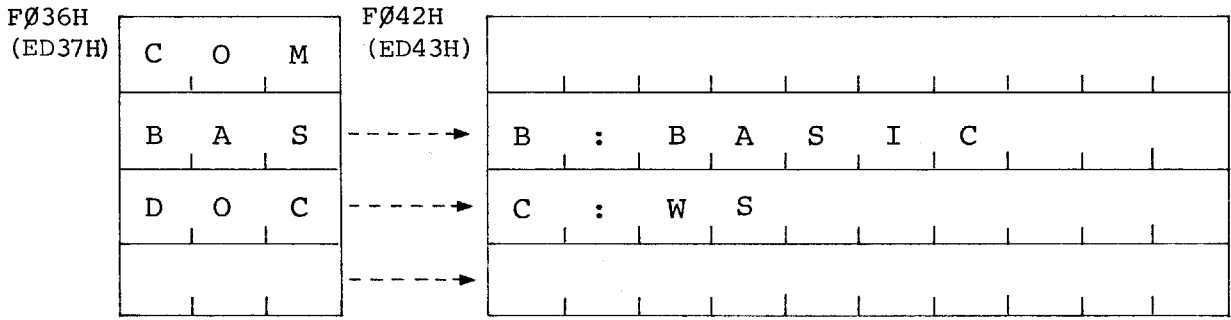
- FNAMETBL: Overseas version = 0F042H

Japanese-language version = 0ED43H

The 40-byte area starting at the above address is loaded with the file names (10 characters including the drive name) of the COM files that are to be displayed in the menu. Specify up to four file names.

FTYPETBL

FNAMETBL



FTYPETBL is initialized to "COM"; the remaining 9 bytes are padded with blanks.

Initialized to all blanks.

In the above example, the menu displays files which have a file type of either ".COM," ".BAS," or ".DOC." When the user select a file having a file type of ".BAS" with cursor keys, the message "B:BASIC\_\_" is displayed at the beginning of the command line, followed by the name of the selected file. The menu function then waits for key entry. When a file with a file type of ".DOC" is selected, the message "C:WS\_\_\_\_\_" is displayed at the beginning of the command line. When a file with a file type of ".COM" is selected, no data is taken from FNAMETBL and only the specified file name is displayed on the command line starting at its beginning.



The contents of the above work areas can be set by menu file specification in System Display. The work areas are initialized during each system initialization and their contents are preserved until the next system initialization.

Only the BS edit function is effective on the command line.

#### 7.4 Running Resident Programs

If the address MTPAFG is loaded with a value other than zero, the comment "(resident)" is displayed following the first file (the file on the upper left position on the first page) of the menu.

When this file is selected from the menu, the OS will load no transient program but transfers control directly to the program already in memory at address 100H. This function is used to eliminate the time required to load a program from a disk drive. The resident function is enabled only when the menu is displayed. BASIC takes advantage of this function.

- MTPAFG: Overseas version = 0F035H

Japanese-language version = 0ED36H

Indicates whether the resident function is to be enabled during menu processing.

= 00H: Resident function disabled.

≠ 00H: Resident function enabled.

MTPAFG is initialized to 00H.

If the program to be executed at address 100H is programmed to set this work area to zero at its beginning, it displays the contents of the

MTPAM at the beginning of the menu when it terminates execution with the WBOOT routine. If the contents of the MTPAM is selected in the menu, the program at address 100H starts execution immediately.

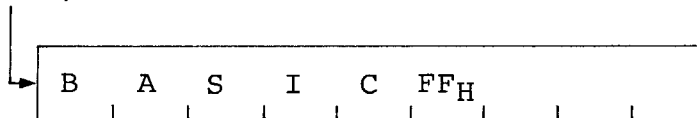
This work area is automatically cleared to zero by the OS when the menu function is exited.

- MTPNM: Overseas version = 0F0B4H

Japanese-language version = 0F229H

This 9-byte area is loaded with the message to be displayed at the beginning of the menu. The message must be terminated by an 0FFH. The user can specify not longer than 8 characters. This area must always be filled when MTPAFG is set to 00H. BASIC assumes the following message in MTPANM:

F4B4H  
(F229H)



The following message will then be displayed at the beginning of the menu:

BASIC (resident)

## 7.5 System Display

Refer to "OS Specifications" for the use of the system display function.

As explained in Chapter 5, "keyboard," this function is invoked as a subroutine from a BIOS keyboard routine when the HELP key is pressed while holding down the CTRL key. This means that if the application program executes neither BDOS nor BIOS keyboard routines (CONST, CONIN, etc.), this function will not be started whenever the CTRL/HELP keys are pressed.

The system display function provides the following subfunctions:

- 1) Password processing
- 2) Alarm/wake processing
- 3) Auto start string processing
- 4) Menu processing
- 5) MCT processing
- 6) Manual MCT processing

### 7.5.1 Password

The password system display function defines, cancels, or displays a password using the work areas described in 7.1.

### 7.5.2 Alarm/Wake

The alarm/wake system display function sets, resets, and displays the status of the alarm/wake function using the TIMDAT internal BIOS function. This system display function, however, has the following restrictions compared with the alarm/wake BIOS function:

- (1) The time can be set only in minutes (the second field is set to 0). (The BIOS function allows the time to be set in 10-second units.)
- (2) The day of the week is not supported (the day of the week field in the time descriptor is set to 0FFH). Only the month, the day, and the time are supported.
- (3) Only WAKE1 is supported (specifying WAKE2 is invalid).

For further information, see Chapter 4, "BIOS Functions" and Chapter 8 "Alarm/Wake Function."

#### 7.5.3 Auto Start String

The auto start string function defines, cancels, or displays an auto start string using the work areas described in 7.2.

#### 7.5.4 Menu

The menu system display function defines, cancels, or displays a menu using the work areas described in 7.3.

#### 7.5.5 MCT

The MCT system display function sets the following two modes:

- Stop/Nonstop mode
- Verify mode

1) Stop/nonstop mode

The MCT system display function specifies whether tape blocks are to be fed in the stop or nonstop mode when writing a file onto tape using the work areas described below. The mode used for writing a file on MCT tape is used when the file is read from the MCT tape (the mode, however, can be changed by rewriting the work areas).

See Chapter 14, "MTOS/MIOS Operations" for details on the stop/nonstop modes and related work areas.

- DFTATR: Overseas version = 0F2E0H  
Japanese-language version = 0F01DH
- TACATR: Overseas version = 0F78FH  
Japanese-language version = 0F70CH

In both work areas:

A 1 in bit 7 specifies the stop mode.

A 0 in bit 7 specifies the nonstop mode.

DFTATR is initialized to '11000010B'.

Both work areas must be updated simultaneously when the mode is to be changed.

## 2) Verify mode

The MCT system display function also specifies whether the contents of the tape are to be verified after a write operation. When verify mode is specified, after closing the written file, the MTOS/MIOS rewinds the tape, reads the file blocks on the tape, and compares the CRC bytes with those in memory for each tape block. It does not verify data itself.

See Chapter 14, "MTOS/MIOS Operations" for details on the verify mode.

- VERFDFLT: Overseas version = 0F07BH

Japanese-language version = 0F036H

- VERFFG: Overseas version = 0F07CH

Japanese-language version = 0F737H

The use of both work areas are the same:

= 0FFH turns on the verify mode.

≠ 0FFH: turns off the verify mode.

These work areas are initialized to 00H. They must be updated simultaneously when the mode is to be changed.



### 7.5.6 Manual MCT Operation

The system display function executes as follows when the user controls MCT operations with PF keys:

1) PF1 (FF)

Executes the internal MIOS function 06H (FF).

2) PF2 (PLAY)

Executes the following functions sequentially:

i) MIOS function 0BH (HEAD ON).

ii) MIOS function 04H (PLAY).

iii) 7805 command 72H (with 10000000B as parameter) to turn on the speaker.

3) PF3 (STOP)

Executes the following functions sequentially:

i) 7805 command 72H (with 00000000B as parameter) to turn off the speaker.

ii) MIOS function 03H (STOP).

iii) 7805 command 0CH (HEAD OFF)

4) PF4 (REWIND)

Executes the MIOS function 08H (REWIND).

5) PF5 (RESET COUNTER)

Executes the MIOS function 02H to reset the tape counter to 0.

6) PF6 (REMOVE)

Executes the MTOS function 252 (REMOVE).

7) PF7 (MOUNT)

Executes the MTOS function 253 (MOUNT).

8) PF8 (DIRINIT)

Executes the MTOS function 255 (MAKDIR).

9) PF9 (ERASE)

Executes the MIOS function 15H (ERASE) to erase the tape.

Care must be taken with the following when operating the MCT manually:

- 1) No manual operation on the MCT is allowed when a file on the MCT is open. Whether a file is opened or not can be identified by checking the following work area:
  - OPNMOD: Overseas version = 0F361H
  - Japanese-language version = 0F0A8H
  - = 00H: No file is open.
  - = 01H: A file is opened in the read mode.
  - = 02H: A file is opened in the write mode.
- 2) Operations other than remove are not allowed when a MCT is mounted but no files are opened. This is because any operation other than remove will affect the counter value.
- 3) Any operation is allowed when no MCT is mounted.

Whether the MCT is in the mount or remove state can be identified by checking the following work area:

- TAPMOD: Overseas version = 0F2DDH

Japanese-language version = 0F01AH

= 00H: Remove state

= 01H: Mount state

- 4) While the Z80 proceeds to the next instruction immediately after calling an MIOS function, the slave CPU continues to execute the MIOS function after it is invoked. Accordingly, the calling program, after calling an MIOS function, must monitor the state of the MCT and terminate the MIOS function at a necessary point. Terminating an MIOS function can also be done using an MIOS function (e.g., a function equivalent to PF3 (STOP)).

See Chapter 14, "MTOS/MIOS Operations" for details on the MTOS and MIOS functions and Chapter 13 "Slave CPU Operations" for detailed discussion of the slave CPU functions.

### 7.5.7 Other Information Displayed by System Display Function

#### 1) Clock on first line

The system display function reads and displays the present time using the TIMDAT BIOS function.

#### 2) Disk size on third line

The RAM disk size in bytes is stored in the following work area in binary format:

- YSIZERAM: Overseas version = 0F6A8H

Japanese-language version = 0F42BH

#### 3) User BIOS size on fourth line

The user BIOS size in 256-byte units is stored in the following work area in binary format:

- USERBIOS: Overseas version = 0F00BH

Japanese-language version = 0ED0BH

#### 4) Tape counter value on fourth line

The system display function reads the tape counter value using the MIOS function 01H (REDCT).

## 7.6 Auto Power Off

To save power, the MAPLE automatically turns its power off in the continue mode if it receives no data from the keyboard within a predetermined time while it waits for keyed-in data with the CONIN BIOS function. When its power switch is turned off and back on again, the MAPLE resumes its operation at the point where it was waiting for keyed-in data. This feature is called the auto power off function.

The auto power off function and its interval can be specified in the following work areas:

- ATSHUTOFF: Overseas version = 0F026H

Japanese-language version = 0ED26H

Contains (in binary form) the interval in minutes between the time the last key is pressed and the time the power automatically turns off. A 00H in this area disables the auto power off function. The initial (default) value is 0AH (10 minutes).

- ATSOTIME: Overseas version = 0F027H

Japanese-language version = 0ED27H

The 2-byte area which contains the interval in seconds between the time the last key is

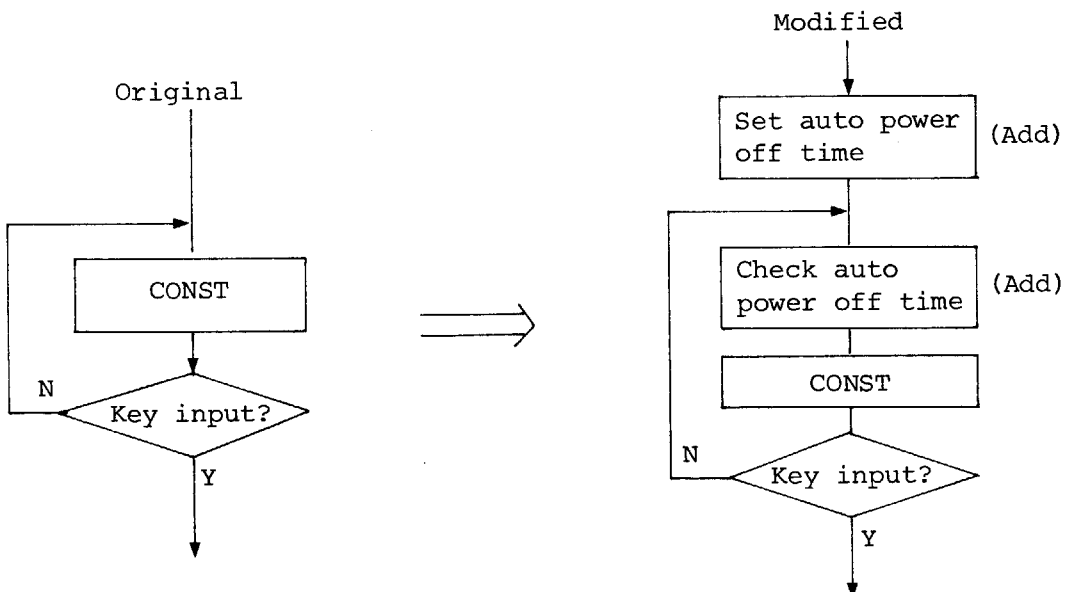
pressed and the time the power automatically turns off. It has the following relationship with ATSHUTOFF:

$$\text{ATSOTIME} = \text{ATSHUTOFF} \times 60$$

The initial (default) value is 258H (600 seconds).

When the auto power off interval is to be altered, both fields must always be changed simultaneously.

The auto power off function may not be available for application programs which do not use CONIN for receiving console input but perform console input in their own way polling the keyboard port with CONST. To make the auto power off function available for such programs, add the routines described below to the application program and have it execute the auto power off function by itself.



1) Routine for setting the auto power off time

```
LD HL, (ATSOTIME) ; Get auto power off
                    interval (in seconds)
LD DE, (TIMERØ) ; Get current 1-second
                 clock time
ADD HL, DE
LD (TIMEEND), HL ; Set 1-clock timer value
                 at which auto power off
                 is to occur
```

2) Routine for checking the auto power off time

```
LD A, (ATSHUTOFF) ; Check whether auto power
                   off time is defined
OR A
JR Z, AAAA ; Do nothing if not defined
LD HL, (TIMEEND) ; Get 1-clock timer value
                 for auto power off
LD DE, (TIMERØ) ; Current 1-clock timer
                 value
SBC HL, DE ; Match?
LD C, Ø ; Load continue mode power
        off parameter
CALL Z, POWEROFF ; If match, call POWEROFF
                 BIOS function for carry-
                 ing out continue mode
                 power off
EI ; Execution resumes at EI
   instruction when power
   is turned on again.
```

AAAA:



3) Work area descriptions

Label Name	Address	Size	Description
ATSHUTOFF	Overseas version = 0F026H Japanese-language version = 0ED26H	1	Contains the auto power off time in minutes. A 00H in this area disables the auto power off function.
ATSOTIME	Overseas version = 0F027H Japanese-language version = 0ED27H	2	Contains the auto power off time in seconds. ATSOTIME has the following relationship with ATSHUTOFF: $\text{ATSOTIME} = \text{ATSHUTOFF} \times 60$
TIMER0	Overseas version = 0F071H Japanese-language version = 0ED72H	2	16-bit counter that is incremented by 1 every one second.
TIMEEND	Overseas version = 0F6DCH Japanese-language version = 0F46BH		Loaded with the time at which auto power off is to occur. Filled by the application program.