

if all registers preserved, restart DOS call
 ---DOS 2+---
 CF clear
 Return: all registers preserved
 return via RETF with CF set or (MS-DOS 1,DR DOS) RETF 2 with CF set
 DOS will abort program with errorlevel 0
 else (RETF/RETF 2 with CF clear or IRET with CF ignored)
 interrupted DOS call is restarted
 Notes: this interrupt is invoked whenever DOS detects a ^C or ^Break; it
 should never be called directly
 MS-DOS 1.25 also invokes INT 23 on a divide overflow (INT 00)
 MS-DOS remembers the stack pointer before calling INT 23, and if it is
 not the same on return, pops and discards the top word; this is what
 permits a return with RETF as well as IRET or RETF 2
 MS-DOS 2.1+ ignores the returned CF if SP is the same on return as it
 was when DOS called INT 23, so RETF 2 will not terminate the program
 Novell DOS 7 always pops a word if CF is set on return, so one should
 not return with RETF 2 and CF set or IRET with the stored flags' CF
 set
 any DOS call may safely be made within the INT 23 handler, although
 the handler must check for a recursive invocation if it does
 call DOS

SeeAlso: INT 1B,INT 21/AH=92h"PTS-DOS"

-----D-27-----

INT 27 - DOS 1+ - TERMINATE AND STAY RESIDENT

DX = number of bytes to keep resident (max FFF0h)
 CS = segment of PSP

Return: never

Notes: this is an obsolete call
 INT 22, INT 23, and INT 24 are restored from the PSP
 does not close any open files
 the minimum number of bytes which will remain resident is 110h for
 DOS 2.x and 60h for DOS 3.0+; there is no minimum for DOS 1.x, which
 implements this service in COMMAND.COM rather than the DOS kernel

SeeAlso: INT 21/AH=31h

-----D-28-----

INT 28 C - DOS 2+ - DOS IDLE INTERRUPT

SS:SP = top of MS-DOS stack for I/O functions

Return: all registers preserved

Desc: This interrupt is invoked each time one of the DOS character input
 functions loops while waiting for input. Since a DOS call is in
 progress even though DOS is actually idle during such input waits,
 hooking this function is necessary to allow a TSR to perform DOS
 calls while the foreground program is waiting for user input. The
 INT 28h handler may invoke any INT 21h function except functions
 00h through 0Ch.

Notes: under DOS 2.x, the critical error flag (the byte immediately after the
 InDOS flag) must be set in order to call DOS functions 50h/51h from

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the INT 28h handler without destroying the DOS stacks.
calls to INT 21/AH=3Fh,40h from within an INT 28 handler may not use a
handle which refers to CON
at the time of the call, the InDOS flag (see INT 21/AH=34h) is normally
set to 01h; if larger, DOS is truly busy and should not be reentered
the default handler is an IRET instruction
supported in OS/2 compatibility box
the _MS-DOS_Programmer's_Reference_ for DOS 5.0 incorrectly documents
this interrupt as superseded
the performance of NetWare Lite servers (and probably other peer-to-
peer networks) can be dramatically improved by calling INT 28
frequently from an application's idle loop

SeeAlso: INT 21/AH=34h,INT 2A/AH=84h,INT 2F/AX=1680h

-----M-330000-----

INT 33 - MS MOUSE - RESET DRIVER AND READ STATUS

AX = 0000h

Return: AX = status

0000h hardware/driver not installed

FFFFh hardware/driver installed

BX = number of buttons

0000h other than two

0002h two buttons (many drivers)

0003h Mouse Systems/Logitech three-button mouse

FFFFh two buttons

Notes: since INT 33 might be uninitialized on old machines, the caller
should first check that INT 33 is neither 0000h:0000h nor points at
an IRET instruction (BYTE CFh) before calling this API
to use mouse on a Hercules-compatible monographics card in graphics
mode, you must first set 0040h:0049h to 6 for page 0 or 5 for page 1,
and then call this function. Logitech drivers v5.01 and v6.00
reportedly do not correctly use Hercules graphics in dual-monitor
systems, while version 4.10 does.

the Logitech mouse driver contains the signature string "LOGITECH"
three bytes past the interrupt handler; many of the Logitech mouse
utilities check for this signature.

Logitech MouseWare v6.30 reportedly does not support CGA video modes
if no CGA is present when it is started and the video board is
later switched into CGA emulation

SeeAlso: AX=0011h,AX=0021h,AX=002Fh,INT 62/AX=007Ah,INT 74

-----M-330001-----

INT 33 - MS MOUSE v1.0+ - SHOW MOUSE CURSOR

AX = 0001h

SeeAlso: AX=0002h,INT 16/AX=FFFEh,INT 62/AX=007Bh,INT 6F/AH=06h"F_TRACK_ON"

-----M-330002-----

INT 33 - MS MOUSE v1.0+ - HIDE MOUSE CURSOR

AX = 0002h

Note: multiple calls to hide the cursor will require multiple calls to
function 01h to unhide it.

SeeAlso: AX=0001h,AX=0010h,INT 16/AX=FFFFh,INT 62/AX=007Bh

SeeAlso: INT 6F/AH=08h"F_TRACK_OFF"

-----M-330003-----

INT 33 - MS MOUSE v1.0+ - RETURN POSITION AND BUTTON STATUS

AX = 0003h

Return: BX = button status (see #03168)

CX = column

DX = row

Note: in text modes, all coordinates are specified as multiples of the cell size, typically 8x8 pixels

SeeAlso: AX=0004h,AX=000Bh,INT 2F/AX=D000h"ZWmous"

Bitfields for mouse button status:

Bit(s) Description (Table 03168)

0 left button pressed if 1

1 right button pressed if 1

2 middle button pressed if 1 (Mouse Systems/Logitech/Genius)

-----M-330004-----

INT 33 - MS MOUSE v1.0+ - POSITION MOUSE CURSOR

AX = 0004h

CX = column

DX = row

Note: the row and column are truncated to the next lower multiple of the cell size (typically 8x8 in text modes); however, some versions of the Microsoft documentation incorrectly state that the coordinates are rounded

SeeAlso: AX=0003h,INT 62/AX=0081h,INT 6F/AH=10h"F_PUT_SPRITE"

-----M-330005-----

INT 33 - MS MOUSE v1.0+ - RETURN BUTTON PRESS DATA

AX = 0005h

BX = button number (see #03169)

Return: AX = button states (see #03168)

BX = number of times specified button has been pressed since last call

CX = column at time specified button was last pressed

DX = row at time specified button was last pressed

Note: at least for the Genius mouse driver, the number of button presses returned is limited to 7FFFh

SeeAlso: AX=0006h,INT 62/AX=007Ch

(Table 03169)

Values for mouse button number:

0000h left

0001h right

0002h middle (Mouse Systems/Logitech/Genius mouse)

-----M-330006-----

INT 33 - MS MOUSE v1.0+ - RETURN BUTTON RELEASE DATA

AX = 0006h

BX = button number (see #03169)

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Return: AX = button states (see #03168)

BX = number of times specified button has been released since last call

CX = column at time specified button was last released

DX = row at time specified button was last released

Note: at least for the Genius mouse driver, the number of button releases returned is limited to 7FFFh

SeeAlso: AX=0005h,INT 62/AX=007Ch

-----M-330007-----

INT 33 - MS MOUSE v1.0+ - DEFINE HORIZONTAL CURSOR RANGE

AX = 0007h

CX = minimum column

DX = maximum column

Note: in text modes, the minimum and maximum columns are truncated to the next lower multiple of the cell size, typically 8x8 pixels

SeeAlso: AX=0008h,AX=0010h,AX=0031h,INT 62/AX=0080h

SeeAlso: INT 6F/AH=0Ch"F_SET_LIMITS_X"

-----M-330008-----

INT 33 - MS MOUSE v1.0+ - DEFINE VERTICAL CURSOR RANGE

AX = 0008h

CX = minimum row

DX = maximum row

Note: in text modes, the minimum and maximum rows are truncated to the next lower multiple of the cell size, typically 8x8 pixels

SeeAlso: AX=0007h,AX=0010h,AX=0031h,INT 62/AX=0080h

SeeAlso: INT 6F/AH=0Eh"F_SET_LIMITS_Y"

-----M-330009-----

INT 33 - MS MOUSE v3.0+ - DEFINE GRAPHICS CURSOR

AX = 0009h

BX = column of cursor hot spot in bitmap (-16 to 16)

CX = row of cursor hot spot (-16 to 16)

ES:DX -> mask bitmap (see #03170)

Notes: in graphics modes, the screen contents around the current mouse cursor position are ANDed with the screen mask and then XORed with the cursor mask

the Microsoft mouse driver v7.04 and v8.20 uses only BL and CL, so the hot spot row/column should be limited to -128..127

Microsoft KnowledgeBase article Q19850 states that the high bit is right-most, but that statement is contradicted by all other available documentation

SeeAlso: AX=000Ah,AX=0012h,AX=002Ah,INT 62/AX=007Fh,INT 6F/AH=0Ah"F_DEF_MASKS"

Format of mouse mask bitmap:

Offset Size Description (Table 03170)

00h 16 WORDsscreen mask

10h 16 WORDscursor mask

Note: each word defines the sixteen pixels of a row, low bit rightmost

-----M-33000A-----

INT 33 - MS MOUSE v3.0+ - DEFINE TEXT CURSOR

AX = 000Ah
 BX = hardware/software text cursor
 0000h software
 CX = screen mask
 DX = cursor mask
 0001h hardware
 CX = start scan line
 DX = end scan line

Note: when the software cursor is selected, the character/attribute data at the current screen position is ANDed with the screen mask and then XORed with the cursor mask

SeeAlso: AX=0009h,INT 62/AX=007Eh

-----M-3300B-----

INT 33 - MS MOUSE v1.0+ - READ MOTION COUNTERS

AX = 000Bh

Return: CX = number of mickeys mouse moved horizontally since last call
 DX = number of mickeys mouse moved vertically

Notes: a mickey is the smallest increment the mouse can sense
 positive values indicate down/right

SeeAlso: AX=0003h,AX=001Bh,AX=0027h

-----M-3300C-----

INT 33 - MS MOUSE v1.0+ - DEFINE INTERRUPT SUBROUTINE PARAMETERS

AX = 000Ch

CX = call mask (see #03171)

ES:DX -> FAR routine (see #03172)

SeeAlso: AX=0018h

Bitfields for mouse call mask:

Bit(s) Description (Table 03171)

0	call if mouse moves
1	call if left button pressed
2	call if left button released
3	call if right button pressed
4	call if right button released
5	call if middle button pressed (Mouse Systems/Logitech/Genius mouse)
6	call if middle button released (Mouse Systems/Logitech/Genius mouse)
7-15	unused

Note: some versions of the Microsoft documentation incorrectly state that CX bit 0 means call if mouse cursor moves

(Table 03172)

Values interrupt routine is called with:

AX = condition mask (same bit assignments as call mask)

BX = button state

CX = cursor column

DX = cursor row

SI = horizontal mickey count

DI = vertical mickey count

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Notes: some versions of the Microsoft documentation erroneously swap the meanings of SI and DI
in text modes, the row and column will be reported as a multiple of the character cell size, typically 8x8 pixels

-----M-33000D-----

INT 33 - MS MOUSE v1.0+ - LIGHT PEN EMULATION ON
AX = 000Dh

SeeAlso: AX=000Eh,INT 10/AH=04h

-----M-33000E-----

INT 33 - MS MOUSE v1.0+ - LIGHT PEN EMULATION OFF
AX = 000Eh

SeeAlso: AX=000Dh

-----V-FF-----

INT FF - PC/FORTH - GRAPHICS API

BX = function number
0001h function REDRAW
0002h function !PEL
0003h function @PEL
0004h function LINE
0005h function ARC
0006h function @BLOCK
0007h function !BLOCK
0008h function FLOOD

DS:SI -> FORTH program counter

SS:BP -> FORTH parameter stack


SS:SP -> FORTH return stack

details of parameters not available

Return: AX,BX,CX,DX,ES,DI may be destroyed

Note: these functions all display an error message if the graphics routines are not resident

71.3 Port listing

This is only a portion of the port list available with RBIL. For a complete listing please refer CD .

71.3.1 Notations

The port description format is:

PPPPw RW description

where: PPPP is the four-digit hex port number or a plus sign and three hex digits to indicate an offset from a base port address

w is blank for byte-size port, 'w' for word, and 'd' for dword

R is dash (or blank) if not readable, 'r' if sometimes readable, 'R' if "always" readable, '?' if readability unknown

W is dash (or blank) if not writable, 'w' if sometimes writable,

'W' if "always" writable, 'C' if write-clear, and
'?' if writability unknown

71.3.2 Listing

-----P0000001F-----

PORT 0000-001F - DMA 1 - FIRST DIRECT MEMORY ACCESS CONTROLLER (8237)

SeeAlso: PORT 0080h-008Fh"DMA",PORT 00C0h-00DFh

0000	R-	DMA channel 0	current address	byte 0, then byte 1
0000	-W	DMA channel 0	base address	byte 0, then byte 1
0001	RW	DMA channel 0	word count	byte 0, then byte 1
0002	R-	DMA channel 1	current address	byte 0, then byte 1
0002	-W	DMA channel 1	base address	byte 0, then byte 1
0003	RW	DMA channel 1	word count	byte 0, then byte 1
0004	R-	DMA channel 2	current address	byte 0, then byte 1
0004	-W	DMA channel 2	base address	byte 0, then byte 1
0005	RW	DMA channel 2	word count	byte 0, then byte 1
0006	R-	DMA channel 3	current address	byte 0, then byte 1
0006	-W	DMA channel 3	base address	byte 0, then byte 1
0007	RW	DMA channel 3	word count	byte 0, then byte 1

0008	R-	DMA channel 0-3 status register (see #P0001)		
0008	-W	DMA channel 0-3 command register (see #P0002)		
0009	-W	DMA channel 0-3 write request register (see #P0003)		
000A	RW	DMA channel 0-3 mask register (see #P0004)		
000B	-W	DMA channel 0-3 mode register (see #P0005)		

000C	-W	DMA channel 0-3 clear byte pointer flip-flop register any write clears LSB/MSB flip-flop of address and counter registers		
000D	R-	DMA channel 0-3 temporary register		
000D	-W	DMA channel 0-3 master clear register any write causes reset of 8237		
000E	-W	DMA channel 0-3 clear mask register any write clears masks for all channels		
000F	rW	DMA channel 0-3 write mask register (see #P0006)		

Notes: the temporary register is used as holding register in memory-to-memory DMA transfers; it holds the last transferred byte
channel 2 is used by the floppy disk controller
on the IBM PC/XT channel 0 was used for the memory refresh and
channel 3 was used by the hard disk controller
on AT and later machines with two DMA controllers, channel 4 is used
as a cascade for channels 0-3
command and request registers do not exist on a PS/2 DMA controller

Bitfields for DMA channel 0-3 status register:

Bit(s)	Description	(Table P0001)
7	channel 3 request active	
6	channel 2 request active	

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- 5 channel 1 request active
- 4 channel 0 request active
- 3 channel terminal count on channel 3
- 2 channel terminal count on channel 2
- 1 channel terminal count on channel 1
- 0 channel terminal count on channel 0

SeeAlso: #P0002,#P0481

Bitfields for DMA channel 0-3 command register:

- | Bit(s) | Description | (Table P0002) |
|--------|---|---------------|
| 7 | DACK sense active high | |
| 6 | DREQ sense active high | |
| 5 | =1 extended write selection | |
| | =0 late write selection | |
| 4 | rotating priority instead of fixed priority | |
| 3 | compressed timing (two clocks instead of four per transfer) | |
| | =1 normal timing (default) | |
| | =0 compressed timing | |
| 2 | =1 enable controller | |
| | =0 enable memory-to-memory | |
| 1-0 | channel number | |

SeeAlso: #P0001,#P0004,#P0005,#P0482

Bitfields for DMA channel 0-3 request register:

- | Bit(s) | Description | (Table P0003) |
|--------|----------------------|---------------|
| 7-3 | reserved (0) | |
| 2 | =0 clear request bit | |
| | =1 set request bit | |
| 1-0 | channel number | |
| | 00 channel 0 select | |
| | 01 channel 1 select | |
| | 10 channel 2 select | |
| | 11 channel 3 select | |

SeeAlso: #P0004

Bitfields for DMA channel 0-3 mask register:

- | Bit(s) | Description | (Table P0004) |
|--------|---------------------|---------------|
| 7-3 | reserved (0) | |
| 2 | =0 clear mask bit | |
| | =1 set mask bit | |
| 1-0 | channel number | |
| | 00 channel 0 select | |
| | 01 channel 1 select | |
| | 10 channel 2 select | |
| | 11 channel 3 select | |

SeeAlso: #P0001,#P0002,#P0003,#P0484

Bitfields for DMA channel 0-3 mode register:

Bit(s)	Description	(Table P0005)
7-6	transfer mode	
	00 demand mode	
	01 single mode	
	10 block mode	
	11 cascade mode	
5	direction	
	=0 increment address after each transfer	
	=1 decrement address	
3-2	operation	
	00 verify operation	
	01 write to memory	
	10 read from memory	
	11 reserved	
1-0	channel number	
	00 channel 0 select	
	01 channel 1 select	
	10 channel 2 select	
	11 channel 3 select	

SeeAlso: #P0002,#P0485

Bitfields for DMA channel 0-3 write mask register:

Bit(s)	Description	(Table P0006)
7-4	reserved	
3	channel 3 mask bit	
2	channel 2 mask bit	
1	channel 1 mask bit	
0	channel 0 mask bit	

Note: each mask bit is automatically set when the corresponding channel reaches terminal count or an external EOP signal is received

SeeAlso: #P0004,#P0486

-----P0040005F-----

PORT 0040-005F - PIT - PROGRAMMABLE INTERVAL TIMER (8253, 8254)

Notes: XT & AT use ports 40h-43h; PS/2 uses ports 40h, 42h-44h, and 47h
the counter chip is driven with a 1.193 MHz clock (1/4 of the original PC's 4.77 MHz CPU clock)

SeeAlso: PORT 0044h,PORT 0048h

- 0040 RW PIT counter 0, counter divisor (XT, AT, PS/2)
Used to keep the system time; the default divisor of (1)0000h produces the 18.2Hz clock tick.
- 0041 RW PIT counter 1, RAM refresh counter (XT, AT)
don't set below 3 on PCs (default 12h), and don't mess with this counter at all unless you really know what you're doing....
- 0042 RW PIT counter 2, cassette & speaker (XT, AT, PS/2)
During normal operation mode (8253) 40h-42h set the counter values on write and get the current counter value on read. In 16bit modes two consecutive writes/reads must be issued, first with the low byte,

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followed by the high byte. In 8254 read back modes, all selected counters and status are latched and must be read out completely before normal operation is valid again. Each counter switches back to normal operation after read out. In 'get status and counter' mode the first byte read is the status, followed by one or two counter values. (see #P0379) Note that 16-bit reads performed without using the "latch" command will get the current high/low portion of the counter at the instant of the port read, so it is possible for the low part of the counter to wrap around before the high part gets read, resulting in a significant measurement error

0043 RW PIT mode port, control word register for counters 0-2 (see #P0380)
Once a control word has been written (43h), it must be followed immediately by performing the corresponding action to the counter registers (40h-42h), else the system may hang!!

Bitfields for 8254 PIT counter status byte:

Bit(s)	Description	(Table P0379)
7	PIN status of OUTx Pins (1=high, 0=low)	
6	counter start value loaded	
	=0: yes, so counter latch is valid to be read	
	=1: no, wait for counter latch to be set (may last a while)	
5-0	counter mode, same as bit5-0 at 43h	

SeeAlso: #P0380

Bitfields for 8253/8254 PIT mode control word:

Bit(s)	Description	(Table P0380)
7-6	counter select	
	00 counter 0 select	
	01 counter 1 select	(not PS/2)
	10 counter 2 select	
	11 (8253) reserved	
	(8254) read back counter (see #P0379)	

---if counter select---

5-4	counter access	
	00 counter latch command	
	BUG: Intel Neptune/Mercury/Aries Chipset 82371B (SIO) needs a short delay after issuing this command, else the latched MSB may be outdated with respect to the LSB, resulting in large measuring errors.	
	Workaround: Check for this condition by comparing results with last results and don't use erroneous results.	
	01 read/write counter bits 0-7 only	
	10 read/write counter bits 8-15 only	
	11 read/write counter bits 0-7 first, then 8-15	
3-1	counter mode	
	000 mode 0 select - zero detection interrupt	
	001 mode 1 select - programmable one shot	

- x10 mode 2 select - rate generator
- x11 mode 3 select - square wave generator
 - counts down twice by two at a time; latch status and check value of OUT pin to determine which half-cycle is active
 - divisor factor 3 not allowed!
- 100 mode 4 select - software triggered strobe
- 101 mode 5 select - hardware triggered strobe
- 0 counting style
 - 0 binary counter 16 bits
 - 1 BCD counter (4 decades)
- if read back---
- 5-4 what to read
 - 00 counter status, then value
 - 01 counter value
 - 10 counter status
 - 11 reserved
- 3 select counter 2
- 2 select counter 1
- 1 select counter 0
- 0 reserved (0)

Note: after issuing a read back 'get status' command, any new read back command is ignored until the status is read from all selected counters.

-----K-P0060006F-----

PORT 0060-006F - KEYBOARD CONTROLLER 804x (8041, 8042) (or PPI (8255) on PC,XT)

Note: XT uses ports 60h-63h, AT uses ports 60h-64h

- 0060 RW KB controller data port or keyboard input buffer (ISA, EISA)
 - should only be read from after status port bit0 = 1
 - should only be written to if status port bit1 = 0
- 0060 R- KeyBoard or KB controller data output buffer (via PPI on XT)
 - PC: input from port A of 8255, if bit7 in 61h set (see #P0396)
 - get scancodes, special codes (in PC: with bit7 in 61h cleared)
 - (see #P0390)
- 0061 R- KB controller port B control register (ISA, EISA)
 - system control port for compatibility with 8255 (see #P0393)
- 0061 -W KB controller port B (ISA, EISA) (PS/2 port A is at 0092)
 - system control port for compatibility with 8255 (see #P0392)
- 0061 -W PPI Programmable Peripheral Interface 8255 (XT only)
 - system control port (see #P0394)
- 0062 RW PPI (XT only) data port C (see #P0395)
- 0063 RW PPI (XT only) command mode register (see #P0397)
- 0064 R- keyboard controller read status (see #P0398,#P0399,#P0400)
- 0064 -W keyboard controller input buffer (ISA, EISA) (see #P0401)
- 0064 -W (Amstrad/Schneider PC1512) set 'DIP switch S1' setting

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stored in CMOS RAM that PPI should report for compatibility
0065 -W (Amstrad/Schneider PC1512) set 'DIP switch S2' RAM size setting
stored in CMOS RAM, that PPI port C (PORT 0064h) should report for
compatibility

0065 R- communications port (Olivetti M24)

0066 R? configuration port (Olivetti M24 with model byte 0)
bit 5 set if 8530 SIO present (see also PORT 0065h"Olivetti")

Bitfields for AT keyboard controller input port:

Bit(s)	Description	(Table P0381)
7	keyboard enabled	
6	=0 CGA, else MDA	
5	=0 manufacturing jumper installed	
4	=0 system RAM 512K, else 640K	
3-0	reserved	

SeeAlso: #P0382,#P0384

Bitfields for AT keyboard controller input port (Compaq):

Bit(s)	Description	(Table P0382)
7	security lock is unlocked	
6	=0 Compaq dual-scan display, 1=non-Compaq display	
5	system board dip switch 5 is OFF	
4	=0 auto speed selected, 1=high speed selected	
3	=0 slow (4MHz), 1 = fast (8MHz)	
2	no math coprocessor installed	
1-0	reserved	

SeeAlso: #P0383

Bitfields for AT keyboard controller output port:

Bit(s)	Description	(Table P0383)
7	keyboard data output	
6	keyboard clock output	
5	input buffer NOT full	
4	output buffer NOT empty	
3	reserved (see note)	
2	reserved (see note)	
1	gate A20	
0	system reset	

Note: bits 2 and 3 are the turbo speed switch or password lock on
Award/AMI/Phoenix BIOSes. These bits make use of nonstandard
keyboard controller BIOS functionality to manipulate
pin 23 (8041 port 22) as turbo switch for AWARD
pin 35 (8041 port 15) as turbo switch/pw lock for Phoenix

SeeAlso: #P0381,#P0384

-----P0070007F-----

PORT 0070-007F - CMOS RAM/RTC (REAL TIME CLOCK)

Note: the real-time clock may be either a discrete MC146814, MC146818, or

an emulation thereof built into the motherboard chipset
SeeAlso: PORT 00A0h"XT"

0070 -W CMOS RAM index register port (ISA, EISA)
 bit 7 = 1 NMI disabled from reaching CPU
 = 0 NMI enabled
 bit 6-0 CMOS RAM index
 (64 bytes in early systems, now usually 128 bytes)
 Note: any write to PORT 0070h should be followed by an action to
 PORT 0071h or the RTC will be left in an unknown state.

0071 RW CMOS RAM data port (ISA, EISA) (see #P0409)

(Table P0409)

Values for Real-Time Clock register number (see also CMOS.LST):

00h-0Dh clock registers
 0Eh diagnostics status byte
 0Fh shutdown status byte
 10h diskette drive type for A: and B:
 11h reserved / IBM fixed disk / setup options
 12h fixed disk drive type for drive 0 and drive 1
 13h reserved / AMI Extended CMOS setup (AMI Hi-Flex BIOS)
 14h equipment byte
 15h LSB of system base memory in Kb
 16h MSB of system base memory in Kb
 17h LSB of total extended memory in Kb
 18h MSB of total extended memory in Kb
 19h drive C extension byte
 1Ah drive D extension byte
 1Bh-2Dh reserved
 20h-27h commonly used for first user-configurable drive type
 2Eh CMOS MSB checksum over 10-2D
 2Fh CMOS LSB checksum over 10-2D
 30h LSB of extended memory found above 1Mb at POST
 31h MSB of extended memory found above 1Mb at POST
 32h date century in BCD
 33h information flags
 34h-3Fh reserved
 35h-3Ch commonly used for second user-configurable drive type
 3Dh-3Eh word to 82335 MCR memory config register at [22] (Phoenix)
 42h-4Ch AMI 1990 Hyundai super-NB368S notebook
 ???
 54h-57h AMI 1990 Hyundai super-NB368S notebook
 ???
 5Ch-5Dh AMI 1990 Hyundai super-NB368S notebook
 ???
 60h-61h AMI 1990 Hyundai super-NB368S notebook
 ???

-----V-P03C603C9-----

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PORT 03C6-03C9 - EGA/VGA/MCGA - DAC REGISTERS

Range: PORT 03C6h or PORT 02C6h (alternate)

SeeAlso: PORT 03C0h,PORT 03C2h,PORT 03C4h,PORT 03CAh,PORT 03CEh"EGA",PORT 03D0h

SeeAlso: PORT 83C6h"Wingine"

03C6 RW (VGA, MCGA) PEL mask register (default FFh)

VGA: AND mask for color-register address.

MCGA: Never change from the default FFh.

03C6 RW HiColor ET4000 (Sierra RAMDACs e.g. SC11486, SC11481, SC11488):

Enable HiColor feature: beside other assignments, consecutive read 3C6h 4 times and write magic value 80h to it.

03C7 -W (VGA,MCGA,CEG-VGA) PEL address register (read mode)

Sets DAC in read mode and assign start of color register index (0..255) for following read accesses to 3C9h.

Don't write to 3C9h while in read mode. Next access to 03C8h will stop pending mode immediatly.

03C7 -W (CEG-Color VGA w/ Edsun Labs RAMDACs)

Enable and set Countinous Edge Graphics Mode:

Consecutive writely the following three key sequences in read mode (!) to 3C9h register DEh : 'CEG', 'EDS', 'UNx' (x see below). Current CEG mode can be read from palette register BFh 'blue', write access to that register will disable CEG features.

In CEG modes by combining old with new colors and dynamically changing palette values, the effective colors displayable are enhanced dramatically (in EDP modes up to virtually 32bit truecolor) on standard 16/256 color VGA. Also, effective resolution enhancement takes effect by anti-aliasing.

Necessary EDP escape sequences should be moved to image border or single colored areas, if possible.

REP-mode: if pixel are doubled in current video mode

EDP-mode: pseudo-truecolor with Edsun dynamic palette

(see #P0698,#P0699)

Palette-color-register single-byte-format (each 3 times):

Mode A:

bit7-4: mix code

bit3-0: color code

Mode B:

bit7-5: mix code

bit4 : 0=new, 1=old

bit3-0: color code

Mode C:

bit3 : 0=color, 1=code

bit2-0: color / mix code

Mode D:

bit7-0: see mix code table

Non-CEG modes:

bit7-0: as usual

In EDP modes, video-memory-palette-changing escape-sequences:

Mode A: Mode B: Mode C: Mode D:

7/escape 7/escape 7/escape 0BFh

red red red7-4 red

```

green    green    red3-0   green
blue     blue     green7-4 blue
address  address  green3-0 address
                    blue7-4
                    blue3-0
                    address
    
```

- 03C7 R- VGA DAC state register
 - bit7-2 reserved
 - bit1-0: 00b write palette cycle (write mode)
 - 01h reserved
 - 10b reserved
 - 11b read palette cycle (read mode)
- 03C8 RW (VGA,MCGA) PEL address register (write mode)
 - Sets DAC in write mode and assign start of color register index (0..255) for following write accesses to 3C9h.
 - Don't read from 3C9h while in write mode. Next access to 03C8h will stop pending mode immediatly.
- 03C8 RW (Genoa SuperEGA) SuperEGA control register (all emulation modes)
 - bit7-2: reserved
 - bit1 : 0=EGA mode, 1=backward compatibility mode
 - bit0 : not used
- 03C8 R? (S3 Trio32/64) General Input Port (see #P0738)
- 03C9 RW (VGA,MCGA) PEL data register
 - Three consecutive reads (in read mode) or writes (in write mode) in the order: red, green, blue. The internal DAC index is incremented each 3rd access.
 - bit7-6: HiColor VGA DACs only: color-value bit7-6
 - bit5-0: color-value bit5-0

(Table P0698)

Values for EDSUN CEG (Continuous Edge Graphics) modes::

x: mode:	colors:	mix:	pixel depth:	effective colors:
0 = disabled	256	-	8	256
1 = A	16	16	8	1920
2 = A+REP	16	16	8 dblscn	1920
3 = A+EDP	15	16		truecolor
4 = reserved	-	-	-	-
5 = B	16	8	8	960
6 = B+REP	16	8	8 dblscn	960
7 = B+EDP	15	8		truecolor
8 = reserved	-	-	-	-
9 = C	8	8	4	224
10 = C+REP	8	8	4 dblscn	224
11 = C+EDP	7	8		truecolor
12 = reserved	-	-	-	-
13 = D	223	32	8	792096
14 = D+REP	223	32	8 dblscn	792096
15 = D+EDP	223	32		truecolor

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SeeAlso: #P0699

(Table P0699)

Values for EDSUN CEG mixing codes:

Mode A:		Mode C:		
mix:	new: old:	mix:	new: old:	colorcode:
0	= 32/32 0/32	0	= - -	0
1	= 30/32 2/32	1	= - -	1
2	= 28/32 4/32	2	= - -	2
3	= 26/32 6/32	3	= - -	3
4	= 24/32 8/32	4	= - -	4
5	= 22/32 10/32	5	= - -	5
6	= 20/32 12/32	6	= - -	6
7	= 18/32 14/32	7	= - -	7/EDP
8	= 16/32 16/32	8	= 30/32 2/32	-
9	= 14/32 18/32	9	= 28/32 4/32	-
10	= 12/32 20/32	10	= 26/32 6/32	-
11	= 10/32 22/32	11	= 24/32 8/32	-
12	= 8/32 24/32	12	= 22/32 10/32	-
13	= 6/32 26/32	13	= 20/32 12/32	-
14	= 4/32 28/32	14	= 18/32 14/32	-
15	= 2/32 30/32	15	= 16/32 16/32	-

---Mode B:		Mode D:		
mix:	new: old:	mix:	new: old:	description:
0	= 30/32 2/32	00h..BEh	= - -	normal color
1	= 26/32 6/32	BFh	= - -	EDP
2	= 22/32 10/32	C0h	= 32/32 0/32	
3	= 18/32 14/32	C1h	= 31/32 1/32	
4	= 14/32 18/32	C2h	= 30/32 2/32	
5	= 10/32 22/32	...	=	
6	= 6/32 26/32	DFh	= 0/32 32/32	
7	= 2/32 30/32	E0h-FFh	= - -	normal color

SeeAlso: #P0698

71.4 Memory map

DOS, BIOS and other software use certain specific memory address spaces to store important information. So if we know those addresses, we can manipulate the values present there with *pointers*. For example, the keyboard buffer's head pointer is found at 0040:001A; we need this address if we want to manipulate the keyboard buffer.

Memory map is one of the wonderful collections present in RBIL. You may want to "play" with pointers. So here I present the full memory map from RBIL.

```
-----H-M00000000-----  
MEM 0000h:0000h R - INTERRUPT VECTOR TABLE  
Size: 1024 BYTES  
Note: see also the main interrupt list
```


-----b-M0000031D-----

MEM 0000h:031Dh - 1989 AMI 386sx BIOS - USER-DEFINABLE TYPE 47 HARD DISK PARMS

Size: 16 BYTES

Note: these fields are used if the AMI BIOS setup is set to use the top of the interrupt table for the extended BIOS data area

SeeAlso: MEM 0000h:032Dh,INT 41

-----b-M0000032D-----

MEM 0000h:032Dh - 1989 AMI 386sx BIOS - USER-DEFINABLE TYPE 48 HARD DISK PARMS

Size: 16 BYTES

Note: these fields are used if the AMI BIOS setup is set to use the top of the interrupt table for the extended BIOS data area

SeeAlso: MEM 0000h:031Dh,INT 46

-----B-M00000400-----

MEM 0000h:0400h - BIOS DATA AREA

Size: 256 BYTES

Note: see also the MEM 0040h:xxxxh entries

-----M00000500-----

MEM 0000h:0500h - DATA AREA

Size: 256 BYTES

-----D-M00000600-----

MEM 0000h:0600h - MS-DOS 1.x LOAD ADDRESS

-----D-M00000700-----

MEM 0000h:0700h - MS-DOS 2+ LOAD ADDRESS

-----S-M00400000-----

MEM 0040h:0000h - BASE I/O ADDRESS OF FIRST SERIAL I/O PORT

Size: WORD

Notes: the BIOS sets this word to zero if is unable to find any serial ports at the addresses it is programmed to check at boot

DOS and BIOS serial device numbers may be redefined by re-assigning these values of the base I/O addresses stored here

Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM1=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0002h, MEM 0040h:0004h, MEM 0040h:0006h, MEM 0040h:0008h

SeeAlso: MEM 0040h:007Ch, INT 14/AH=00h, PORT 03F8h "SERIAL"

-----S-M00400002-----

MEM 0040h:0002h - BASE I/O ADDRESS OF SECOND SERIAL I/O PORT

Size: WORD

Notes: the BIOS sets this word to zero if is unable to find more than one serial port at the addresses it is programmed to check at boot

DOS and BIOS serial device numbers may be redefined by re-assigning these values of the base I/O addresses stored here

Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM2=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0000h, MEM 0040h:0004h, MEM 0040h:0006h, MEM 0040h:000Ah

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SeeAlso: MEM 0040h:007Dh,INT 14/AH=00h,PORT 02F8h"SERIAL"

-----S-M00400004-----

MEM 0040h:0004h - BASE I/O ADDRESS OF THIRD SERIAL I/O PORT

Size: WORD

Notes: the BIOS sets this word to zero if is unable to find more than two serial ports at the addresses it is programmed to check at boot
Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM3=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0000h,MEM 0040h:0002h,MEM 0040h:0006h,MEM 0040h:000Ch

SeeAlso: MEM 0040h:007Eh,PORT 03E8h"SERIAL"

-----S-M00400006-----

MEM 0040h:0006h - BASE I/O ADDRESS OF FOURTH SERIAL I/O PORT

Size: WORD

Notes: the BIOS sets this word to zero if is unable to find more than three serial ports at the addresses it is programmed to check at boot
Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM4=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0000h,MEM 0040h:0002h,MEM 0040h:0004h,MEM 0040h:0008h

SeeAlso: MEM 0040h:007Fh,PORT 02E8h"SERIAL"

-----P-M00400008-----

MEM 0040h:0008h - BASE I/O ADDRESS OF FIRST PARALLEL I/O PORT

Size: WORD

Notes: the BIOS POST routine fills in the parallel port address fields in turn as it finds parallel ports. All fields beyond the last one for which a valid parallel port was found are set to zero.
the BIOS INT 17 handler uses these fields to address the parallel ports
Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT1=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0000h,MEM 0040h:000Ah,MEM 0040h:000Ch,INT 17/AH=00h

SeeAlso: PORT 0278h"PRINTER",PORT 03BCh"PRINTER"

-----P-M0040000A-----

MEM 0040h:000Ah - BASE I/O ADDRESS OF SECOND PARALLEL I/O PORT

Size: WORD

Notes: zero if fewer than two parallel ports installed
Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT2=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0002h,MEM 0040h:0008h,MEM 0040h:000Ch,PORT 0278h"PRINTER"

SeeAlso: PORT 0378h"PRINTER",INT 17/AH=00h

-----P-M0040000C-----

MEM 0040h:000Ch - BASE I/O ADDRESS OF THIRD PARALLEL I/O PORT

Size: WORD

Notes: zero if fewer than three parallel ports installed

Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT3=[port_address|logical_no][, [timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0004h, MEM 0040h:0008h, MEM 0040h:000Ah, MEM 0040h:000Eh

SeeAlso: PORT 0378h"PRINTER", INT 17/AH=00h

-----P-M0040000E-----

MEM 0040h:000Eh - BASE I/O ADDRESS OF FOURTH PARALLEL I/O PORT (pre-PS/2)

Size: WORD

Notes: zero if fewer than four parallel ports installed

Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT4=(port_address|logical_no)[, [timeout]] directive, where port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20). To avoid any interference with the PS/2 and later interpretation, this will be rejected if this entry does not hold 0, which would indicate it is used for different purposes.

SeeAlso: MEM 0040h:0008h, MEM 0040h:000Ah, MEM 0040h:000Eh"BIOS DATA"

SeeAlso: PORT 0378h"PRINTER", INT 17/AH=00h

-----B-M0040000E-----

MEM 0040h:000Eh - SEGMENT OF EXTENDED BIOS DATA SEGMENT (PS/2, newer BIOSes)

Size: WORD

SeeAlso: MEM 0040h:000Eh"PARALLEL", INT 15/AH=C1h

Format of Extended BIOS Data Area (IBM):

Offset Size Description (Table M0001)

00h BYTE length of EBDA in kilobytes

01h 15 BYTES reserved

17h BYTE number of entries in POST error log (0-5)

18h 5 WORDs POST error log (each word is a POST error number)

22h DWORD Pointing Device Driver entry point

26h BYTE Pointing Device Flags 1 (see #M0002)

27h BYTE Pointing Device Flags 2 (see #M0003)

28h 8 BYTES Pointing Device Auxiliary Device Data

30h DWORD Vector for INT 07h stored here during 80387 interrupt

34h DWORD Vector for INT 01h stored here during INT 07h emulation

38h BYTE Scratchpad for 80287/80387 interrupt code

39h WORD Timer3: Watchdog timer initial count

3Bh BYTE ??? seen non-zero on Model 30

3Ch BYTE ???

3Dh 16 BYTES Fixed Disk parameter table for drive 0 (for older machines which don't directly support the installed drive)

4Dh 16 BYTES Fixed Disk parameter table for drive 1 (for older machines which don't directly support the installed drive)

5Dh-67h ???

68h BYTE cache control

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		bits 7-2 unused (0)
		bit 1: CPU cache failed test
		bit 0: CPU cache disabled
69h-6Bh		???
6Ch	BYTE	Fixed disk: (=FFh on ESDI systems) bits 7-4: Channel number 00-0Fh bits 3-0: DMA arbitration level 00-0Eh
6Dh	BYTE	???
6Eh	WORD	current typematic setting (see INT 16/AH=03h)
70h	BYTE	number of attached hard drives
71h	BYTE	hard disk 16-bit DMA channel
72h	BYTE	interrupt status for hard disk controller (1Fh on timeout)
73h	BYTE	hard disk operation flags bit 7: controller issued operation-complete INT 76h bit 6: controller has been reset bits 5-0: unused (0)
74h	DWORD	old INT 76h vector
78h	BYTE	hard disk DMA type typically 44h for reads and 4Ch for writes
79h	BYTE	status of last hard disk operation
7Ah	BYTE	hard disk timeout counter
7Bh-7Dh		
7Eh	8 WORDs	storage for hard disk controller status
8Eh-E6h		
E7h	BYTE	floppy drive type bit 7: drive(s) present bits 6-2: unused (0) bit 1: drive 1 is 5.25" instead of 3.5" bit 0: drive 0 is 5.25"
E8h	4 BYTES	???
ECh	BYTE	hard disk parameters flag bit 7: parameters loaded into EBDA bits 6-0: unused (0)
EDh	BYTE	???
EEh	BYTE	CPU family ID (03h = 386, 04h = 486, etc.) (see INT 15/AH=C9h)
EFh	BYTE	CPU stepping (see INT 15/AH=C9h)
FOh	39 BYTES	???
117h	WORD	keyboard ID (see INT 16/AH=0Ah) (most commonly 41ABh)
119h	BYTE	???
11Ah	BYTE	non-BIOS INT 18h flag bits 7-1: unused (0) bit 0: set by BIOS before calling user INT 18h at offset 11Dh
11Bh	2 BYTE	???
11Dh	DWORD	user INT 18h vector if BIOS has re-hooked INT 18h
121h and up:		??? seen non-zero on Model 60
3F0h	BYTE	Fixed disk buffer (???)

SeeAlso: #M0004

Bitfields for Pointing Device Flags 1:

Bit(s)	Description	(Table M0002)
7	command in progress	
6	resend byte (FAh) received	
5	acknowledge byte (FEh) received	
4	error byte (FCh) received	
3	unexpected value received	
2-0	index count for auxiliary device data at 28h	

SeeAlso: #M0001,#M0003

Bitfields for Pointing Device Flags 2:

Bit(s)	Description	(Table M0003)
7	device driver far call flag	
6-3	reserved	
2-0	package size (number of bytes received) - 1	

SeeAlso: #M0001,#M0002

Format of Extended BIOS Data Area (AMI v1.00.12.AX1T):

Offset	Size	Description	(Table M0004)
00h	BYTE	length of XBDA in kilobytes	
01h	15 BYTES	reserved	
17h	BYTE	number of entries in POST error log (0-10)	
18h	10 BYTES	unused???	
22h	DWORD	Pointing Device Driver entry point	
26h	BYTE	Pointing Device Flags 1 (see #M0002)	
27h	BYTE	Pointing Device Flags 2 (see #M0003)	
28h	8 BYTES	Pointing Device Auxiliary Device Data	
30h	13 BYTES	???	
3Dh	16 BYTES	Fixed Disk parameter table for drive 0	
4Dh	16 BYTES	Fixed Disk parameter table for drive 1	
5Dh	16 BYTES	parameter table for drive 2???	
6Dh	16 BYTES	parameter table for drive 3???	
80h	56 BYTES?	IDE drive 0 manufacturer/model string	
B8h	41 BYTES	AMIBIOS copyright string	
E1h		unused???	
102h	WORD	???	flags bit 15: ???
108h	WORD	offset of IntelIDECfgTbl (IDE configuration settings) within segment F000h	
10Ah	2 BYTES	???	
10Ch	DWORD	pointer to routine to call for language-specific error messages	
110h	WORD	offset in segment F000h of end of currently-loaded optional BIOS subsystems (language, APM, etc.)	
112h	WORD	offset in segment F000h of end of area available for loading optional BIOS subsystems	
1F0h	BYTE	APM status flags	
1F1h	8 BYTES	APM power-state data for device classes 01h-06h	

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bits 0-3: current power state for devices 00h-03h in class
bits 7-4: current engaged state for devices 00h-03h in class
1F9h 4 BYTES APM power-state data for device classes 01h-08h (four devices
per class)
1FDh 3 BYTES ???
200h 10 WORDs POST error log
214h ???
SeeAlso: #M0001,#M0005

Format of Extended BIOS Data Area (PhoenixBIOS 4.0):

Offset	Size	Description	(Table M0005)
00h	BYTE	length of XBDA in kilobytes	
01h	33 BYTES	reserved	
22h	DWORD	Pointing Device Driver entry point	
26h	BYTE	Pointing Device Flags 1 (see #M0002)	
27h	BYTE	Pointing Device Flags 2 (see #M0003)	
28h	8 BYTES	Pointing Device Auxiliary Device Data	

SeeAlso: #M0001,#M0004

-----B-M00400010-----

MEM 0040h:0010h - INSTALLED HARDWARE

Size: WORD

SeeAlso: INT 11

Bitfields for BIOS-detected installed hardware:

Bit(s)	Description	(Table M0006)
15-14	number of parallel devices	
	00 or 11 sometimes used to indicate four LPT ports	
13	(Convertible, PS/2-55LS) internal modem	
12	game port installed	
11-9	number of serial devices	
	000 or 111 sometimes used to indicate eight COM ports	
8	reserved	
7-6	number of floppy disk drives (minus 1)	
5-4	initial video mode	
	00 EGA,VGA,PGA, or other with on-board video BIOS	
	01 40x25 CGA color	
	10 80x25 CGA color	
	11 80x25 mono text	
3-2	(PC only) RAM on motherboard	
	00 = 16K, 01 = 32K, 10 = 48K, 11 = 64K	
	(some XTs) RAM on motherboard	
	00 = 64K, 01 = 128K, 10 = 192K, 11 = 256K	
2	(pre-PS/2 except PC) reserved	
	(PS/2, some XT clones, newer BIOSes) pointing device installed	
1	math coprocessor installed	
0	floppy disk drives are installed	
	booted from floppy	

-----B-M00400012-----

MEM 0040h:0012h - Convertible - POST STATUS

Size: BYTE

-----B-M00400012-----

MEM 0040h:0012h U - AT - MANUFACTURING TEST INITIALIZATION FLAGS

Size: BYTE

Bitfields for AT manufacturing test initialization flags:

Bit(s) Description (Table M0007)

0 start in manufacturing test mode rather than normal operation

1-7 unused

-----b-M00400012-----

MEM 0040h:0012h - MCA - MANUFACTURING TEST

Size: BYTE

Bitfields for MCA manufacturing test flags :

Bit(s) Description (Table M0008)

7 POST flag, ???

6-5 unused

4 POST flag, slot 4 has adapter identifier EDAFh

3 POST flag, 80x25 color video

2 POST flag, ???

1 unused

0 manufacturing test mode rather than normal operation

-----b-M00400012-----

MEM 0040h:0012h - PS/2 Model 25 - POST SYSTEM FLAG

Size: BYTE

Bitfields for PS/2 Model 25 POST sytem flag :

Bit(s) Description (Table M0009)

0 optional memory failed; memory remapped

1 real-time clock installed

-----B-M00400013-----

MEM 0040h:0013h - BASE MEMORY SIZE IN KBYTES

Size: WORD

SeeAlso: INT 12

-----b-M00400015-----

MEM 0040h:0015h - PC, XT - ADAPTER MEMORY SIZE IN KBYTES

Size: WORD

-----b-M00400015-----

MEM 0040h:0015h U - AT - MANUFACTURING TEST SCRATCH PAD

Size: BYTE

-----K-M00400015-----

MEM 0040h:0015h - Compaq Deskpro 386 - PREVIOUS SCAN CODE

Size: BYTE

-----b-M00400016-----

MEM 0040h:0016h U - AT - MANUFACTURING TEST SCRATCH PAD

Size: BYTE

-----b-M00400016-----

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MEM 0040h:0016h U - PS/2 Model 30 - BIOS CONTROL FLAGS

Size: BYTE

-----K-M00400016-----

MEM 0040h:0016h - Compaq Deskpro 386 - KEYCLICK VOLUME

Size: BYTE

Range: 00h-7Fh

-----K-M00400017-----

MEM 0040h:0017h - KEYBOARD - STATUS FLAGS 1

Size: BYTE

SeeAlso: MEM 0040h:0018h,INT 16/AH=02h,MEM 0040h:0096h

Bitfields for keyboard status flags 1:

Bit(s) Description (Table M0010)

- 7 INSert active
- 6 Caps Lock active
- 5 Num Lock active
- 4 Scroll Lock active
- 3 either Alt pressed
- 2 either Ctrl pressed
- 1 Left Shift pressed
- 0 Right Shift pressed

SeeAlso: #M0011,#00587

-----K-M00400018-----

MEM 0040h:0018h - KEYBOARD - STATUS FLAGS 2

Size: BYTE

SeeAlso: MEM 0040h:0017h,INT 16/AH=12h

Bitfields for keyboard status flags 2 :

Bit(s) Description (Table M0011)

- 7 INSert pressed
- 6 Caps Lock pressed
- 5 Num Lock pressed
- 4 Scroll Lock pressed
- 3 Pause state active
- 2 Sys Req pressed
- 1 Left Alt pressed
- 0 Left Ctrl pressed

SeeAlso: #M0010,#00588

-----K-M00400019-----

MEM 0040h:0019h - KEYBOARD - ALT-NNN KEYPAD WORKSPACE

Size: BYTE

Desc: holds the current value of an Alt-NNN keypad sequence; when Alt is released and this byte is non-zero, the appropriate character is placed in the keyboard buffer

SeeAlso: INT 16/AH=00h,MEM 0040h:001Ah

-----K-M0040001A-----

MEM 0040h:001Ah - KEYBOARD - POINTER TO NEXT CHARACTER IN KEYBOARD BUFFER

Size: WORD

SeeAlso: MEM 0040h:001Ch, MEM 0040h:0080h, MEM 0040h:0082h, INT 16/AH=00h

-----K-M0040001C-----

MEM 0040h:001Ch - KEYBOARD - POINTER TO FIRST FREE SLOT IN KEYBOARD BUFFER

Size: WORD

SeeAlso: MEM 0040h:001Ah, MEM 0040h:001Eh, MEM 0040h:0080h, MEM 0040h:0082h

SeeAlso: INT 16/AH=00h

-----K-M0040001E-----

MEM 0040h:001Eh - KEYBOARD - DEFAULT KEYBOARD CIRCULAR BUFFER

Size: 16 WORDs

SeeAlso: MEM 0040h:001Ah, MEM 0040h:001Ch, MEM 0040h:0080h, MEM 0040h:0082h

SeeAlso: INT 16/AH=00h, INT 16/AH=05h

-----B-M0040003E-----

MEM 0040h:003Eh - DISKETTE - RECALIBRATE STATUS

Size: BYTE

SeeAlso: MEM 0040h:003Fh, MEM 0040h:0040h, INT 13/AH=00h, INT 13/AH=11h

Bitfields for diskette recalibrate status:

Bit(s) Description (Table M0012)

7 diskette hardware interrupt occurred

6-4 reserved

3 recalibrate diskette 3 (PC,XT only)

2 recalibrate diskette 2 (PC,XT only)

1 recalibrate diskette 1

0 recalibrate diskette 0

-----B-M0040003F-----

MEM 0040h:003Fh - DISKETTE - MOTOR STATUS

Size: BYTE

SeeAlso: MEM 0040h:003Eh, MEM 0040h:0040h

Bitfields for diskette motor status:

Bit(s) Description (Table M0013)

7 current operation is write or format, rather than read or verify

6 reserved (DMA enabled on 82077)

5-4 diskette drive number selected (0-3)

3 diskette 3 motor on (PC,XT only)

2 diskette 2 motor on (PC,XT only)

1 diskette 1 motor on

0 diskette 0 motor on

-----B-M00400040-----

MEM 0040h:0040h - DISKETTE - MOTOR TURN-OFF TIMEOUT COUNT

Size: BYTE

Desc: number of clock ticks until diskette motor is turned off

Note: the typical implementation of the timeout is to have the INT 08 handler decrement this byte on every clock tick, and force the diskette motor off if the result is equal to zero

SeeAlso: MEM 0040h:003Eh, MEM 0040h:003Fh, MEM 0040h:0041h, INT 08"IRQ0"

-----B-M00400041-----

MEM 0040h:0041h - DISKETTE - LAST OPERATION STATUS

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Size: BYTE

SeeAlso: MEM 0040h:003Eh, MEM 0040h:0042h, INT 13/AH=01h

Bitfields for diskette last operation status:

Bit(s) Description (Table M0014)

7 drive not ready
6 seek error
5 general controller failure
4-0 error reason
00h no error
01h invalid request/parameter
02h address mark not found
03h write-protect error
04h sector not found
06h diskette change line active
08h DMA overrun
09h DMA across 64k boundary
0Ch media type unknown
10h CRC error on read

Note: the following values for this byte differ somewhat from the bitfield definition above:

30h drive does not support media sense
31h no media in drive
32h drive does not support media type
AAh diskette drive not ready

-----B-M00400042-----

MEM 0040h:0042h - DISK - FLOPPY/HARD DRIVE STATUS/COMMAND BYTES

Size: 7 BYTES

SeeAlso: MEM 0040h:0041h

42h BYTE XT: command byte to hard disk controller
AT: write precompensation cylinder number / 4
43h BYTE XT: bit 5 = drive number, bits 3-0=head number
AT: sector count
44h BYTE XT: bits 6,7 = high bits of track, bits 5-0 = start sector-1
AT: starting sector
45h BYTE low byte of track number
46h BYTE XT: sector count
AT: high bits of track number
47h BYTE XT: controlbyte from HD parameters (step rate,...)
AT: 101DHHHH, D=drive number, HHHH=head number
bit 7 = ECC mode (1)
bit 6 = unknown (0)
bit 5 = 512 byte sectors (1)
bit 4 = drive number
bit 3-0 head number
48h BYTE XT: INT 13h subfunction number
AT: command byte to hard disk controller

SeeAlso: CALL F000h:211Eh

-----B-M00400042-----

MEM 0040h:0042h - DISK CONTROLLER STATUS REGISTER 0

Size: BYTE

SeeAlso: MEM 0040h:0043h

Bitfields for diskette controller status register 0:

Bit(s) Description (Table M0015)

- 7-6 interrupt code
 - 00 normal completion
 - 01 abnormal termination during execution
 - 10 invalid command
 - 11 abnormal termination: ready line on/diskette change
- 5 requested seek complete
- 4 drive fault
- 3 drive not ready
- 2 head state at time of interrupt
- 1-0 selected drive (drives 2&3 on PC,XT only)

SeeAlso: #M0016

-----B-M00400043-----

MEM 0040h:0043h - DISK CONTROLLER STATUS REGISTER 1

Size: BYTE

SeeAlso: MEM 0040h:0042h, MEM 0040h:0044h

Bitfields for diskette controller status register 0:

Bit(s) Description (Table M0016)

- 7 attempted access beyond last cylinder
- 6 unused
- 5 CRC error on read
- 4 DMA overrun
- 3 unused
- 2 data error
- 1 disk write protected
- 0 missing address mark

SeeAlso: #M0015, #M0017

-----B-M00400044-----

MEM 0040h:0044h - DISK CONTROLLER STATUS REGISTER 2

Size: BYTE

SeeAlso: MEM 0040h:0043h

Bitfields for diskette controller status register 0:

Bit(s) Description (Table M0017)

- 7 unused
- 6 found deleted data address mark
- 5 CRC error in data field
- 4 wrong cylinder number read
- 3 verify equal
- 2 can't find sector matching verify condition

708 A to Z of C

1 bad cylinder
0 unable to find address mark

SeeAlso: #M0016

-----V-M00400049-----

MEM 0040h:0049h - VIDEO - CURRENT VIDEO MODE

Size: BYTE

SeeAlso: MEM 0040h:004Ah,INT 10/AH=00h

-----V-M0040004A-----

MEM 0040h:004Ah - VIDEO - COLUMNS ON SCREEN

Size: WORD

SeeAlso: MEM 0040h:0049h,MEM 0040h:004Ch,MEM 0040h:004Eh,INT 10/AH=0Fh

-----V-M0040004C-----

MEM 0040h:004Ch - VIDEO - PAGE (REGEN BUFFER) SIZE IN BYTES

Size: WORD

SeeAlso: MEM 0040h:004Ah,MEM 0040h:004Eh,MEM 0040h:0050h

-----V-M0040004E-----

MEM 0040h:004Eh - VIDEO - CURRENT PAGE START ADDRESS IN REGEN BUFFER

Size: WORD

SeeAlso: MEM 0040h:004Ch,MEM 0040h:0050h,MEM 0040h:0062h,INT 10/AH=05h

-----V-M00400050-----

MEM 0040h:0050h - VIDEO - CURSOR POSITIONS

Size: 8 WORDs

Desc: contains row and column position for the cursors on each of eight
video pages

SeeAlso: MEM 0040h:004Eh,MEM 0040h:0060h,INT 10/AH=02h

-----V-M00400060-----

MEM 0040h:0060h - VIDEO - CURSOR TYPE

Size: WORD (big-endian)

Desc: contains cursor start scan line and cursor end scan line

SeeAlso: MEM 0040h:0050h,MEM 0040h:0062h,INT 10/AH=03h

-----V-M00400062-----

MEM 0040h:0062h - VIDEO - CURRENT PAGE NUMBER

Size: BYTE

SeeAlso: MEM 0040h:004Eh,MEM 0040h:0063h,INT 10/AH=05h

-----V-M00400063-----

MEM 0040h:0063h - VIDEO - CRT CONTROLLER BASE I/O PORT ADDRESS

Size: WORD

Note: normally 03B4h for mono and 03D4h for color video boards

SeeAlso: MEM 0040h:0065h,MEM 0040h:0066h

-----V-M00400065-----

MEM 0040h:0065h - VIDEO - CURRENT MODE SELECT REGISTER

Size: BYTE

Desc: contains last value written to I/O port 03B8h / 03D8h

SeeAlso: MEM 0040h:0063h,MEM 0040h:0066h

Bitfields for current video mode select register:

Bit(s)	Description	(Table M0018)
--------	-------------	---------------

7-6	unused	
-----	--------	--

- 5 attribute bit 7 controls blinking instead of background
- 4 mode 6 graphics in monochrome
- 3 video signal enabled
- 2 monochrome
- 1 graphics
- 0 80x25 text

-----V-M00400066-----

MEM 0040h:0066h - VIDEO - CURRENT SETTING OF CGA PALETTE REGISTER

Size: BYTE

Desc: contains the last value written to I/O port 03D9h

SeeAlso: MEM 0040h:0063h, MEM 0040h:0065h, INT 10h/AH=0Bh/BH=01h

Bitfields for CGA palette register:

Bit(s) Description (Table M0019)

- 7-6 unused
- 5 palette (0/1)
- 4 intense background colors in text mode
- 3 intense border color (40x25) / background color (mode 5)
- 2 red
- 1 green
- 0 blue

-----M00400067-----

MEM 0040h:0067h - PC only - CASSETTE TIME COUNT

Size: WORD

SeeAlso: INT 15/AH=00h

-----M00400067-----

MEM 0040h:0067h - RESET RESTART ADDRESS

Size: DWORD

Desc: this address stores the address at which to resume execution after a CPU reset (or jump to F000h:FFF0h) when certain magic values are stored at 0040h:0072h or in CMOS RAM location 0Fh

SeeAlso: MEM 0040h:0072h, MEM F000h:FFF0h, CMOS 0Fh, INT 19

-----M00400069-----

MEM 0040h:0069h - CASSETTE (PC only) - CASSETTE CRC REGISTER

Size: WORD

SeeAlso: MEM 0040h:006Bh"CASSETTE", INT 15/AH=02h

-----M00400069-----

MEM 0040h:0069h - V20-XT-BIOS - KEY REPEAT

Size: BYTE

Bitfields for V20-XT-BIOS key repeat flags:

Bit(s) Description (Table M0020)

- 7 key repeat disabled
- 6 Ctrl-Alt pressed instead of just Alt

-----M0040006B-----

MEM 0040h:006Bh - CASSETTE (PC only) - LAST VALUE READ FROM CASSETTE

Size: BYTE

SeeAlso: MEM 0040h:0069h"CASSETTE", INT 15/AH=02h

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-----M0040006B-----

MEM 0040h:006Bh - POST LAST UNEXPECTED INTERRUPT (XT and later)

Size: BYTE

Desc: this is a bitmask of IRQs which have occurred while the corresponding interrupt vector points at the default system BIOS handler
(bit 0 = IRQ0 to bit 7 = IRQ7; bit 2 = IRQ8-15 on AT and later)

SeeAlso: INT 0F"IRQ7",INT 70"IRQ8",INT 77"IRQ15"

-----M0040006C-----

MEM 0040h:006Ch - TIMER TICKS SINCE MIDNIGHT

Size: DWORD

Desc: updated approximately every 55 milliseconds by the BIOS INT 08 handler

SeeAlso: MEM 0040h:0070h,INT 08"IRQ0",INT 1A/AH=00h

-----M00400070-----

MEM 0040h:0070h - TIMER OVERFLOW

Size: BYTE

Desc: non-zero if timer has counted past midnight since last call to
INT 1A/AH=00h

Note: the original IBM BIOS, and thus most other BIOSes, sets this byte to
01h at midnight; a few (such as the Eagle PC-2) increment it each
time midnight is passed. The former behavior results in lost days
if multiple midnights pass between "get-time" calls while the machine
is powered up.

SeeAlso: MEM 0040h:006Ch,INT 1A/AH=00h

-----K-M00400071-----

MEM 0040h:0071h - Ctrl-Break FLAG

Size: BYTE

Desc: bit 7 is set when Ctrl-Break has been pressed

SeeAlso: INT 1B

-----M00400072-----

MEM 0040h:0072h - POST RESET FLAG

Size: WORD

Desc: specify the action the BIOS should take at the beginning of the
power-on self-test when the machine is reset

SeeAlso: INT 19,MEM F000h:FFF0h

(Table M0021)

Values for POST reset flag:

0000h cold boot

0064h Burn-in mode

1234h to bypass memory test (warm boot)

4321h [PS/2 except Mod 25,30] to preserve memory

5678h [Conv] system suspended

9ABCh [Conv] manufacturing test mode

ABCDh [Conv] POST loop mode

-----B-M00400074-----

MEM 0040h:0074h - FIXED DISK LAST OPERATION STATUS (except ESDI drives)

Size: BYTE

SeeAlso: INT 13/AH=01h,INT 13h/AH=0Ah,MEM 0040h:0041h

(Table M0022)

Values for fixed disk last operation status:

00h	no error
01h	invalid function request
02h	address mark not found
03h	write protect error
04h	sector not found
05h	reset failed
06h	diskette removed
07h	drive parameter activity failed
08h	DMA overrun
09h	DMA data boundary error
0Ah	bad sector flag detected
0Bh	bad track detected
0Ch	requested diskette media type not found (PS/2 or extended BIOS only) unsupported track
0Dh	invalid number of sectors for Format
0Eh	control data address mark detected
0Fh	DMA arbitration level out of range
10h	uncorrectable ECC or CRC error
11h	ECC corrected data error
20h	general controller failed
40h	seek failed
80h	time out
AAh	drive not ready
B0h	volume not locked in drive (INT 13 extensions)
B1h	volume locked in drive (INT 13 extensions)
B2h	volume not removable (INT 13 extensions)
B3h	volume in use (INT 13 extensions)
B4h	lock count exceeded (INT 13 extensions)
B5h	valid eject request failed (INT 13 extensions)
BBh	undefined error
CCh	write fault on selected drive
E0h	status error/error register is zero
FFh	sense failed

SeeAlso: #00234

-----d-M00400074-----

MEM 0040h:0074h - WD1002-27X SuperBIOS - TOTAL DRIVES, FIRST CONTROLLER ONLY

Size: BYTE

SeeAlso: MEM 0040h:0075h"SuperBIOS",MEM 0040h:0076h"SuperBIOS"

-----B-M00400075-----

MEM 0040h:0075h - FIXED DISK - NUMBER OF FIXED DISK DRIVES

Size: BYTE

SeeAlso: MEM 0040h:0076h"FIXED DISK",MEM 0040h:0077h"FIXED DISK"

-----d-M00400075-----

MEM 0040h:0075h - WD1002-27X SuperBIOS - TOTAL FIXED DRIVES, BOTH CONTROLLERS

Size: BYTE

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SeeAlso: MEM 0040h:0074h"SuperBIOS",MEM 0040h:0076h"SuperBIOS"

-----B-M00400076-----

MEM 0040h:0076h - FIXED DISK - CONTROL BYTE {IBM documented only for XT}

Size: BYTE

Desc: loaded from the disk parameter table control byte (offset 8) during various hard disk operations

SeeAlso: MEM 0040h:0075h"FIXED DISK",MEM 0040h:0077h"FIXED DISK"

-----d-M00400076-----

MEM 0040h:0076h - XT: hard disk controller's I/O address (Western Digital)

Size: BYTE

-----d-M00400076-----

MEM 0040h:0076h - WD1002-27X SuperBIOS - USED IN TRACK RECALCULATION

Size: BYTE

SeeAlso: MEM 0040h:0074h"SuperBIOS",MEM 0040h:0075h"SuperBIOS"

SeeAlso: MEM 0040h:0077h"SuperBIOS"

-----B-M00400077-----

MEM 0040h:0077h - FIXED DISK - I/O port offset {IBM documented only for XT}

Size: BYTE

SeeAlso: MEM 0040h:0075h"FIXED DISK",MEM 0040h:0076h"FIXED DISK"

-----d-M00400077-----

MEM 0040h:0077h - WD1002-27X SuperBIOS - USED IN TRACK RECALCULATION

Size: BYTE

SeeAlso: MEM 0040h:0076h"SuperBIOS"

-----B-M00400078-----

MEM 0040h:0078h - PARALLEL DEVICE 1 TIME-OUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT1=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0079h,MEM 0040h:007Ah,INT 17/AH=00h

-----B-M00400079-----

MEM 0040h:0079h - PARALLEL DEVICE 2 TIME-OUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT2=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0078h,MEM 0040h:007Ah,INT 17/AH=00h

-----B-M0040007A-----

MEM 0040h:007Ah - PARALLEL DEVICE 3 TIME-OUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT3=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20).

SeeAlso: MEM 0040h:0078h,MEM 0040h:0079h,MEM 0040h:007Bh"PARALLEL"

-----B-M0040007B-----

MEM 0040h:007Bh - PARALLEL DEVICE 4 TIME-OUT COUNTER (pre-PS, PS Models 25,30)

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS LPT4=(port_address|logical_no)[,[timeout]] directive, where port_address = 200h..3FCh, logical_no = 0 or 1..3, timeout=0..255 (default 20). To avoid any interference with the PS/2 and later interpretation, this will be rejected if this entry does not hold 0, which would indicate it is used for different purposes.

SeeAlso: MEM 0040h:0078h, MEM 0040h:007Ah, MEM 0040h:007Bh"INT 4Bh"

-----m-M0040007B-----

MEM 0040h:007Bh - INT 4Bh FLAGS (PS2 and newer)

Size: BYTE

SeeAlso: INT 4B/AX=8102h

Bitfields for INT 4Bh flags:

Bit(s) Description (Table M0023)

- 7-6 reserved
- 5 set if Virtual DMA Spec supported [PS] (see INT 4B)
- 4 reserved
- 3 set if INT 4Bh intercepted and must be chained
- 2 reserved
- 1 set if Generic SCSI CBIOS services available on INT 4Bh
- 0 reserved

-----B-M0040007C-----

MEM 0040h:007Ch - SERIAL DEVICE 1 TIMEOUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM1=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0000h, MEM 0040h:007Dh, MEM 0040h:007Eh, MEM 0040h:007Fh

SeeAlso: INT 14/AH=01h

-----B-M0040007D-----

MEM 0040h:007Dh - SERIAL DEVICE 2 TIMEOUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM2=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0002h, MEM 0040h:007Ch, MEM 0040h:007Eh, MEM 0040h:007Fh

SeeAlso: INT 14/AH=01h

-----B-M0040007E-----

MEM 0040h:007Eh - SERIAL DEVICE 3 TIMEOUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM3=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

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SeeAlso: MEM 0040h:0004h, MEM 0040h:007Ch, MEM 0040h:007Dh, MEM 0040h:007Fh

SeeAlso: INT 14/AH=01h

-----B-M0040007F-----

MEM 0040h:007Fh - SERIAL DEVICE 4 TIMEOUT COUNTER

Size: BYTE

Note: Under DR-OpenDOS 7.02+ this setting can be changed with the undocumented CONFIG.SYS COM4=[port_address|logical_no][,[timeout]] directive, whereby port_address = 200h..3F8h, logical_no = 0 or 1..4, timeout=0..255 (default 1).

SeeAlso: MEM 0040h:0006h, MEM 0040h:007Ch, MEM 0040h:007Dh, MEM 0040h:007Eh

SeeAlso: INT 14/AH=01h

-----K-M00400080-----

MEM 0040h:0080h - KEYBOARD BUFFER START OFFSET FROM SEGMENT 40h (normally 1Eh)

Size: WORD

SeeAlso: MEM 0040h:001Ah, MEM 0040h:001Eh, MEM 0040h:0082h, INT 16/AH=05h

-----K-M00400082-----

MEM 0040h:0082h - KEYBOARD BUFFER END+1 OFFSET FROM SEGMENT 40h (normally 3Eh)

Size: WORD

Note: XT BIOS dated 11/08/82 ends here

SeeAlso: MEM 0040h:001Ch, MEM 0040h:003Eh, MEM 0040h:0080h, INT 16/AH=05h

-----V-M00400084-----

MEM 0040h:0084h - VIDEO (EGA/MCGA/VGA) - ROWS ON SCREEN MINUS ONE

Size: BYTE

SeeAlso: MEM 0040h:0085h, INT 10/AX=1100h

-----V-M00400085-----

MEM 0040h:0085h - VIDEO (EGA/MCGA/VGA) - CHARACTER HEIGHT IN SCAN-LINES

Size: WORD

SeeAlso: MEM 0040h:0084h, INT 10"LIRVGA19"

!!!

-----V-M00400087-----

MEM 0040h:0087h - VIDEO (EGA/VGA) CONTROL: [MCGA: =00h]

Size: BYTE

SeeAlso: MEM 0040h:0084h, MEM 0040h:0085h, MEM 0040h:0088h

Bitfields for EGA/VGA Video control flags:

Bit(s) Description (Table M0024)

7 do not to clear RAM on mode set (see INT 10h, AH=00h)

6-5 RAM on adapter = (this field + 1) * 64K

4 reserved

3 EGA/VGA video system INactive

2 wait for display enable

1 mono monitor

0 alphanumeric cursor emulation DISabled

When enabled, text mode cursor size (INT 10, AH=01h) settings looking like CGA ones are translated to equivalent EGA/VGA ones.

-----V-M00400088-----

MEM 0040h:0088h - VIDEO (EGA/VGA) SWITCHES: [MCGA: reserved]

Size: BYTE

SeeAlso: MEM 0040h:0087h,MEM 0040h:0089h

Bitfields for EGA/VGA Video switches:

Bit(s) Description (Table M0025)

7-4 power-on state of feature connector bits 3-0

3-0 configuration switches 4-1 (=0 on, =1 off) (see #M0026)

Note: when bit 4 of 0040h:0089h is 0, VGA emulates 350-line EGA if this byte is x3h or x9h, otherwise emulates 200-line CGA in 400-line double scan. VGA resets this byte to x9h after the mode set.

See also note for 0040h:0089h.

(Table M0026)

Values for EGA/VGA configuration switches:

00h Pri MDA,	Sec EGA+old color display 40 x 25
01h Pri MDA,	Sec EGA+old color display 80 x 25
02h Pri MDA,	Sec EGA+ECD normal mode (CGA emul)
03h Pri MDA,	Sec EGA+ECD enhanced mode
04h Pri CGA 40 x 25,	Sec EGA mono display
05h Pri CGA 80 x 25,	Sec EGA mono display
06h Pri EGA+old color display 40 x 25,	Sec MDA
07h Pri EGA+old color display 80 x 25,	Sec MDA
08h Pri EGA+ECD normal mode (CGA emul),	Sec MDA
09h Pri EGA+ECD enhanced mode,	Sec MDA
0Ah Pri EGA mono display,	Sec CGA 40 x 25
0Bh Pri EGA mono display,	Sec CGA 80 x 25

SeeAlso: #M0025

-----b-M00400088-----

MEM 0040h:0088h - Olivetti EGA capabilities???

Size: BYTE???

Bitfields for Olivetti EGA capabilities flags:

Bit(s) Description (Table M0130)

7 640x400 mode related???

6 unknown

5 640x400 mode related???

4-0 unknown

Note: To decide if the 640x400 mode is supported by an Olivetti EGA card (only the Olivetti EGA card 2 supports it), also check that bit 7 and 5 are set.

SeeAlso: C000h:0000h"Olivetti"

-----V-M00400089-----

MEM 0040h:0089h U - VIDEO (MCGA/VGA) - MODE-SET OPTION CONTROL

Size: BYTE

SeeAlso: MEM 0040h:0087h,MEM 0040h:0088h

Bitfields for Video mode-set option control:

Bit(s) Description (Table M0027)

7,4 requested scan lines

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0 0 350-line mode requested
0 1 400-line mode at next mode set
1 0 200-line mode requested
1 1 reserved

Note: Apparently VGA BIOS mode set disregards bit 7 and uses byte 40h:88h to determine 200/350 selection when bit 4 is zero. Presumably bit 7 is a convenience for other purposes. Bit 7 is reset to zero after the mode set.

6 display switching enabled

5 reserved

4 if set: use 400-line mode at next mode set

if clear: [VGA] emulate EGA at next mode set

[MCGA] emulate CGA, digital monitor, 200 lines, 8x8 text

Note: this bit is set by the video mode set on VGA, unchanged on MCGA

3 default palette loading DISabled at mode set

2 mono display

1 gray scale summing enabled

0 [VGA] =1 if VGA active, =0 if not

[MCGA] reserved, zero

Note: the Tseng ET4000 BIOS v3.00 uses bits 6-4 of 88h and bits 6-5 of 89h to specify graphics-mode refresh rates as follows

88h/6 640x480: 1 for 72Hz,0 for 60Hz

88h/5+89h/6 800x600: 00 60Hz

01 56Hz

11 72Hz

88h/4+89h/5 1024x768: 00 interlaced

01 60Hz

10 72Hz???

11 70Hz

-----V-M0040008A-----

MEM 0040h:008Ah U - VIDEO (MCGA/VGA) - INDEX INTO DISPLAY COMBINATION CODE TBL

Size: BYTE

SeeAlso: INT 10/AX=1A00h,#M0039

-----*-M0040008B-----

MEM 0040h:008Bh - PC, PCjr, PC/XT 11/8/82, Convertible - RESERVED

Size: 11 BYTES

-----B-M0040008B-----

MEM 0040h:008Bh - DISKETTE MEDIA CONTROL

Size: BYTE

Bitfields for diskette media control:

Bit(s) Description (Table M0028)

7-6 last data rate set by controller

00=500kbps, 01=300kbps, 10=250kbps, 11=1Mbps

5-4 last diskette drive step rate selected

00=0Ch, 01=0Dh, 10=0Eh, 11=0Ah

3-2 {data rate at start of operation}

1-0 reserved

Note: EHD BIOS sets this byte to 01h and never reads it back

-----B-M0040008C-----

MEM 0040h:008Ch - FIXED DISK - CONTROLLER STATUS [not XT]

Size: BYTE

SeeAlso: MEM 0040h:008Dh, MEM 0040h:008Eh

-----B-M0040008D-----

MEM 0040h:008Dh - FIXED DISK - CONTROLLER ERROR STATUS [not XT]

Size: BYTE

SeeAlso: MEM 0040h:008Ch, MEM 0040h:008Eh

-----B-M0040008E-----

MEM 0040h:008Eh - FIXED DISK - INTERRUPT CONTROL [not XT]

Size: BYTE

Note: cleared to 00h at start of disk operation, set to FFh by IRQ14 handler when hard disk controller completes command

SeeAlso: MEM 0040h:008Ch, MEM 0040h:008Dh, MEM 0040h:008Fh

-----B-M0040008F-----

MEM 0040h:008Fh U - DISKETTE CONTROLLER INFORMATION [not XT]

Size: BYTE

SeeAlso: MEM 0040h:008Ch, MEM 0040h:008Dh, MEM 0040h:008Eh

Bitfields for diskette controller information:

Bit(s) Description (Table M0029)

- 7 reserved
- 6 =1 drive 1 determined
- 5 =1 drive 1 is multi-rate, valid if drive determined
- 4 =1 drive 1 supports 80 tracks, always valid
- 3 reserved
- 2 =1 drive 0 determined
- 1 =1 drive 0 is multi-rate, valid if drive determined
- 0 =1 drive 0 supports 80 tracks, always valid

Note: EHD BIOS sets this byte to 01h and never alters it again

-----B-M00400090-----

MEM 0040h:0090h - DISKETTE DRIVE 0 MEDIA STATE

Size: BYTE

SeeAlso: MEM 0040h:0091h

Bitfields for diskette drive media state:

Bit(s) Description (Table M0030)

- 7-6 data rate
00=500kbps, 01=300kbps, 10=250kbps, 11=1Mbps
- 5 double stepping required (e.g. 360kB in 1.2MB)
- 4 media type established
- 3 drive capable of supporting 4MB media
- 2-0 on exit from BIOS, contains
000 trying 360kB in 360kB
001 trying 360kB in 1.2MB
010 trying 1.2MB in 1.2MB
011 360kB in 360kB established

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100 360kB in 1.2MB established

101 1.2MB in 1.2MB established

110 reserved

111 all other formats/drives

SeeAlso: #M0031,#M0032

-----B-M00400091-----

MEM 0040h:0091h - DISKETTE DRIVE 1 MEDIA STATE

Size: BYTE

SeeAlso: MEM 0040h:0090h,#M0030

-----B-M00400092-----

MEM 0040h:0092h U - DISKETTE DRIVE 0 MEDIA STATE AT START OF OPERATION

Size: BYTE

Note: officially "Drive 2 media state"

SeeAlso: MEM 0040h:0093h"DRIVE 1"

Bitfields for diskette drive 0 media state at start of operation:

Bit(s) Description (Table M0031)

7-3 (see #M0030)

2 multiple data rate capability determined

1 multiple data rate capability

0 =1 if drive has 80 tracks, =0 if 40 tracks

SeeAlso: #M0030,#M0032

-----d-M00400092-----

MEM 0040h:0092h - Olivetti Quaderno - HARD DISK POWERDOWN COUNTDOWN CLOCK TICKS

Size: BYTE

Note: hard disk is turned off when counter reaches zero

-----B-M00400093-----

MEM 0040h:0093h U - DISKETTE DRIVE 1 MEDIA STATE AT START OF OPERATION

Size: BYTE

Note: officially "Drive 3 media state"

SeeAlso: MEM 0040h:0092h"DRIVE 0"

Bitfields for diskette drive 1 media state at start of operation:

Bit(s) Description (Table M0032)

7-3 (see #M0030)

2 multiple data rate capability determined

1 multiple data rate capability

0 =1 if drive has 80 tracks, =0 if 40 tracks

--HP 100LX/200LX--

display control status

0 =1 if DISPCTL -K

1 =1 if DISPCTL -C

-----B-M00400094-----

MEM 0040h:0094h - DISKETTE DRIVE 0 CURRENT TRACK NUMBER

Size: BYTE

SeeAlso: MEM 0040h:0095h

-----B-M00400095-----

MEM 0040h:0095h - DISKETTE DRIVE 1 CURRENT TRACK NUMBER

Size: BYTE

SeeAlso: MEM 0040h:0094h

-----K-M00400096-----

MEM 0040h:0096h - KEYBOARD STATUS BYTE 1

Size: BYTE

SeeAlso: MEM 0040h:0097h,INT 16/AH=11h

Bitfields for keyboard status byte 1:

Bit(s) Description (Table M0033)

- 7 =1 read-ID in progress
- 6 =1 last code read was first of two ID codes
- 5 =1 force Num Lock if read-ID and enhanced keyboard
- 4 =1 enhanced keyboard installed
- 3 =1 Right Alt pressed
- 2 =1 Right Ctrl pressed
- 1 =1 last code read was E0h
- 0 =1 last code read was E1h

SeeAlso: #M0034,#M0010

-----K-M00400097-----

MEM 0040h:0097h - KEYBOARD STATUS BYTE 2

Size: BYTE

SeeAlso: MEM 0040h:0096h,INT 16/AH=11h

Bitfields for keyboard status byte 2:

Bit(s) Description (Table M0034)

- 7 =1 keyboard transmit error flag
- 6 =1 LED update in progress
- 5 =1 RESEND received from keyboard
- 4 =1 ACK received from keyboard
- 3 reserved, must be zero
- 2 Caps Lock LED
- 1 Num Lock LED
- 0 Scroll Lock LED

SeeAlso: #M0033,#M0010

-----B-M00400098-----

MEM 0040h:0098h - TIMER2 (AT, PS exc Mod 30) - PTR TO USER WAIT-COMplete FLAG

Size: DWORD

Note: (see INT 15/AX=8300h)

SeeAlso: MEM 0040h:009Ch,INT 15/AH=83h,INT 15/AH=86h

-----B-M0040009C-----

MEM 0040h:009Ch - TIMER2 (AT, PS exc Mod 30) - USER WAIT COUNT IN MICROSECONDS

Size: DWORD

SeeAlso: MEM 0040h:0098h,MEM 0040h:00A0h,INT 15/AH=83h,INT 15/AH=86h

-----V-M0040009F-----

MEM 0040h:009Fh - HP 100LX/200LX - VIDEO ZOOM MODE

Size: BYTE

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(Table M0035)

Values for HP 100LX/200LX video zoom mode:

02h	80x25 mono
03h	80x25 color
80h	64x18 mono
81h	64x18 color
82h	40x25 mono
83h	40x25 color
84h	40x16 mono
85h	40x16 color

SeeAlso: INT 10/AH=D0h

-----B-M004000A0-----

MEM 0040h:00A0h - TIMER2 (AT, PS exc Mod 30) - WAIT ACTIVE FLAG

Size: BYTE

SeeAlso: MEM 0040h:009Ch,INT 15/AH=83h,INT 15/AH=86h

Bitfields for Timer2 wait active flag:

Bit(s) Description (Table M0036)

7	wait time elapsed
6-1	reserved
0	INT 15/AH=86h has occurred

-----N-M004000A1-----

MEM 0040h:00A1h - BIT 5 SET IF LAN SUPPORT PROGRAM INTERRUPT ARBITRATOR PRESENT

Size: BYTE

Note: DEVICE=DXMA0MOD.SYS

-----N-M004000A2-----

MEM 0040h:00A2h - RESERVED FOR NETWORK ADAPTERS

Size: 6 BYTES

-----d-M004000A4-----

MEM 0040h:00A4h - PS/2 Mod 30 - SAVED FIXED DISK INTERRUPT VECTOR

Size: DWORD

-----V-M004000A8-----

MEM 0040h:00A8h - VIDEO (EGA/MCGA/VGA) - POINTER TO VIDEO SAVE POINTER TABLE

Size: DWORD

SeeAlso: INT 10/AH=1Ch

Format of Video Save Pointer Table [EGA/VGA/MCGA only]:

Offset Size Description (Table M0037)

00h	DWORD	ptr to Video Parameter Table
04h	DWORD	ptr to Parameter Dynamic Save Area, else 0 [EGA/VGA only]
08h	DWORD	ptr to Alphanumeric Character Set Override, else 0
0Ch	DWORD	ptr to Graphics Character Set Override, else 0
10h	DWORD	[VGA only] ptr to Secondary Save Pointer Table, must be valid
14h	DWORD	reserved, zero
18h	DWORD	reserved, zero

Note: table initially in ROM, copy to RAM to alter, then update 40h:A8h.

Format of Secondary Video Save Pointer Table [VGA only]:

Offset	Size	Description	(Table M0038)
00h	WORD	Length of this table in bytes, including this word	(1Ah)
02h	DWORD	ptr to Display Combination Code Table, must be valid	
06h	DWORD	ptr to second Alphanumeric Character Set Override, else 0	
0Ah	DWORD	ptr to User Palette Profile Table, else 0	
0Eh	DWORD	reserved, zero	
12h	DWORD	reserved, zero	
16h	DWORD	reserved, zero	

Note: table initially in ROM, copy to RAM to alter, then alter Save Ptr Table.

Format of Display Combination Code Table [VGA only]:

Offset	Size	Description	(Table M0039)
00h	BYTE	Number of entries in the DCC table at offset 04h	
01h	BYTE	Version number	
02h	BYTE	Maximum display type code that can appear in DCC table	
03h	BYTE	reserved	
04h	2N BYTES	Each pair of bytes gives a valid display combination, one display type per byte (see #M0040)	

(Table M0040)

Values for Display Combination display type:

00h	no display
01h	MDA with mono display
02h	CGA with color display
03h	reserved
04h	EGA with color display
05h	EGA with mono display
06h	Professional Graphics Controller
07h	VGA with mono display
08h	VGA with color display
09h	reserved
0Ah	MCGA with digital color display
0Bh	MCGA with analog mono display
0Ch	MCGA with analog color display
FFh	unrecognised video system

SeeAlso: #M0039

Format of Video Parameter Table [EGA, VGA only]:

Offset	Size	Description	(Table M0041)
00h-03h		Modes 00h-03h in 200-line CGA emulation mode	
04h-0Eh		Modes 04h-0Eh	
0Fh-10h		Modes 0Fh-10h when only 64kB RAM on adapter	
11h-12h		Modes 0Fh-10h when >64kB RAM on adapter	
13h-16h		Modes 00h-03h in 350-line mode	
17h		VGA Modes 00h or 01h in 400-line mode	
18h		VGA Modes 02h or 03h in 400-line mode	
19h		VGA Mode 07h in 400-line mode	
1Ah-1Ch		VGA Modes 11h-13h	

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Note: An array of 23 [EGA] or 29 [VGA] elements, each element being 64 bytes long. Elements appear in the above order.

Format of Video Parameter Table element [EGA, VGA only]:

Offset	Size	Description	(Table M0042)
00h	BYTE	Columns on screen	(see 40h:4Ah)
01h	BYTE	Rows on screen minus one	(see 40h:84h)
02h	BYTE	Height of character in scan lines	(see 40h:85h)
03h	WORD	Size of video buffer	(see 40h:4Ch)
05h	4 BYTES	Values for Sequencer Registers 1-4	
09h	BYTE	Value for Miscellaneous Output Register	
0Ah	25 BYTES	Values for CRTC Registers 00h-18h	
23h	20 BYTES	Values for Attribute Controller Registers 00h-13h	
37h	9 BYTES	Values for Graphics Controller Registers 00h-08h	

Format of Video Parameter Table [MCGA only] {guesswork from inspection}:

Offset	Size	Description	(Table M0043)
- 16 triplet BYTES of R,G,B DAC info for 16 colors;			
- An array of 11 elements, each element being 32 bytes long.			
Elements appear in the order:			

- Modes 00h,01h in 200-line mode for digital displays
- Modes 00h,01h in 400-line mode for analog displays
- Modes 02h,03h in 200-line mode for digital displays
- Modes 02h,03h in 400-line mode for analog displays
- Modes 04h,05h in 200-line mode for digital displays
- Modes 04h,05h in 400-line mode for analog displays
- Mode 06h in 200-line mode for digital displays
- Mode 06h in 400-line mode for analog displays
- Mode 11h
- Mode 13h in 200-line mode for digital displays
- Mode 13h in 400-line mode for analog displays

Format of Video Parameter Table element [MCGA only]:

Offset	Size	Description	(Table M0044)
00h	BYTE	Columns on screen	(see 40h:4Ah)
01h	BYTE	Rows on screen minus one	(see 40h:84h)
02h	BYTE	Height of character in scan lines	(see 40h:85h)
03h	WORD	Size of video buffer	(see 40h:4Ch)
05h	WORD	??? always zero	
07h	21 BYTES	Video data registers 00h-14h to port 3D5h indexed by 3D4h	
1Ch	BYTE	PEL Mask to port 3C6h	
1Dh	BYTE	CGA Mode Control to port 3D8h	
1Eh	BYTE	CGA Border Control to port 3D9h	
1Fh	BYTE	Extended Mode Control to port 3DDh	

Format of Video Parameter Dynamic Save Area [EGA, VGA only]:

Offset	Size	Description	(Table M0045)
00h	16 BYTES	Last data written to Attribute Contr. Palette Registers 0-15	

10h BYTE Last data written to Attribute Controller Overscan Register
 11h-FFh Reserved
 Note: Need for table was that EGA registers were write-only.
 Note: If default values (from the Video Parameter Table) are over-ridden at a mode set by the VGA User Palette Profile Table, then the Dynamic Save Area is updated with the default values, not the User Profile ones.

Format of Alphanumeric Character Set Override:

Offset	Size	Description (Table M0046)
00h	BYTE	Length in bytes of each character in font table
01h	BYTE	Character generator RAM bank to load, 0=normal
02h	WORD	Number of characters in font table, normally 256
04h	WORD	Code of first character in font table, normally 0
06h	DWORD	ptr to font table
0Ah	BYTE	Displayable rows (FFh=use maximum calculated value)
0Bh	BYTES	Array of mode values to which this font is to pertain
	BYTE	FFh end of array

Format of Second Alphanumeric Character Set Override:

Offset	Size	Description (Table M0047)
00h	BYTE	Length in bytes of each character in font table
01h	BYTE	Character generator RAM bank to load, normally non-zero
02h	BYTE	reserved
03h	DWORD	ptr to font table
07h	BYTES	Array of mode values to which this font is to pertain
	BYTE	FFh end of array

Note: Authorities differ, some say same as first override above, but IBM says it is as shown above

Format of Graphics Character Set Override:

Offset	Size	Description (Table M0048)
00h	BYTE	Number of displayable character rows
01h	WORD	Length in bytes of each character in font table
03h	DWORD	ptr to font table
07h	BYTES	Array of mode values to which this font is to pertain
	BYTE	FFh end of array

Format of User Palette Profile Table [VGA only]:

Offset	Size	Description (Table M0049)
00h	BYTE	Underlining: 01h=enable in all alphanumeric modes 00h=enable in monochrome alphanumeric modes only FFh=disable in all alphanumeric modes
01h	BYTE	reserved
02h	WORD	reserved
04h	WORD	Number (0-17) of Attribute Controller registers in table
06h	WORD	Index (0-16) of first Attribute Controller register in table
08h	DWORD	ptr to table of Attribute Controller registers to override

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Table is an array of BYTEs.

0Ch WORD Number (0-256) of video DAC Color registers in table
0Eh WORD Index (0-255) of first video DAC Color register in table
10h DWORD ptr to table of video DAC Color registers to override
Table is ??? triplets ??? of BYTEs???
14h BYTEs array of mode values to which this profile is to pertain
BYTE FFh end of array

-----*-M004000AC-----

MEM 0040h:00ACh - RESERVED

Size: 4 BYTEs

-----b-M004000B0-----

MEM 0040h:00B0h - Phoenix 386 BIOS 1.10 10a - LOOP COUNT FOR HARD DISK TIMEOUT

Size: BYTE

Desc: number of times a tight software delay loop should be executed to
generate the sub-55ms delays used internally by the BIOS

Note: also used for delaying when beeping due to full keyboard buffer

SeeAlso: MEM 0040h:00ECh"Dell",INT 15/AH=BCh

-----d-M004000B0-----

MEM 0040h:00B0h - PTR TO 3363 OPTICAL DISK DRIVER OR BIOS ENTRY POINT

Size: DWORD

Notes: When 3363 BIOS present, the ASCIZ signature "OPTIC "occurs 3 bytes
beyond this entry point

When 3363 BIOS and 3363 File System Driver present, the ASCIZ signature
"FILE SYSTEM DRIVER" occurs 3 bytes beyond this entry point

-----b-M004000B0-----

MEM 0040h:00B0h - 1988 Phoenix 386 BIOS 1.10 03 - PARAMS FOR TYPE 48 HARD DISK

Size: 16 BYTEs

SeeAlso: INT 41,INT 46, MEM 0040h:00C0h"HARD DISK"

-----*-M004000B4-----

MEM 0040h:00B4h - RESERVED

Size: WORD

-----b-M004000B5-----

MEM 0040h:00B5h - Dell 4xxDE

Size: BYTE

Bitfields for Dell 4xxDE flags:

Bit(s) Description (Table M0050)

2 ??? (related to disk drives)

5 page tables set to allow Weitek addressing in real mode

6 Weitek math coprocessor present

-----b-M004000B5-----

MEM 0040h:00B5h - Tandy BIOS DATA FLAGS

Size: BYTE

SeeAlso: MEM F000h:C000h

Bitfields for Tandy BIOS data flags:

Bit(s) Description (Table M0131)

0 set if drive A: is 720 Kb

- 1 set if drive B: is 720 Kb
- 2-7 unknown

Note: Before checking these bits, the Tandy ROM BIOS ID byte at F000h:C000h should be verified to be equal to 21h.

 MEM 0040h:00E5h - Gigabyte AWARD v4.51PG - ASSOC DRIVE NUMS TO PHYS INTERFACES
 Size: BYTE
 SeeAlso: MEM 0040h:00E5h"AWARD"

Bitfields for drive number/interface mapping:
 Bit(s) Description (Table M0129)
 7-6 interface for drive 83h (F:)
 00 primary master
 01 primary slave
 10 secondary master
 11 secondary slave
 5-4 interface for drive 82h (as for bits 7-6)
 3-2 interface for drive 81h (as for bits 7-6)
 1-0 interface for drive 80h (C:) (as for bits 7-6)

SeeAlso: #M0128
 -----M004000B6-----
 MEM 0040h:00B6h - RESERVED FOR POST???

Size: 3 BYTES
 -----M004000B9-----
 MEM 0040h:00B9h - ???

Size: 7 BYTES
 -----b-M004000BC-----
 MEM 0040h:00BCh - 1993 Phoenix 486 BIOS 1.03 PCI - CPU TYPE/MASK REVISION
 Size: WORD
 Desc: the high byte contains the CPU type, the low byte the mask revision
 (steping level), as reported to the BIOS in DX by the CPU at startup

SeeAlso: INT 15/AH=C9h
 -----b-M004000C0-----
 MEM 0040h:00C0h - 1988 Phoenix 386 BIOS 1.10 03 - PARAMS FOR TYPE 49 HARD DISK
 Size: 16 BYTES

SeeAlso: INT 41,INT 46, MEM 0040h:00B0h"HARD DISK"
 -----*-M004000C0-----

MEM 0040h:00C0h - RESERVED
 Size: 14 BYTES
 -----K-M004000C2-----

MEM 0040h:00C2h - AMI BIOS 1.00.12.AX1T - KEYBOARD TYPE
 Size: WORD
 Desc: this word contains an indication of the type of keyboard
 (controller???) attached to the system
 Note: AMI's APM code checks for 4147h vs. other value (5047h seen on Intel
 "Plato" motherboard)

SeeAlso: #00586,INT 16/AH=F2h
 -----b-M004000CE-----