

Dr. Eli Flaxer

Bios Data Area - PC Memory Map

Address	Size	Description
00:00	256dwords	Interrupt vector table
30:00	256bytes	Stack area used during post and bootstrap
40:00	word	COM1 port address
40:02	word	COM2 port address
40:04	word	COM3 port address
40:06	word	COM4 port address
40:08	word	LPT1 port address
40:0A	word	LPT2 port address
40:0C	word	LPT3 port address
40:0E	word	LPT4 port address (except PS/2) Extended BIOS Data Area segment (PS/2, see ~EBDA~)
40:10	2 bytes	Equipment list flags (see ~INT 11~)

```

|7|6|5|4|3|2|1|0| 40:10 (value in INT 11 register AL)
|_|_|_|_|_|_|_|_ IPL diskette installed
|_|_|_|_|_|_|_ math coprocessor
|_|_|_|_|_|_|_ old PC system board RAM < 256K
|_|_|_|_|_|_|_ pointing device installed (PS/2)
|_|_|_|_|_|_|_ not used on PS/2
|_|_|_|_|_|_|_ initial video mode
|_|_|_|_|_|_|_ # of diskette drives, less 1
    
```

```

|7|6|5|4|3|2|1|0| 40:11 (value in INT 11 register AH)
|_|_|_|_|_|_|_|_ 0 if DMA installed
|_|_|_|_|_|_|_|_ number of serial ports
|_|_|_|_|_|_|_|_ game adapter
|_|_|_|_|_|_|_|_ not used, internal modem (PS/2)
|_|_|_|_|_|_|_|_ number of printer ports
    
```

40:12	byte	PCjr: infrared keyboard link error count
40:13	word	Memory size in Kbytes (see ~INT 12~)
40:15	byte	Reserved
40:16	byte	PS/2 BIOS control flags

40:17 byte Keyboard flag byte 0 (see ~KB FLAGS~)

```
|7|6|5|4|3|2|1|0| keyboard flag byte 0
| | | | | | | |__ right shift key depressed
| | | | | | |__ left shift key depressed
| | | | | |__ CTRL key depressed
| | | | |__ ALT key depressed
| | | |__ scroll-lock is active
| | |__ num-lock is active
| |__ caps-lock is active
|__ insert is active
```

40:18 byte Keyboard flag byte 1 (see ~KB FLAGS~)

```
|7|6|5|4|3|2|1|0| keyboard flag byte
| | | | | | | |__ left CTRL key depressed
| | | | | | |__ left ALT key depressed
| | | | | |__ system key depressed and held
| | | | | |__ suspend key has been toggled
| | | | |__ scroll lock key is depressed
| | |__ num-lock key is depressed
| |__ caps-lock key is depressed
|__ insert key is depressed
```

- 40:19 byte Storage for alternate keypad entry
- 40:1A word Offset from 40:00 to keyboard buffer head
- 40:1C word Offset from 40:00 to keyboard buffer tail
- 40:1E 32bytes Keyboard buffer (circular queue buffer)
- 40:3E byte Drive recalibration status

```
|7|6|5|4|3|2|1|0| drive recalibration status
| | | | | | | |__ 1=recalibrate drive 0
| | | | | | |__ 1=recalibrate drive 1
| | | | | |__ 1=recalibrate drive 2
| | | | |__ 1=recalibrate drive 3
| | | |__ unused
|__ 1=working interrupt flag
```

Bios Data Area - PC Memory Map

```
40:3F  byte    Diskette motor status

      |7|6|5|4|3|2|1|0| diskette motor status
      | | | | | | | |__ 1=drive 0 motor on
      | | | | | | | |__ 1=drive 1 motor on
      | | | | | | | |__ 1=drive 2 motor on
      | | | | | | | |__ 1=drive 3 motor on
      | | | | | | | |__ unused
      | | | | | | | |__ 1=write operation

40:40  byte    Motor shutoff counter (decremented by ~INT 8~)
40:41  byte    Status of last diskette operation (see ~INT 13,1~)

      |7|6|5|4|3|2|1|0| status of last diskette operation
      | | | | | | | |__ invalid diskette command
      | | | | | | | |__ diskette address mark not found
      | | | | | | | |__ sector not found
      | | | | | | | |__ diskette DMA error
      | | | | | | | |__ CRC check / data error
      | | | | | | | |__ diskette controller failure
      | | | | | | | |__ seek to track failed
      | | | | | | | |__ diskette time-out

40:42  7 bytes  NEC diskette controller status (see ~FDC~)
40:49  byte    Current video mode (see ~VIDEO MODE~)
40:4A  word    Number of screen columns
40:4C  word    Size of current video regen buffer in bytes
40:4E  word    Offset of current video page in video regen buffer
40:50  8 words  Cursor position of pages 1-8, high order byte=row
              low order byte=column; changing this data isn't
              reflected immediately on the display

40:60  byte    Cursor ending (bottom) scan line (don't modify)
40:61  byte    Cursor starting (top) scan line (don't modify)
40:62  byte    Active display page number
40:63  word    Base port address for active ~6845~ CRT controller
              3B4h = mono, 3D4h = color
40:65  byte    6845 CRT mode control register value (port 3x8h)
              EGA/VGA values emulate those of the MDA/CGA
40:66  byte    CGA current color palette mask setting (port 3d9h)
              EGA and VGA values emulate the CGA
```

Bios Data Area - PC Memory Map

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40:67    dword    CS:IP for 286 return from protected mode
         dword    Temp storage for SS:SP during shutdown
         dword    Day counter on all products after AT
         dword    PS/2 Pointer to reset code with memory preserved
         5 bytes  Cassette tape control (before AT)
40:6C    dword    Daily timer counter, equal to zero at midnight;
         incremented by INT 8; read/set by ~INT 1A~
40:70    byte     Clock rollover flag, set when 40:6C exceeds 24hrs
40:71    byte     BIOS break flag, bit 7 is set if ~Ctrl-Break~ was
         *ever* hit; set by ~INT 9~
40:72    word     Soft reset flag via Ctl-Alt-Del or JMP FFFF:0

         1234h  Bypass memory tests & CRT initialization
         4321h  Preserve memory
         5678h  System suspend
         9ABCh  Manufacturer test
         ABCDh  Convertible POST loop
         ???h  many other values are used during POST

40:74    byte     Status of last hard disk operation (see ~INT 13,1~)
40:75    byte     Number of hard disks attached
40:76    byte     XT fixed disk drive control byte
40:77    byte     Port offset to current fixed disk adapter
40:78    4 bytes  Time-Out value for LPT1,LPT2,LPT3(,LPT4 except PS/2)
40:7C    4 bytes  Time-Out value for COM1,COM2,COM3,COM4
40:80    word     Keyboard buffer start offset (seg=40h,BIOS 10-27-82)
40:82    word     Keyboard buffer end offset (seg=40h,BIOS 10-27-82)
40:84    byte     Rows on the screen (less 1, EGA+)
40:85    word     Point height of character matrix (EGA+)
         byte     PCjr: character to be repeated if the typematic
         repeat key takes effect
40:86    byte     PCjr: initial delay before repeat key action begins
40:87    byte     PCjr: current Fn function key number
         byte     Video mode options (EGA+)

|7|6|5|4|3|2|1|0| Video mode options (EGA+)
|_|_|_|_|_|_|_|_| 1=alphanumeric cursor emulation enabled
|_|_|_|_|_|_|_|_| 1=video subsystem attached to monochrome
|_|_|_|_|_|_|_|_| reserved
|_|_|_|_|_|_|_|_| 1=video subsystem is inactive
|_|_|_|_|_|_|_|_| reserved
|_|_|_|_|_|_|_|_| video RAM 00-64K 10-192K 01-128K 11-256K
|_|_|_|_|_|_|_|_| video mode number passed to ~INT 10~, function 0

```

Bios Data Area - PC Memory Map

40:88 byte PCjr: third keyboard status byte
 EGA feature bit switches, emulated on VGA

```
|7|6|5|4|3|2|1|0| EGA feature bit switches (EGA+)
| | | | | | | |__ EGA SW1 config (1=off)
| | | | | | |__ EGA SW2 config (1=off)
| | | | | |__ EGA SW3 config (1=off)
| | | | |__ EGA SW4 config (1=off)
| | | |__ Input FEAT0 (ISR0 bit 5) after output on FCR0
| | |__ Input FEAT0 (ISR0 bit 6) after output on FCR0
| |__ Input FEAT1 (ISR0 bit 5) after output on FCR1
|__ Input FEAT1 (ISR0 bit 6) after output on FCR1
```

40:89 byte Video display data area (MCGA and VGA)

```
|7|6|5|4|3|2|1|0| Video display data area (MCGA and VGA)
| | | | | | | |__ 1=VGA is active
| | | | | | |__ 1=gray scale is enabled
| | | | | |__ 1=using monochrome monitor
| | | | |__ 1=default palette loading is disabled
| | | |__ see table below
| | |__ reserved
| |__ 1=display switching enabled
|__ alphanumeric scan lines (see table below)
```

Bit7	Bit4	Scan Lines
0	0	350 line mode
0	1	400 line mode
1	0	200 line mode
1	1	reserved

40:8A byte Display Combination Code (DCC) table index (EGA+)

40:8B byte Last diskette data rate selected

```
|7|6|5|4|3|2|1|0| last diskette data rate selected
| | | | | _ | _ | _ |__ reserved
| | | _ |__ last floppy drive step rate selected
| _ |__ last floppy data rate selected
```

Data Rate	Step Rate
00 500K bps	00 step rate time of 0C
01 300K bps	01 step rate time of 0D

Bios Data Area - PC Memory Map

```

10 250K bps          10 step rate time of 0A
11 reserved        11 reserved

```

```

40:8C byte    Hard disk status returned by controller
40:8D byte    Hard disk error returned by controller
40:8E byte    Hard disk interrupt control flag(bit 7=working int)
40:8F byte    Combination hard/floppy disk card when bit 0 set
40:90 4 bytes Drive 0,1,2,3 media state

```

```

|7|6|5|4|3|2|1|0| drive media state (4 copies)
| | | | | | | | | drive/media state (see below)
| | | | | | | | | reserved
| | | | | | | | | 1=media/drive established
| | | | | | | | | double stepping required
|_|_|_| data rate:  00=500K bps    01=300K bps
                    10=250K bps    11=reserved

```

Bits

```

210 Drive Media State
000 360Kb diskette/360Kb drive not established
001 360Kb diskette/1.2Mb drive not established
010 1.2Mb diskette/1.2Mb drive not established
011 360Kb diskette/360Kb drive established
100 360Kb diskette/1.2Mb drive established
101 1.2Mb diskette/1.2Mb drive established
110 Reserved
111 None of the above

```

```

40:94 byte    Track currently seeked to on drive 0
40:95 byte    Track currently seeked to on drive 1
40:96 byte    Keyboard mode/type

```

```

|7|6|5|4|3|2|1|0| Keyboard mode/type
| | | | | | | | | last code was the E1 hidden code
| | | | | | | | | last code was the E0 hidden code
| | | | | | | | | right CTRL key depressed
| | | | | | | | | right ALT key depressed
| | | | | | | | | 101/102 enhanced keyboard installed
| | | | | | | | | force num-lock if Rd ID & KBX
| | | | | | | | | last char was first ID char
| | | | | | | | | read ID in process

```

Bios Data Area - PC Memory Map

40:97 byte Keyboard LED flags

```
|7|6|5|4|3|2|1|0| Keyboard LED flags
|_|_|_|_|_|_|_| scroll lock indicator
|_|_|_|_|_|_|_| num-lock indicator
|_|_|_|_|_|_|_| caps-lock indicator
|_|_|_|_|_|_|_| circus system indicator
|_|_|_|_|_|_|_| ACK received
|_|_|_|_|_|_|_| re-send received flag
|_|_|_|_|_|_|_| mode indicator update
|_|_|_|_|_|_|_| keyboard transmit error flag
```

40:98 dword Pointer to user wait complete flag

40:9C dword User wait Time-Out value in microseconds

40:A0 byte RTC wait function flag

```
|7|6|5|4|3|2|1|0| ~INT 15,86~ RTC wait function flag
|_|_|_|_|_|_|_| 1= wait pending
|_|_|_|_|_|_|_| not used
|_|_|_|_|_|_|_| 1=INT 15,86 wait time elapsed
```

40:A1 byte LANA DMA channel flags

40:A2 2 bytes Status of LANA 0,1

40:A4 dword Saved hard disk interrupt vector

40:A8 dword BIOS Video Save/Override Pointer Table address
(see ~VIDEO TABLES~)

40:AC 8 bytes Reserved

40:B4 byte Keyboard NMI control flags (convertible)

40:B5 dword Keyboard break pending flags (convertible)

40:B9 byte Port 60 single byte queue (convertible)

40:BA byte Scan code of last key (convertible)

40:BB byte NMI buffer head pointer (convertible)

40:BC byte NMI buffer tail pointer (convertible)

40:BD 16bytes NMI scan code buffer (convertible)

40:CE word Day counter (convertible and after)

40:F0 16bytes Intra-Applications Communications Area (IBM Technical
Reference incorrectly locates this at 50:F0-50:FF)