

Intel Defined CPU Exception Table (see notes)

| Interrupt | Function |
|-----------|--|
| 0 | Divide by zero |
| 1 | Single step |
| 2 | Non-maskable (NMI) |
| 3 | Breakpoint |
| 4 | Overflow trap |
| 5 | BOUND range exceeded (186,286,386) |
| 6 | Invalid opcode (186,286,386) |
| 7 | Coprocessor not available (286,386) |
| 8 | Double fault exception (286,386) |
| 9 | Coprocessor segment overrun (286,386) |
| A | Invalid task state segment (286,386) |
| B | Segment not present (286,386) |
| C | Stack exception (286,386) |
| D | General protection exception (286,386) |
| E | Page fault (286,386) |
| F | Reserved |
| 10 | Coprocessor error (286,386) |

IBM PC Hardware Interrupt Table (in order of priority)

| IRQ# | Interrupt | Function |
|-------|-----------|--|
| IRQ0 | 8 | <u>timer</u> (55ms intervals, 18.2 per second) |
| IRQ1 | 9 | keyboard service required |
| IRQ2 | A | slave <u>8259</u> or EGA/VGA vertical retrace |
| IRQ8 | 70 | real time clock (AT,XT286,PS50+) |
| IRQ9 | 71 | software redirected to IRQ2 (AT,XT286,PS50+) |
| IRQ10 | 72 | reserved (AT,XT286,PS50+) |
| IRQ11 | 73 | reserved (AT,XT286,PS50+) |
| IRQ12 | 74 | mouse interrupt (PS50+) |
| IRQ13 | 75 | numeric coprocessor error (AT,XT286,PS50+) |
| IRQ14 | 76 | fixed disk controller (AT,XT286,PS50+) |
| IRQ15 | 77 | reserved (AT,XT286,PS50+) |
| IRQ3 | B | COM2 or COM4 service required, (COM3-COM8 on MCA PS/2) |
| IRQ4 | C | COM1 or COM3 service required |
| IRQ5 | D | fixed disk or data request from LPT2 |
| IRQ6 | E | floppy disk service required |
| IRQ7 | F | data request from LPT1 (unreliable on IBM mono) |

Interrupt Table as Implemented by System BIOS/DOS

| INT # | Locus | Function |
|-------|-------|----------------|
| 0 | CPU | divide by zero |
| 1 | CPU | single step |

| | | |
|-------|------|---|
| 2 | CPU | non-maskable |
| 3 | CPU | breakpoint |
| 4 | CPU | overflow trap |
| 5 | BIOS | print screen |
| 6 | CPU | Invalid opcode (186,286,386) |
| 7 | CPU | coprocessor not available (286,386) |
| 8 | IRQ0 | timer (55ms intervals, 18.21590 per second) |
| 9 | IRQ1 | keyboard service required (see INT 9) |
| A | IRQ2 | slave 8259 or EGA/VGA vertical retrace |
| B | IRQ3 | COM2 service required (PS/2 MCA COM3-COM8) |
| C | IRQ4 | COM1 service required |
| D | IRQ5 | fixed disk or data request from LPT2 |
| E | IRQ6 | floppy disk service required |
| F | IRQ7 | data request from LPT1 (unreliable on IBM mono) |
| 10 | BIOS | video (see INT 10) |
| 11 | BIOS | Equipment determination (see INT 11) |
| 12 | BIOS | memory size (see INT 12) |
| 13 | BIOS | disk I/O service (see INT 13) |
| 14 | BIOS | serial communications (see INT 14) |
| 15 | BIOS | system services, cassette (see INT 15) |
| 16 | BIOS | keyboard services (see INT 16) |
| 17 | BIOS | parallel printer (see INT 17) |
| 18 | BIOS | ROM BASIC loader |
| 19 | BIOS | bootstrap loader (unreliable, see INT 19) |
| 1A | BIOS | time of day (see INT 1A) |
| 1B | BIOS | user defined ctrl-break handler (see INT 1B) |
| 1C | BIOS | user defined clock tick handler (see INT 1C) |
| 1D | BIOS | 6845 video parameter pointer |
| 1E | BIOS | diskette parameter pointer (base table) |
| 1F | BIOS | graphics character table |
| 20 | DOS | general program termination |
| 21 | DOS | function request services (see INT 21) |
| 22 | DOS | terminate address (see INT 22) |
| 23 | DOS | control break termination address (see INT 23) |
| 24 | DOS | critical error handler (see INT 24) |
| 25 | DOS | absolute disk read (see INT 25) |
| 26 | DOS | absolute disk write (see INT 26) |
| 27 | DOS | terminate and stay resident (see INT 27) |
| 28 | DOS | idle loop, issued by DOS when idle (see INT 28) |
| 29 | DOS | fast TTY console I/O (see INT 29) |
| 2A | DOS | critical section and NETBIOS (see INT 2A) |
| 2B | DOS | internal, simple IRET in DOS 2.0-5.0 |
| 2C | DOS | internal, simple IRET in DOS 2.0-5.0 |
| 2D | DOS | internal, simple IRET in DOS 2.0-5.0 |
| 2E | DOS | exec command from base level command interpreter (see INT 2E) |
| 2F | DOS | multiplexer (see INT 2F) |
| 30-31 | CPM | far jump vector for CPM (not an interrupt) |
| 31 | DPMI | DOS Protected Mode Interface (for DOS extenders) |
| 32 | | reserved |
| 33 | | mouse support (see INT 33) |
| 34-3E | | Microsoft/Borland floating point emulation |
| 3F | | overlay manager |
| 40 | BIOS | hard disk |
| 41 | BIOS | fixed disk 0 parameters pointer (see INT 13,9) |
| 42 | BIOS | relocated video handler (EGA/VGA/PS) |
| 43 | BIOS | user font table (EGA/VGA/PS) |
| 44 | BIOS | first 128 graphics characters (also Netware) |

| | | | |
|-------|---------|--|-----------|
| | | | int table |
| 45 | BIOS | reserved for BIOS | |
| 46 | BIOS | fixed disk 1 parameters ptr (see INT 13,9 /INT 41) | |
| 47 | BIOS | reserved for BIOS | |
| 48 | BIOS | PCjr cordless keyboard translation | |
| 49 | BIOS | PCjr non-keyboard scancode translation table | |
| 4A | BIOS | user alarm (AT,CONV,PS/2) (see INT 4A) | |
| 4B-4F | BIOS | reserved | |
| 50 | BIOS | periodic alarm from timer (PS/2) | |
| 51-58 | BIOS | reserved | |
| 59 | BIOS | GSS Computer Graphics Interface | |
| 5A | BIOS | cluster adapter BIOS entry point | |
| 5B | BIOS | cluster adapter boot | |
| 5C | NETBIOS | NETBIOS interface, TOPS interface | |
| 5D-5F | BIOS | reserved for BIOS | |
| 60-67 | | reserved for user software interrupts | |
| 67 | EMS | LIM/EMS specification (see INT 67) | |
| 68 | | APPC | |
| 69-6B | | reserved by IBM | |
| 6C | DOS | DOS 3.2 real time clock update | |
| | BIOS | system resume vector | |
| 6D-6F | | reserved | |
| 70 | IRQ8 | real time clock (AT,XT286,PS50+, see INT 15) | |
| 71 | IRQ9 | software redirected to IRQ2 (AT,XT286,PS50+) | |
| 72 | IRQ10 | reserved (AT,XT286,PS50+) | |
| 73 | IRQ11 | reserved (AT,XT286,PS50+) | |
| 74 | IRQ12 | mouse interrupt (PS50+) | |
| 75 | IRQ13 | numeric coprocessor NMI error (AT,XT286,PS50+) | |
| 76 | IRQ14 | fixed disk controller (AT,XT286,PS50+) | |
| 77 | IRQ15 | reserved (AT,XT286,PS50+) | |
| 78-79 | | unused | |
| 80-85 | | ROM BASIC | |
| 86-F0 | DOS | reserved for BASIC interpreter use | |
| 86 | NETBIOS | NETBIOS relocated INT 18 | |
| E0 | CPM | CP/M 86 function calls | |
| F1-FF | | reserved by IBM | |
| FE-FF | | may be destroyed by return from protected mode using VDISK on 286 machines (Apr 86, DDJ) | |

- Intel defined 0 through 20h for use for internal CPU; IBM redefined interrupts 0 through 1Fh for its own use, hence the duplicate definitions in the tables
- all interrupts except the internal CPU exceptions push the flags and the CS:IP of the next instruction onto the stack. CPU exception interrupts are similar but push the CS:IP of the causal instruction. 8086/88 divide exceptions are different, they return to the instruction following the division
- interrupts are disabled upon entry into any interrupt routine and should be enabled by the user or by an [IRET](#)
- in DOS 3.2+ hardware IRQ interrupts are re-vectorized through DOS to provide standard stack frames