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Partitioning a hard drive

- Boot up your machine from a floppy disk drive with a copy of DOS and type:

```
DIR C: [ENTER]
```

- If you see the following error message, insert a disk that contains the DOS command FDISK into drive A:

```
Invalid drive specifications
```

Type FDISK [Enter], and view the following screen (assuming you are using MS DOS 6.0):

```
MS-DOS Version 6.00
Fixed Disk Setup Program
(C) Copyright Microsoft Corp. 1993
```

```
FDISK Options
```

```
Current fixed disk drive: 1
```

```
Choose one of the following:
```

1. Create DOS partitions or Logical DOS Drive
2. Set active partition
3. Delete partition or Logical DOS Drive
4. Display partition information

```
Enter Choice: [1]
```

```
Press ESC to exit FDISK
```

- If you choose 1, and the disk has not been prepared, the following screen will come up:

```
Create DOS Partition
```

```
Current Fixed Drive: 1
```

1. Create Primary DOS partition
2. Create Extended DOS partition
3. Create logical DOS drive(s) in the Extended DOS partition

```
Enter choice: [1]
```

```
Press ESC to return to FDISK Options
```

Performing a low-level format on a hard drive

If you have just installed a **new** hard drive, check to see if it was low level formatted at the factory. To check this, type FDISK at the DOS command line. If your PC rejects this command then you must do a low level format.

The low level format can also be done on a drive that has been in use, but has **data** related **problems**, or **viruses**. Be careful though, most low level format programs will create a loss of all data stored on a disk.

If your hard drive needs to be low level formatted, you can use a product such as **CheckIt PRO: Tests & Tools**, which includes a universal low-level formatter.

BE SURE THAT THERE IS NO DATA ON A DRIVE THAT YOU ARE RUNNING THE LOW LEVEL FORMAT ON. LOW LEVEL FORMAT PROGRAMS ARE DATA DESTRUCTIVE. ALL DATA WILL BE LOST.

See also:

Partitioning a hard drive

Installing a card

The steps below describe the installation of a **new card**, such as an internal modem or video adapter.

- Turn your PC and Monitor off.
- **Disconnect** the **power** cord from the back of the PC.
- Unscrew the (usually) 5 screws on the back of the PC and **remove** the **cover**.
- **Locate** an empty **slot** on the motherboard. **Remove** the **bracket** covering the slot. You will use the screw to fasten the new card.
- Refer to any documentation that came with the card for jumper or dip switch settings that need to be set before installation.
- Use the **Setup Advisor** in CheckIt PRO: Analyst to see which settings (such as IRQ and I/O address) can be used for your machine. See **Chapter 7** of your manual for more on the Setup Advisor.
- After setting the appropriate configuration for the card, you are ready to install the card. Push the board into the open **expansion slot**. Make sure the board is seated correctly by pressing down on both ends. The board should sit **level** in the expansion slot.
- In machines where you have both 8 and 16-bit expansion slots, you can add an 8-bit card to either slot. 16-bit cards can only be added to 16-bit slots. Microchannel and EISA bus machines have **32-bit** slots, and their configuration is software driven, as opposed to dip switches or jumpers.
- **Replace** the **screw** you took from the bracket to secure the card.
- Carefully **replace** the **cover** on the machine, and replace the mounting screws. Finally, **re-connect** the **power** cord.
- If the card is not functional after installation, run CheckIt PRO: Analyst again, and **verify** that the **IRQ** and **I/O** settings are correct.

Installing a clock in a PC or XT

If you own a PC or an XT, you may not have a **clock**. You will see this when you boot up your machine are asked for the time and date. CheckIt PRO: Analyst will **verify** whether your system has a clock in the **SysInfo** area under the Config menu. There are two different procedures available to add a clock to your machine:

- Add a **multifunction board** to your machine. These boards will not only have a clock, but also another device such as a parallel port or extended memory.

-or-

- Add a **"no-slot" clock**. These can be installed to 28-pin **ROM sockets**. Most motherboards have an empty ROM socket adjacent to the BIOS chip. If there isn't an available socket, you can remove the BIOS chip, plug in the clock chip, and then plug the BIOS chip into the built-in socket of the clock.

See also:

[Installing a card](#)

Installing a co-processor

If you are using applications that do a great deal of math **calculation** such as **spreadsheets**, then you might find the addition of a co-processor helpful. Co-processors can make the operation of math calculation between 5 and 100 times **faster**.

Following are the basic steps to take when installing a Co-processor on your machine:

- Turn off your PC and Monitor.
- **Remove** the **power** supply cord from the back of the PC.
- **Locate** the **socket** for the Co-processor. It will most likely be next to the CPU. A 387 Co-processor for 80386 machines is square, with 128 pins. Co-processors for 8088, and 80286 machines are rectangular, and have 40 pins.
- **Insert** the **Co-processor** in the socket. There will be an indent in the end of the 8087 and 80287 chips. Match this mark with the one on the motherboard. The 80387 chip is square, and will fit only one way into the socket.
- Put the cover back on the machine and replace the screws. You can run CheckIt PRO: Analyst to **ensure** that your PC is finding the Co-processor and that it is functional.

Installing a floppy drive

The steps below describe the installation of a new floppy drive to your system.

- Turn off your PC and monitor.
- Remove the power supply cord from the back of the PC.
- Prepare the machine for the new floppy by removing the drive port cover. If you have a 3 1/2 inch drive, there will most likely be an expansion bracket included with the drive to mount the drive.
- Refer to the documentation that came with the drive for any jumper settings that need to be assigned for the drive. You can use CheckIt PRO: Analyst to determine what IRQs are available. See Chapter 5 of your manual for information.
- Connect the power and data cables. Check to see if pin 1 is connected to the marked end of the ribbon cable. The power cable should have guides so that it only will go in one way.
- Mount the drive to the chassis.
- Replace the cover and screws. You can use CheckIt PRO: Analyst to ensure the floppy drive has been installed correctly and that it is functional.

Installing a hard drive

Below are the steps to follow when installing a hard drive to your system:

- Turn off your PC and Monitor.
- Remove the power cord from the back of the PC.
- Remove the (usually) 5 screws from the back of the PC and slide off the cover.
- Check the instructions that were shipped with the hard drive and set any jumpers necessary.
- Mount the drive into the drive bay in the PC's case.
- Next, check the controller board instructions for any switches or jumpers that may need to be set.
- Insert the controller board into an empty slot on the motherboard. It is best to choose a slot near the drive itself, so that the cables are not draped over several cards.
- Attach the cables to the drives. There will be two flat ribbon cables, one with 34 wires, and one with 20. One end of the cable will have a different colored wire for pin one. It is possible to connect the ribbon in backwards. To avoid this, look at the disk drive connectors for a space or line between pin 2 and 3. The ribbon side with the different color for pin 1 goes on this side.
- If your controller handles both hard and floppy drives, there will be a 34 wire cable from the floppy drives, and one from the hard disk. The controller instructions will direct you as to which ribbon cable goes where. Check the board for an indication of which pin is pin one. Plug the cable in with the colored end going into pin one.
- Next, plug in the sets of 20 wire cables. The row closest to the hard disk 34 wire cable is for hard disk one. When installing a second drive, the 20 wire cable will plug into the second set of pins.
- Attach the power cables from the hard drive to the PC's power supply. The cables can only be plugged in one way.
- You are now ready to replace the cover and screws to the PC's case.
- If you are running a 80286, 386, or 486, you will need to edit your CMOS table regarding the type of your new hard drive. When you boot up the machine, you will see a key combination to enter the CMOS table edit area. The instructions that came with the drive will tell you which hard drive type to enter.

You can use CheckIt PRO: Analyst to save the CMOS table, and to ensure that the drive is set up properly.

See also:

Performing a low-level format

IRQs and configuration for common devices

Below you will find a chart of common devices and IRQ, I/O and memory assignments. Keep in mind that these are possible assignments only. You should run the **Setup Advisor** in CheckIt PRO: Analyst to verify that these assignments are available on your machine before using them.

DEVICE	COMMON IRQ	I/O DECODE	MEM DECODE
COM1	4	3F8-3FF	---
COM2	3	2F8-2FF	---
LPT1	7	378-37F	---
LPT2	5	278-27F	---
XT DISK CNTRLR	5	320-32F	C8000-CBFFF
AT DISK CNTRLR	14	1F0-1F8	---
VGA	2/9	3C0h-35Ah color	A000-BFFF0
VGA	3	C0h-3BAh mono	C000-C7FFF
EGA	2	3C0-3CF	A0000-AFFFF
MONO	*	3B0-3BF	B0000-B3FFF
CGA	*	3D0-3DF	B8000-BBFFF
HGA	*	3B4-3BF	B0000-B7FFF
AST CLOCK	*	2C0-2C7	---

* NO SPECIFIC IRQ SUGGESTED

Power Supply Capacity Testing

To **avoid exceeding** your PC's power-supply **capacity**, use the following formula to test its usage:

$$\text{Wattage} = \text{Volts} \times \text{Current}$$

The Volts and Current information can be found on the power supply case. Below are the typical wattage ranges for popular components:

Component	Watts
Basic Motherboard	15-25
Expansion or Memory board	10
1 MB of RAM	3-5
Disk Controller board.	3
SCSI Controller board	10-15
Parallel/Serial board	3
Mono or Color video card	6
5.25 inch floppy	5-10
3.5 inch floppy	5
CD ROM Drive	5-20
Sound Card	5
Internal Modem	5

Memory conserving tips

Listed below are several steps you can take to conserve memory on your PC:

- Use a low version of DOS, such as 3.3.
- When using DOS V.5.0, loading DOS=HIGH,UMB in your CONFIG.SYS file, and then loading some TSR programs in upper memory blocks.
- When editing the CONFIG.SYS file, use entries that minimize the amount of RAM used by DOS. In many cases where networks are used, commands such as BUFFERS=, LASTDRIVE= and DEVICE=ANSI.SYS can be avoided or removed.
- Use of memory managers that utilize normally empty RAM areas that exist between the addresses of 640K to 960K. This area is often referred to as HIGH RAM. TSR programs, such as E-Mail, pop-up calculators, and NetWare IPX and NETX fit into this HIGH RAM area.

Protected mode

If your PC has an 80286, 80386, or 80486 processor, CheckIt PRO: Analyst will test your processor's ability to function in protected mode. Under DOS, your CPU is operating under 8086 emulation. This mode is called "Real Mode." When your PC is accessing DOS extended memory or running OS/2 or Xenix, your CPU is running under its native mode called "Protected Mode." So a failure at this stage of the test only indicates a problem under this mode of operation; your PC may work fine under normal DOS operation. Ultimately, it could mean that your PC will not function correctly if you add extended memory or when you run an advanced operating system like OS/2 or Xenix.

The memory test sends an 80286 or 80386 processor into protected mode and back into real mode. In protected mode, the processor can access memory above the 1MB address range. While the processor is in protected mode, interrupts are ignored.

Shadowing

Because ROM (Read Only Memory) is much slower than RAM (Random Access Memory), a way of copying the essential ROM contents to RAM at startup has been devised. This copying from ROM to RAM, called shadowing, can **double** the **speed** of actions usually taken by ROM.

One negative side to shadowing is that it **takes** away **extended memory** space. Some BIOS manufacturers automatically subtract the amount of available extended memory used by shadowing.

To enable shadowing of ROM, run the setup program offered during your system's boot-up. This can be done by pressing the key-combination recommended during boot-up.

Typical memory layout for 80286 and 386 machines

Memory Address		Amount of Memory
FFFFFFh	128 KB Shadow RAM	16Mb
	14.875 MB Extended Memory	
	•	
	•	
	•	
100000h	128 KB System ROMS	1 MB
0E0000h		
0DFFFFh	16 KB Add - in	-----
0DC000h	16 KB Add - in	Available memory
0D8000h	16 KB Add - in	address range for add-in
0D4000h	16 KB Add - in	hardware or 64 KB expan-
0D0000h	16 KB Add - in	ded memory page frame.
0CC000h	16 KB Add - in	
0C8000h	16 KB Add - in	If in doubt, choose ad-
0C4000h	VGA ROM	resses near top of the
0C0000h	EGA or VGA ROM	group.
0C0000h		-----
0BFFFFh	128 KB Video ROM	
0A0000h	64 KB RAM	640 KB Conventional RAM
090000h	64 KB RAM	
080000h	64 KB RAM	512 KB Conventional RAM
070000h	64 KB RAM	
060000h	64 KB RAM	
050000h	64 KB RAM	
040000h	64 KB RAM	256 KB Conventional RAM
030000h	64 KB RAM	
020000h	64 KB RAM	
010000h	64 KB RAM	
000000h	64 KB RAM	

Audible beep error indicators

IBM BIOS

Indicator	Message
One Short Beep	Normal POST system OK
Two Short Beeps	POST error, see screen for error code
No Beeps	Power, Power Supply Loose Card or Short
Continuous Beep	Power, Power Supply Loose Card or Short
Repeating Short Beep	Power, Power Supply Loose Card or Short
One Long and One Short Beep	System Board
One Long and Two Short Beeps	Video (Mono/CGA Display Circuitry)
One Long and Three Short Beeps	Video (EGA) Display Circuitry
Three Long Beeps	Keyboard Card Error
One Beep, Blank or Incorrect Display	Video Display Circuitry

AMI BIOS

Indicator	Message
One Short Beep	DRAM Refresh Failure
Two Short Beeps	Parity Circuit Failure
Three Short Beeps	Base 64k RAM Failure
Four Short Beeps	System Timer Failure
Five Short Beeps	Processor Failure
Six Short Beeps	Keyboard Controller Error
Seven Short Beeps	Virtual Mode Exception Error
Eight Short Beeps	Display Memory Failure
Nine Short Beeps	ROM BIOS Checksum Failure
One Long and Three Short Beeps	Base/Extended Memory Failure
One Long and Eight Short Beeps	Display/Retrace Test Failure

Award BIOS

Indicator	Message
One Long and Two Short Beeps	Video Error
Two Short Beeps	Any Non-Fatal Error
One Short Beep	No Error During POST

Award BIOS 286, 386, and 486

Indicator	Message
One Long and Three Short Beeps	Keyboard Controller Error

Phoenix BIOS

Indicator	Message
One, One & Three Beeps	CMOS Read/Write Failure
One, One & Four Beeps	ROM BIOS Checksum Failure
One, Two & One Beep	Programmable Interval Timer Failure
One, Two & Two Beeps	DMA Initialization Failure
One, Two & Three Beeps	DMA Page Register Read/Write Failure
One, Three & One Beep	RAM Refresh Verification Error
One, Three & Three Beeps	First 64K RAM Chip/Data Line Failure
One, Four & Two Beeps	Parity Failure First 64K RAM
One, Four & Three Beeps	Fail-Safe Timer Feature (EISA Only)
One, Four & Four Beeps	Software NMI Port Failure (EISA Only)

Two, One & One through Two, One & Four; Two, Two & One through Two, Two & Four; Two, Three & One through Two, Three & Four; Two, Four & One through Two, Four & Four	First 64K RAM Chip/Data Line Failure
Three, One & One Beep Three, One & Two Beeps Three, One & Three Beeps Three, One & Four Beeps Three, Two & Four Beeps Three, Three & Four Beeps Three, Four & Two Beeps Four, Two & One Beep Four, Two & Two Beeps Four, Two & Three Beeps Four, Two & Four Beeps Four, Three & One Beep Four, Three & Two Beeps Four, Three & Four Beeps Four, Four & One Beep Four, Four & Two Beeps Four, Four & Three Beeps	Slave DMA Register Test Failure Master DMA Register Test Failure Master Interrupt Mask Register Failure Slave Interrupt Mask Register Failure Keyboard Controller Failure Screen Memory Failure Screen Retrace Failure Timer Tick Failure Shutdown Failure Gate A20 Failure Unexpected Interrupt in Protected Mode RAM Test of Memory Above 64 Failed Programmable Interval Timer, Channel 2 Test Failure Realtime Clock Test Failure Serial Port Test Failure Parallel Port Test Failure Math Co-processor Test Failure

Note: The Phoenix BIOS beep codes are in a different format.
They are three groups of beep counts.

See also:
[System error codes](#)

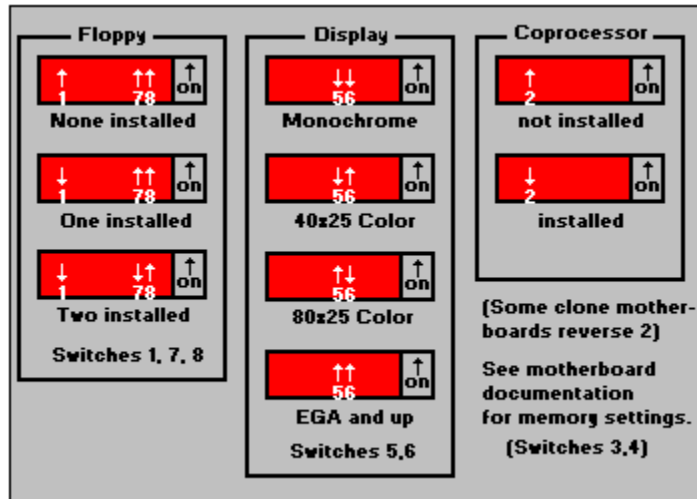
Common floppy disk parameters

Listed below are the common parameters for floppy drives:

DRIVE	360K	1.2Mb	720K	1.44Mb
Tracks/Side	0-39	0-79	0-79	0-79
Sectors/Track	9	15	9	18
Track 0 Length	15 in.	15 in.	10 in.	10 in.
Sector Length	1.66 in.	1 in.	1 in.	.55 in.
Inner Track Length	9.9 in.	9.9 in.	6.5 in.	6.5 in.
Sector Length	1.1 in.	.66 in.	.73 in.	.37 in.
Oerstedse	300	600	600	700
Pack Density BPI	6000	9869	8717	16000

Dip Switch Settings - PC/XT Only

Unlike AT and above models that have CMOS, PC and XT machines have DIP switches. The picture below shows standard switch settings for these machines.



Hexadecimal numbers

Hexadecimal numbers use a **base** of **sixteen**, unlike the decimal system base of ten. The number system is as follows:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F

When counting in the Hexadecimal system, you will not "carry over" to the next place until you pass the F. Hexadecimal numbers are used as a simple way to express binary numbers (0s and 1s). Replacing binary with hexadecimal numbers is convenient because binary numbers use a base of two, and grow in length very quickly.

With each four-digit set of binary numbers, there are **sixteen combinations** possible of 0s and 1s. Therefore, Hexadecimal numbers can be used to provide a clean way to represent four-digit clumps of binary numbers.

Binary	Hex	Decimal	Binary	Hex	Decimal
0000	0	0	1000	8	8
0001	1	1	1001	9	9
0010	2	2	1010	A	10
0011	3	3	1011	B	11
0100	4	4	1100	C	12
0101	5	5	1101	D	13
0110	6	6	1110	E	14
0111	7	7	1111	F	15

Intel microprocessor types

INTEL 8086

The 8086 microprocessor was introduced in 1978, and has a **16-bit** data bus structure. The 8086 was found to be faster than the 8088 in communication speed with the other computer components, but lost out in popularity to the 8088 due to the high cost of 16-bit support chips and peripherals.

INTEL 8088

Also introduced in 1978, the 8088 microprocessor has an **8-bit** external data bus and an 16-bit internal data bus. The original 8088 operated at 4.77 MHz, and has since been expanded to up to 10 MHz. The **10 MHz** speed in "XTs" use chips known as turbo chips.

INTEL 80286

The 80286 microprocessor was introduced in 1984, and included a **16-bit** data structure and the ability to address up to 16 MB of RAM. The 80286 machines run in two distinct modes. Under "Real Mode", the 80286 runs DOS programs at an 8086 pace, and only uses 1MB of RAM. In "Protected Mode", the 80286 uses up to 16MB of RAM.

INTEL 80386

The 80386 microprocessor was introduced in 1986, and included a **32-bit** data bus structure and the ability to address up to 4GB of memory. The 80386 allows memory to be broken up into blocks, allowing applications to be run simultaneously.

INTEL 80386SX

The 80386SX microprocessor was introduced in 1988, and shared the same electronic characteristics as the 80386, except that the SX included a **16-bit** data structure. It therefore could use the add-on chips designed for the 80286, which are much **less expensive**.

INTEL 80486

The 80486 microprocessor was introduced in 1989, and included a **32-bit** data bus structure, and the ability to address up to 64GB of memory.

INTEL Pentium

The Pentium processor is on the leading edge of technology, with a **64-bit** data bus structure.

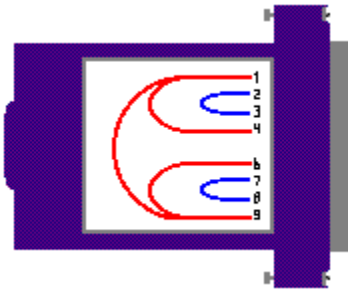
Layers of DOS as PC boots

- ROM Bootstrap program/ROM BIOS
- Network cards, Video, and Expanded memory
- Transient portion of COMMAND.COM
- Transient programs and applications
- Networks Shell and TSRs
- Resident portion of COMMAND.COM
- File Control Blocks
- Disk buffers/cache
- DOS Kernel
- BIOS
- DOS and System parameters
- Interrupt vector table

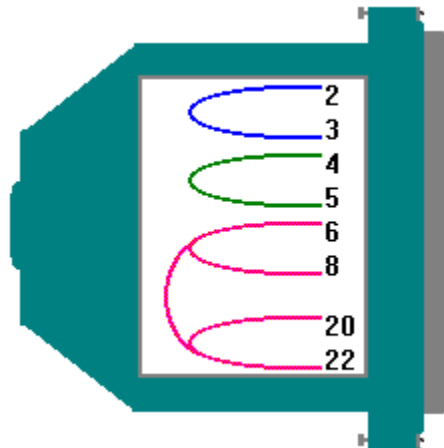
Loopback plugs

When testing ports from DOS, the CheckIt PRO test applets can use three loopback plugs. The parallel loopback plug can also be used when collecting IRQ data for more accurate results. You can use the diagrams below to build your own plugs, or order them directly from TouchStone Software.

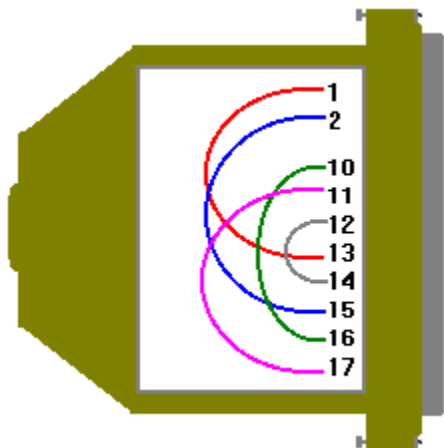
DB-9 Female



DB-25 Female



Parallel Male



Standard DMA channel assignments

Listed below are standard DMA channels for PC compatibles. Note that there are more DMA channels for AT and better machines than for PCs and XTs.

PC and XT compatible machines:

DMA0 Used by system (not available on bus)
DMA1 *
DMA2 Floppy disk controller
DMA3 Hard disk controller

AT compatible machines:

DMA0 Used by system (16 bit)
DMA1 * (8 bit)
DMA2 Floppy disk controller (8 bit)
DMA3 * (8 bit)
DMA4 [CASCADE] - Slave DMA controller input into master
DMA5 * (16 bit)
DMA6 * (16 bit)
DMA7 * (16 bit)

* = No standard DMA assignment; you can assign these DMA channels to devices not listed that can be configured for DMA.

System error codes

Listed below are **standard** system error codes which are reported during boot-up when there is a problem:

Codes	Problem Area
02x	Power Supply Problem
100	Option configuration wrong
101	System Board Interrupt Circuitry
102	System Board Timer Circuitry
103	System Board Timer Interrupt
104	System Board Protected Mode
105	System Board last 8042 command
106	System Board Converting Logic Test
107	System Board NMI Test
108	System Board System Timer Bus Test
109	DMA Test Error
121	Unexpected Hardware Interrupt
131	Cassette Port Error
161	System Option Failure(Low Battery?) Run Setup
162	System Options Incorrect Run Setup
163	Time and Date Not Set Run Setup
164	Memory Size Setting Incorrect
991	Run Setup
199 100	Software Option Config Error Check Switches
2xx	RAM Memory Error
201	Memory Test Failure
xxxx=201	Memory Failure
1055=201	DIP Switches Incorrect
2055=201	DIP Switches Incorrect
xxxx=201	Parity Check X RAM Chip Malfunction
202	Memory Address Error
203	Memory Address Error
301	Keyboard Errors
3xx	Keyboard Malfunction (Check Cable/Keyboard; no response to reset)
xx301	Keyboard Circuitry (stuck Key)
49 301	Key 73 Bad (49H=73 decimal)
302	User Indicated error From Keyboard Test , or AT keyboard is Locked
303	Keyboard or System Unit Failure
304	Keyboard or System Unit Error; CMOS RAM Configuration doesn't match
4xx	Monochrome Adapter Card Error
401	Monochrome Memory, Horizontal Sync Frequency, or Video Test Failed
408	User Indicated Display Attribute Failure
416	User Indicated Character Set Failure
424	User Indicated 80 by 25 Failure
432	Parallel Port Test Failure (Monochrome Adapter Card)
5xx	Color Graphics Card Adapter Failure
501	Color Memory Test, Horizontal Sync Frequency, or Video Test failure
508	User Indicated Display Attribute Failure
516	User Indicated Character set Failure
524	80 by 25 Mode Failure
532	40 by 25 Mode Failure
540	320 by 200 Graphics Mode Failure
548	640 by 200 Graphics Mode Failure
6xx	Diskette Drives Failure
601	Diskette Power on Diagnostics Test Failure (Interface Malfunction)
602	Diskette Test Failure
606	Disk Verify Function Failure
607	Diskette is Write Protected, Disk not Inserted Properly, or Controller Fail
608	Diskette Bad
610	Diskette Initialization Failure
611	Diskette Controller, Drive, or Data Cable (Timeout Failure)
612	Diskette Controller or Data Cable
613	Diskette Controller or Data Cable (DMA Failure Indicated)
621	Drive Assembly Seek Failure
622	Drive Assembly CRC Failure
623	Drive Assembly; Record not Found
624	Drive Assembly; Bad Address Mark

625	Drive Assembly; Bad FDC Seek
626	Drive Assembly; Data Compare Error
7xx	Coprocessor Error
9xx	Parallel Printer Adapter Error
901	Parallel Printer Adapter Error (Could Be The Printer)
10xx	Reserved For Parallel Printer Adapter
11xx	Async. Comm. Port Adapter Error
1101	Async. Comm. Port Adapter Test Fail
12xx	Alternate Async. Comm. Ports Adapter Errors
1201	Alternate Async. Comm. Ports Adapter Test Failure
13xx	Game Control Adapter Controller
1301	Game Control Adapter Controller Test Failure
1302	Joystick Test Failure
14xx	Printer Interface Error
1401	Printer Test Failure
1404	Matrix Printer Failure
15xx	Synchronous Data-Link Control Comm. Adapter
1510	8255 Port B Failure
1511	8255 Port A Failure
1512	8255 Port C Failure
1513	8253 Timer 1 did not Reach Terminal Count
1514	8253 Timer 1 Stuck
1515	8253 Timer 0 did not Reach Terminal Count
1516	8253 Timer 0 Stuck
1517	8253 Timer 2 did not Reach Terminal Count
1518	8253 Timer 2 Stuck
1519	8273 Port B Error
1520	8273 Port A Error
1521	8273 Command/Read Timeout
1522	Interrupt Level 4 Error
1523	Ring Indicate Stuck
1524	Receive Clock Stuck
1525	Transmit Clock Stuck
1526	Test Indicate Stuck
1527	Ring Indicate not on
1528	Receive Clock not on
1529	Transmit Clock not on
1530	Test Indicate not on
1531	Data Set Ready not on
1532	Carrier Detect not on
1533	Clear to Send not on
1534	Data Set Ready Stuck
1536	Clear to Send Stuck
1537	Level 3 Interrupt Failure
1538	Receive Interrupt Results Error
1539	Wrap Data Did not Compare
1540	DMA Channel 1 Error
1541	DMA Channel 1 Error
1542	8273 Error Checking or Status Reporting Failure
1547	Stray Interrupt Level 4
1548	Stray Interrupt Level 3
1549	Interrupt Presentation Sequence Timeout
16xx	Display Emulation Error (327X, 5520, 525X)
17xx	Fixed Disk Drive Errors
1701	Fixed Disk Post Error
1702	Fixed Disk Drive Controller Error
1703	Fixed Disk Drive Error
1704	Fixed Disk or Controller Error
1780	Fixed Disk 0 Error
1781	Fixed Disk 1 Error
1782	Fixed Disk Controller Failure
1790	Fixed Disk 0 Error
1791	Fixed Disk 1 Error
18xx	I/O Expansion Unit or Cable to Expansion Unit Errors
1801	I/O Expansion unit Post Errors
1810	Enable/Disable Failure
1811	Extender Card Wrap Test Failed (Disabled)
1812	High-Order Address Lines Failure (Disabled)
1813	Wait-State Failure(Disabled)
1814	Enable/Disable Could not be Set

1815	Wait-State Failure(Enabled)
1816	Extender Card Wrap Test Failed (Enabled)
1817	High-Order Address Lines Failure (Enabled)
1818	Disable not Functioning
1819	Wait Request Switch not Set Correctly
1820	Receiver Card Wrap Test Failure, Expansion Unit Cable Failure
1821	Receiver High-Order Address Lines Failure
19xx	3270 PC Attachment Card Error
20xx	Binary Synchronous Comm. Adapter Error
2010	8255 Port A Failure
2011	8255 Port B Failure
2012	8255 Port C Failure
2013	8253 Timer 1 did not Reach Terminal Count
2014	8253 Timer 1 stuck on
2016	8253 Timer 2 did not Reach Terminal Count, or Timer 2 Stuck on
2017	Data Set Ready Failed to Come on
2018	8251 Clear to Send not Sensed
2019	8251 Data Set Ready Stuck on
2020	8251 Clear To Send Stuck on
2021	8251 Hardware Reset Failed
2022	8251 Software Reset Failed
2023	8251 Software "Error Reset" Failed
2024	8251 Transmit Ready did not come on
2025	8251 Receive Ready did not come on
2026	8251 Could not Force "overrun" errors Status
2027	Interrupt Failure(no timer Interrupt)
2028	Interrupt Failure(Transmit, Replace Card or Plannar
2029	Interrupt Failure Transmit Replace Card
2030	Interrupt Failure (Receive, Replace Card or Plannar)
2031	Interrupt Failure (Receive Replace Card)
2033	Ring Indicate Stuck on
2034	Receive Clock Stuck on
2035	Transmit Clock Stuck on
2036	Test Indicate Stuck on
2037	Ring Indicate not on
2038	Receive Clock not on
2039	Transmit Clock not on
2040	Test Indicate not on
2041	Data Set Ready not on
2042	Carrier Detect not on
2043	Clear To Send not on
2044	Data Set Ready Stuck on
2045	Carrier Detect Stuck on
2046	Clear To Send Stuck on
2047	Unexpected Transmit Interrupt
2048	Unexpected Receive Interrupt
2049	Transmit Data did not Equal Receive Data
2050	8251 Detected Overrun Error
2051	Lost Data Set Ready During Data Wrap
2052	Receive Timeout During Data Wrap
21xx	Alternate Binary Synchronous Comm. Adapter Error
2110	8255 Port A Failure
2111	8255 Port B Failure
2112	8255 Port C Failure
2113	8253 Timer 1 did not Reach Terminal Count
2114	8253 Timer 1 Stuck On
2115	8253 Timer 2 did not Reach Terminal Count or Timer 2 Stuck on
2116	Data Set Ready Failed to Come On
2117	8251 Clear To Send not Sensed
2118	8251 Data Set Ready Stuck on
2119	8251 Clear To Send Stuck on
2120	8251 Hardware Reset Failed
2121	8251 Software Reset Failed
2122	8251 Software "Error Reset" Failed
2123	8251 Transmit Ready did not come on
2124	8251 Receive Ready did not come on
2125	8251 Could not Force "Overrun" Error Status
2126	Interrupt Failure- No Timer Interrupt
2128	Interrupt Failure- Transmit, Replace Card or plannar
2129	Interrupt Failure- Transmit Replace Card

2130	Interrupt Failure- Receive, Replace Card or Plannar
2131	Interrupt Failure- Receive Replace Card
2133	Ring Indicate Stuck on
2134	Receive Clock Stuck on
2135	Transmit Clock Stuck on
2136	Test Indicate Stuck on
2137	Ring Indicate not on
2138	Receive Clock not on
2139	Transmit Clock not on
2140	Test Indicate not on
2141	Data Set Ready not on
2142	Carrier Detect not on
2143	Clear To Send not on
2144	Data Set Ready Stuck on
2145	Carrier Detect Stuck on
2146	Clear To Send Stuck on
2147	Unexpected Transmit Interrupt
2148	Unexpected Receive Interrupt
2149	Transmit Data did not Equal Receive data
2150	8251 Detected Overrun Error
2151	Lost Data Set Ready during data wrap
2152	Receive Timeout During Data Wrap
22xx	Cluster Adapter Errors
24xx	Enhanced Graphics Adapter Errors
29xx	Color Matrix Printer Errors
30xx	Primary PC Network Adapter Error
3001	CPU Failure
3002	ROM Failure
3003	ID Failure
3004	RAM Failure
3005	HIC Failure
3006	(+,-) 12v Failure
3007	Digital Loopback Failure
3008	Host Detected HIC Failure
3009	Sync Failure And No-Go Bit
3010	HIC Test OK and No-Go Bit
3011	Go Bit and no CMD 41
3012	Card not Present
3013	Digital Failure(Fall Through)
3015	Analog Failure
3041	Hot Carrier(not this Card)
3042	Hot Carrier(This Card)
31xx	Secondary Network Adapter Error
3101	CPU Failure
3102	ROM Failure
3103	ID Failure
3104	RAM Failure
3105	HIC Failure
3106	(+,-) 12v Failure
3107	Digital Loopback Failure
3108	Host Detected HIC Failure
3109	Sync Failure and No-Go Bit
3110	HIC Test OK and No-Go Bit
3111	Go Bit and no CMD 41
3112	Card Not Present
3113	Digital Failure(Fall Through)
3115	Analog Failure
3141	Hot Carrier(Not This Card)
3142	Hot Carrier(This Card)
33xx	Compact Printer Errors

See also:

[Audible beep error codes](#)

Video mode details

Listed below are the **standard** video modes for IBM PC and compatibles:

Mode	Type	Colors	Resolution	Adapter
0	Text	16	40x25 chars (320x200 pixels)	CGA, EGA, VGA, Mono
0	Text	16	40x25 chars (320x350 pixels)	EGA, VGA
0	Text	16	40x25 chars (320x400 pixels)	MCGA
0	Text	16	40x25 chars (360x400 pixels)	VGA
1	Text	16	40x25 chars (320x200 pixels)	CGA, EGA, MCGA, VGA
1	Text	16	40x25 chars (320x350 pixels)	EGA, VGA
1	Text	16	40x25 chars (320x400 pixels)	MCGA
1	Text	16	40x25 chars (360x400 pixels)	VGA
2	Text	16	80x25 chars (640x200 pixels)	CGA, EGA, MCGA, VGA
2	Text	6	80x25 chars (640x350 pixels)	EGA, VGA
2	Text	6	80x25 chars (640x400 pixels)	MCGA
2	Text	6	80x25 chars (720x400 pixels)	VGA
3	Text	6	80x25 chars (640x200 pixels)	CGA, EGA, MCGA, VGA
3	Text	16	80x25 chars (640x350 pixels)	EGA, VGA
3	Text	16	80x25 chars (640x400 pixels)	MCGA
3	Text	16	80x25 chars (720x400 pixels)	VGA
4	Graphics	4	320x200 pixels	CGA, EGA, MCGA, VGA
5	Graphics	4	320x200 pixels	CGA, EGA*
6	Graphics	2	640x200 pixels	CGA, EGA, MCGA, VGA
7	Text	2	80x25 chars (720x350 pixels)	MDA, EGA, VGA
7	Text	2	80x25 chars (720x400 pixels)	VGA
0D	Graphics	16	320x200 pixels	EGA, VGA
0E	Graphics	16	640x200 pixels	EGA, VGA
0F	Graphics	2	640x350 pixels	EGA, VGA

* on EGA, MCGA, and VGA. CGA MCGA has a different palette. VGA

Video mode types

MDA -- Monochrome Display Adapter

This video card can display **only text** mode characters and only in **one color**. This standard supports only monochrome mode 7 (720x350 pixel resolution).

HGA -- Hercules Graphics Adapter

This is an extension of the MDA standard. It adds monochrome **graphics resolution** (720x348) capability to a board that fully supports the MDA standard. Because of its popularity, it has become a de-facto standard for monochrome graphics.

CGA -- Color Graphics Adapter

This video card can display **text** in any of **16 colors**, and **graphics** in any of **4 colors**. This standard supports video modes 4 and 5 (320x200 4-color graphics) and mode 6 (640x200 2-color graphics).

EGA -- Enhanced Graphics Adapter.

This video card can display **text** and **graphics** in any **16 colors** from a palette of 64. It also supports a higher resolution than CGA video cards. In addition, it has the unique ability to support either MDA, CGA, or EGA monitors.

MCGA -- Multi-Color Graphics Array

This video card is a cross between a CGA and a VGA. Specifically, it supports all CGA modes and can display **graphics** in up to **256** simultaneous colors. This type of adapter is built-in on all IBM PS/2 Model 25 and Model 30 computers, but it has gained little popularity elsewhere in favor of VGA.

VGA -- Video Graphics Array

This video card can display **text** and **graphics** in any of **256** colors from a palette of 262,144. It also supports a higher resolution than CGA, EGA, or MCGA video cards. This type of adapter is built-in on all mid-to high-range IBM PS/2 Model computers, and most compatibles. It is now the leading standard.

SVGA -- Super VGA.

These cards are VGA-compatible but offer vendor-specific enhancements, such as **higher resolution** and **enhanced text modes**.

VESA -- Video Electronic Standard Association

This standard provides a generic way to go **beyond VGA**. It provides an interface layer on top of another video card already installed. The other card must be at least VGA. Most SVGA cards have drivers for VESA.

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Graphics by The Dougster

FDISK is a program that is shipped with MS DOS that **configures** a **hard drive** for use with DOS.

Partitions are **divisions** of a hard disk that store data. A large drive may be divided up into several partitions (e.g. C:, D: and E:).

A **jumper** is an electronic connection that **allows adjustments** to be made to a card or motherboard to change configuration. Jumpers can be **added, removed, or moved**. Documentation for specific devices and motherboards will tell you how to use the jumpers to change the settings.

An **Interrupt ReQuest** is an assigned value which controls **instructions** for hardware and software. Each device requires its own IRQ, or conflicts will occur. The CPU uses these IRQs to determine which devices are **calling** for **input** or **output**. The IRQ Analysis function in CheckIt PRO: Analyst will display which IRQs are being loaded for the machine from where data was collected.

Described in **hexadecimal** format, I/O **assignments** describe the channels in memory by which devices and memory communicate. Each device will have its own **unique** I/O address. The I/O Address Map in CheckIt PRO: Analyst will show you the I/O assignments for the machine from which data was collected.

The **Microchannel** architecture uses **32-bit access**. It can be found in higher-end PS/2 machines. This bus architecture is not down-wardly compatible with the ISA bus.

The **Enhanced Industry Standard Architecture** bus is an **alternative** to the Microchannel but in that it can use 32-bit cards, and ISA boards simultaneously.

Terminate and **Stay Resident** programs are loaded into memory, and "called up" when you hit a hot key combination (e.g. Ctrl + E to load an E-mail program). These programs take up memory, even when you aren't using them. You can use the **TSR List** in CheckIt PRO: Analyst to see which TSRs are loaded on the machine from which you collected data.

Direct Memory Address assignments allow devices to communicate directly with memory, **bypassing** the **CPU**. This allows for much **faster** access times.

