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Computer POST / beep codes

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POST ABCs

The computer POST (*Power On Self Test)* tests the computer, insuring that it meets the necessary system requirements and that all hardware is working properly before starting the remainder of the boot process. If the computer passes the POST the computer will have a single beep (*with some computer BIOS manufacturers it may beep twice*) as the computer starts and the computer will continue to start normally. However, if the computer fails the POST, the computer will either not beep at all or will generate a beep code, which tells the user the source of the problem.

The steps of a POST

Each time the computer boots up the computer must past the POST. Below is the common steps a POST performs each time your computer starts.

1. Test the power supply to ensure that it is turned on and that it releases its reset signal.
2. CPU must exit the reset status mode and thereafter be able to execute instructions.
3. BIOS checksum must be valid, meaning that it must be readable.
4. CMOS checksum must be valid, meaning that it must be readable.
5. CPU must be able to read all forms of memory such as the memory

controller, memory bus, and memory module.
6. The first 64KB of memory must be operational and have the capability to be read and written to and from, and capable of containing the POST code.
7. I/O bus / controller must be accessible.
8. I/O bus must be able to write / read from the video subsystem and be able to read all video RAM.

If the computer does not pass any of the above tests, your computer will receive an irregular POST. An irregular POST is a beep code that is different from the standard one or two beeps. This could be either no beeps at all or a combination of different beeps indicating what is causing the computer not to past the POST.

If you're receiving an irregular POST **document CH000607** on www.compuerhope.com contains all the steps a user can do to resolve the issue or help determine what hardware has failed in the computer so it can be replaced. If you're getting a beep code the remainder of this page contains a listing of each of the major manufacturers beep codes and what they each mean.

AMI BIOS beep codes

Below are the AMI BIOS Beep codes that can occur. However, because of the wide variety of different computer manufacturers with this BIOS, the beep codes may vary.

Documents below will transfer you to www.computerhope.com the authors of this article

Beep Code	Descriptions	Document
1 short	DRAM refresh failure	CH000996
2 short	Parity circuit failure	CH000607
3 short	Base 64K RAM failure	CH000996
4 short	System timer failure	CH000607
5 short	Process failure	CH000607
6 short	Keyboard controller Gate A20 error	CH000383
7 short	Virtual mode exception error	CH000607
8 short	Display memory Read/Write test failure	CH000607
9 short	ROM BIOS checksum failure	CH000607
10 short	CMOS shutdown Read/Write error	CH000239
11 short	Cache Memory error	CH000607

1 long, 3 short	Conventional/Extended memory failure	CH000996
1 long, 8 short	Display/Retrace test failed	CH000607

AWARD BIOS beep codes

Below are Award BIOS Beep codes that can occur. However, because of the wide variety of different computer manufacturers with this BIOS, the beep codes may vary.

Beep Code	Description	Document
1 long, 2 short	Indicates a video error has occurred and the BIOS cannot initialize the video screen to display any additional information	CH000607
Any other beep(s)	RAM problem.	CH000996

If any other correctable hardware issues, the BIOS will display a message.

IBM BIOS beep codes

Below are IBM BIOS Beep codes that can occur. However, because of the wide variety of models shipping with this BIOS, the beep codes may vary.

Beep Code	Description	Document
No Beeps	No Power, Loose Card, or Short.	CH000312
1 Short Beep	Normal POST, computer is ok.	No problem
2 Short Beep	POST error, review screen for error code.	See screen
Continuous Beep	No Power, Loose Card, or Short.	CH000607
Repeating Short Beep	No Power, Loose Card, or Short.	CH000607
One Long and one Short Beep	Motherboard issue.	CH000607
One Long and Two Short Beeps	Video (Mono/CGA Display Circuitry) issue.	CH000607
One Long and Three Short Beeps.	Video (EGA) Display Circuitry.	CH000607
Three Long Beeps	Keyboard / Keyboard card error.	CH000304

One Beep, Blank or Incorrect Display	Video Display Circuitry.	CH000607

Macintosh startup tones

Tones	Error
Error Tone. (two sets of different tones)	Problem with logic board or SCSI bus.
Startup tone, drive spins, no video	Problem with video controller.
Powers on, no tone.	Logic board problem.
High Tone, four higher tones.	Problem with SIMM.

Phoenix BIOS beep codes

Below are the beep codes for PHOENIX BIOS Q3.07 OR 4.X

Beep Code	Description / What to Check
1-1-1-3	Verify Real Mode.
1-1-2-1	Get CPU type.
1-1-2-3	Initialize system hardware.
1-1-3-1	Initialize chipset registers with initial POST values.
1-1-3-2	Set in POST flag.
1-1-3-3	Initialize CPU registers.
1-1-4-1	Initialize cache to initial POST values.
1-1-4-3	Initialize I/O.
1-2-1-1	Initialize Power Management.
1-2-1-2	Load alternate registers with initial POST values.
1-2-1-3	Jump to UserPatch0.
1-2-2-1	Initialize keyboard controller.
1-2-2-3	BIOS ROM checksum.
1-2-3-1	8254 timer initialization.
1-2-3-3	8237 DMA controller initialization.
1-2-4-1	Reset Programmable Interrupt Controller.

1-3-1-1	Test DRAM refresh.
1-3-1-3	Test 8742 Keyboard Controller.
1-3-2-1	Set ES segment to register to 4 GB.
1-3-3-1	28 Autosize DRAM.
1-3-3-3	Clear 512K base RAM.
1-3-4-1	Test 512 base address lines.
1-3-4-3	Test 512K base memory.
1-4-1-3	Test CPU bus-clock frequency.
1-4-2-4	Reinitialize the chipset.
1-4-3-1	Shadow system BIOS ROM.
1-4-3-2	Reinitialize the cache.
1-4-3-3	Autosize cache.
1-4-4-1	Configure advanced chipset registers.
1-4-4-2	Load alternate registers with CMOS values.
2-1-1-1	Set Initial CPU speed.
2-1-1-3	Initialize interrupt vectors.
2-1-2-1	Initialize BIOS interrupts.
2-1-2-3	Check ROM copyright notice.
2-1-2-4	Initialize manager for PCI Options ROMs.
2-1-3-1	Check video configuration against CMOS.
2-1-3-2	Initialize PCI bus and devices.
2-1-3-3	Initialize all video adapters in system.
2-1-4-1	Shadow video BIOS ROM.
2-1-4-3	Display copyright notice.
2-2-1-1	Display CPU type and speed.
2-2-1-3	Test keyboard.
2-2-2-1	Set key click if enabled.
2-2-2-3	56 Enable keyboard.
2-2-3-1	Test for unexpected interrupts.

2-2-3-3	Display prompt "Press F2 to enter SETUP".
2-2-4-1	Test RAM between 512 and 640k.
2-3-1-1	Test expanded memory.
2-3-1-3	Test extended memory address lines.
2-3-2-1	Jump to UserPatch1.
2-3-2-3	Configure advanced cache registers.
2-3-3-1	Enable external and CPU caches.
2-3-3-3	Display external cache size.
2-3-4-1	Display shadow message.
2-3-4-3	Display non-disposable segments.
2-4-1-1	Display error messages.
2-4-1-3	Check for configuration errors.
2-4-2-1	Test real-time clock.
2-4-2-3	Check for keyboard errors
2-4-4-1	Set up hardware interrupts vectors.
2-4-4-3	Test coprocessor if present.
3-1-1-1	Disable onboard I/O ports.
3-1-1-3	Detect and install external RS232 ports.
3-1-2-1	Detect and install external parallel ports.
3-1-2-3	Re-initialize onboard I/O ports.
3-1-3-1	Initialize BIOS Data Area.
3-1-3-3	Initialize Extended BIOS Data Area.
3-1-4-1	Initialize floppy controller.
3-2-1-1	Initialize hard-disk controller.
3-2-1-2	Initialize local-bus hard-disk controller.
3-2-1-3	Jump to UserPatch2.
3-2-2-1	Disable A20 address line.
3-2-2-3	Clear huge ES segment register.
3-2-3-1	Search for option ROMs.

3-2-3-3	Shadow option ROMs.
3-2-4-1	Set up Power Management.
3-2-4-3	Enable hardware interrupts.
3-3-1-1	Set time of day.
3-3-1-3	Check key lock.
3-3-3-1	Erase F2 prompt.
3-3-3-3	Scan for F2 key stroke.
3-3-4-1	Enter SETUP.
3-3-4-3	Clear in-POST flag.
3-4-1-1	Check for errors
3-4-1-3	POST done--prepare to boot operating system.
3-4-2-1	One beep.
3-4-2-3	Check password (optional).
3-4-3-1	Clear global descriptor table.
3-4-4-1	Clear parity checkers.
3-4-4-3	Clear screen (optional).
3-4-4-4	Check virus and backup reminders.
4-1-1-1	Try to boot with INT 19.
4-2-1-1	Interrupt handler error.
4-2-1-3	Unknown interrupt error.
4-2-2-1	Pending interrupt error.
4-2-2-3	Initialize option ROM error.
4-2-3-1	Shutdown error.
4-2-3-3	Extended Block Move.
4-2-4-1	Shutdown 10 error.
4-3-1-3	Initialize the chipset.
4-3-1-4	Initialize refresh counter.
4-3-2-1	Check for Forced Flash.
4-3-2-2	Check HW status of ROM.

4-3-2-3	BIOS ROM is OK.
4-3-2-4	Do a complete RAM test.
4-3-3-1	Do OEM initialization.
4-3-3-2	Initialize interrupt controller.
4-3-3-3	Read in bootstrap code.
4-3-3-4	Initialize all vectors.
4-3-4-1	Boot the Flash program.
4-3-4-2	Initialize the boot device.
4-3-4-3	Boot code was read OK.