## AMIBIOS Beep Codes

Before video is active, AMIBIOS communicates errors with beep codes.

### Table A-1 AMIBIOS beep codes

| Beeps | Description | Things to Try and Do |
|---|---|---|
| 1 beep | Refresh failure | • Reseat the memory modules<br>• Replace modules |
| 2 beeps | Parity error | Same as for 1 beep |
| 3 beeps | Base 64K memory failure | Same as for 1 beep |
| 4 beeps | Timer not operational | System board must be sent in for repair |
| 5 beeps | Processor error | Same as for 4 beeps |
| 6 beeps | 8042 – gate A20 failure | • Replace the keyboard<br>• Reseat the keyboard controller chip<br>• Replace the keyboard controller chip |
| 7 beeps | Processor exception interrupt error | Same as for 4 beeps |
| 8 beeps | Display memory read/write failure | • Replace the memory on the video card<br>• Replace the video card |
| 9 beeps | ROM checksum error | Replace the BIOS chip |
| 10 beeps | CMOS shutdown register read/write | Same as for 4 beeps |

| | | |
|---|---|---|
| | error | |
| 11 beeps | Cache memory bad | • Reseat cache memory<br>• Replace cache memory |

## Award BIOS Error Messages

Award BIOS does not use beep codes to communicate errors unless the error has to do with the video subsystem. After video is working, errors are communicated as POST codes that can be read by a POST diagnostic card and as error messages displayed on the screen. Table A-2 is a list of error messages, what they mean, and what to do about them.

**GoTo** For more information about POST diagnostic cards, see Appendix H, *Where to Go for More Help: Other Resources* (page H-2). For a list of POST codes and their meanings, see the Phoenix Web site at this URL (Award BIOS is now owned by Phoenix): *http://www.phoenix.com /pcuser /bios - award - postcode.pdf*

The following is a list of error messages that Award BIOS might display during POST.

**Table A-2 Award BIOS error messages**

| Error Message | Description | Things to Do |
|---|---|---|
| One long, two short beeps | There is a problem with video | • Reseat the video card<br>• Replace the video card |
| BIOS ROM checksum error – system halted | BIOS code is corrupted | Replace the BIOS chip |
| CMOS battery failed | Bad CMOS battery | Replace the battery |
| CMOS checksum error – defaults loaded | CMOS may be corrupted or battery may be weak | Replace the battery |

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|---|---|---|
| CPU at nnnn | The running speed of CPU is displayed | This is not an error |
| Display switch is set incorrectly | A switch on the system board that can be set to color or monochrome is set differently than setup | Either change the switch or change setup so they agree |
| Press ESC to skip memory test | User option | This is not an error |
| Floppy disk fail | BIOS can't find or initialize the floppy disk | • Install a floppy disk drive change setup so none is expected<br>• Troubleshoot the floppy drive |
| Hard disk initializing… | For information only | This is not an error |
| Hard disk install failure | BIOS can't find or initialize the hard disk drive controller | • Install a hard disk drive or change setup so none is expected<br>• Troubleshoot the hard disk drive subsystem |
| Keyboard error or no keyboard present | BIOS can't find the keyboard | • Check keyboard connection<br>• Check that no keys are pressed |
| Keyboard is locked out – unlock the key | One or more keys are pressed | • Check that nothing is resting on the keyboard |
| Memory test | Memory is being counted | This is not an error |
| Memory test failed | Memory error–more information may follow | • Reseat memory modules<br>• Replace modules |
| Override enabled – defaults loaded | BIOS was unable to boot with current CMOS settings so | • Check previous CMOS setup for errors |

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|---|---|---|
| | default settings were loaded | |
| Press TAB to show POST screen | System board OEM may replace Award BIOS screen with its own | • Press TAB to show original Award BIOS screen |
| Primary master hard drive fail, Primary slave hard drive fail, Secondary master hard drive fail, Secondary slave hard drive fail | POST detected a hard disk drive failure | • Troubleshoot the IDE hard disk drive subsystem |

## Phoenix BIOS

Phoenix BIOS communicates problems during POST and error conditions with beep codes and POST codes that can be read by diagnostic cards.

### Table A-3 POST/beep codes for Phoenix BIOS 4.x

| Beep Code | POST Code | Description |
|---|---|---|
| 1-1-1-3 | 02 | Verify real mode |
| 1-1-2-1 | 04 | Get CPU type |
| 1-1-2-3 | 06 | Initialize system hardware |
| 1-1-3-1 | 08 | Initialize chipset registers with initial POST values |
| 1-1-3-2 | 09 | Set in POST flag |
| 1-1-3-3 | 0A | Initialize CPU registers |
| 1-1-4-1 | 0C | Initialize cache to initial POST values |

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|---|---|---|
| 1-1-4-3 | 0E | Initialize I/O |
| 1-2-1-1 | 10 | Initialize power management |
| 1-2-1-2 | 11 | Load alternate registers with initial POST values |
| 1-2-1-3 | 12 | Jump to UserPatch0 |
| 1-2-2-1 | 14 | Initialize keyboard controller |
| 1-2-2-3 | 16 | BIOS ROM checksum |
| 1-2-3-1 | 18 | 8254 timer initialization |
| 1-2-3-3 | 1A | 8237 DMA controller initialization |
| 1-2-4-1 | 1C | Reset programmable interrupt controller |
| 1-3-1-1 | 20 | Test DRAM refresh |
| 1-3-1-3 | 22 | Test 8742 keyboard controller |
| 1-3-2-1 | 24 | Set ES segment to register to 4GB |
| 1-3-3-1 | 28 | Autosize DRAM |
| 1-3-3-3 | 2A | Clear 512K base RAM |
| 1-3-4-1 | 2C | Test 512 base address lines |
| 1-3-4-3 | 2E | Test 512K base memory |
| 1-4-1-3 | 32 | Test CPU bus-clock frequency |
| 1-4-2-1 | 34 | CMOS RAM read/write failure (this code commonly indicates a problem on the ISA bus such as a card not seated correctly) |
| 1-4-2-4 | 37 | Reinitialize the chipset |
| 1-4-3-1 | 38 | Shadow system BIOS ROM |
| 1-4-3-2 | 39 | Reinitialize the cache |

| | | |
|---|---|---|
| 1-4-3-3 | 3A | Autosize cache |
| 1-4-4-1 | 3C | Configure advanced chipset registers |
| 1-4-4-2 | 3D | Load alternate registers with CMOS values |
| 2-1-1-1 | 40 | Set initial CPU speed |
| 2-1-1-3 | 42 | Initialize interrupt vectors |
| 2-1-2-1 | 44 | Initialize BIOS interrupts |
| 2-1-2-3 | 46 | Check ROM copyright notice |
| 2-1-2-4 | 47 | Initialize manager for PCI options ROMs |
| 2-1-3-1 | 48 | Check video configuration against CMOS |
| 2-1-3-2 | 49 | Initialize PCI bus and devices |
| 2-1-3-3 | 4A | Initialize all video adapters in system |
| 2-1-4-1 | 4C | Shadow video BIOS ROM |
| 2-1-4-3 | 4E | Display copyright notice |
| 2-2-1-1 | 50 | Display CPU type and speed |
| 2-2-1-3 | 52 | Test keyboard |
| 2-2-2-1 | 54 | Set key click if enabled |
| 2-2-2-3 | 56 | Enable keyboard |
| 2-2-3-1 | 58 | Test for unexpected interrupts |
| 2-2-3-3 | 5A | Display prompt “Press F2 to enter SETUP” |
| 2-2-4-1 | 5C | Test RAM between 512K and 640K |
| 2-3-1-1 | 60 | Test expanded memory |
| 2-3-1-3 | 62 | Test extended memory address lines |

| | | |
|---|---|---|
| 2-3-2-1 | 64 | Jump to UserPatch1 |
| 2-3-2-3 | 66 | Configure advanced cache registers |
| 2-3-3-1 | 68 | Enable external and CPU caches |
| 2-3-3-2 | 69 | Initialize SMI handler |
| 2-3-3-3 | 6A | Display external cache size |
| 2-3-4-1 | 6C | Display shadow message |
| 2-3-4-3 | 6E | Display nondisposable segments |
| 2-4-1-1 | 70 | Display error messages |
| 2-4-1-3 | 72 | Check for configuration errors |
| 2-4-2-1 | 74 | Test real-time clock |
| 2-4-2-3 | 76 | Check for keyboard errors |
| 2-4-4-1 | 7C | Set up hardware interrupts vectors |
| 2-4-4-3 | 7E | Test coprocessor if present |
| 3-1-1-1 | 80 | Disable onboard I/O ports |
| 3-1-1-3 | 82 | Detect and install external RS232 ports |
| 3-1-2-1 | 84 | Detect and install external parallel ports |
| 3-1-2-3 | 86 | Reinitialize onboard I/O ports |
| 3-1-3-1 | 88 | Initialize BIOS data area |
| 3-1-3-3 | 8A | Initialize extended BIOS data area |
| 3-1-4-1 | 8C | Initialize floppy controller |
| 3-2-1-1 | 90 | Initialize hard disk controller |
| 3-2-1-2 | 91 | Initialize local bus hard disk controller |
| 3-2-1-3 | 92 | Jump to UserPatch2 |

| | | |
|---|---|---|
| 3-2-2-1 | 94 | Disable A20 address line |
| 3-2-2-3 | 96 | Clear huge ES segment register |
| 3-2-3-1 | 98 | Search for option ROMs |
| 3-2-3-3 | 9A | Shadow option ROMs |
| 3-2-4-1 | 9C | Set up power management |
| 3-2-4-3 | 9E | Enable hardware interrupts |
| 3-3-1-1 | A0 | Set time of day |
| 3-3-1-3 | A2 | Check key lock |
| 3-3-3-1 | A8 | Erase F2 prompt |
| 3-3-3-3 | AA | Scan for F2 key stroke |
| 3-3-4-1 | AC | Enter Setup |
| 3-3-4-3 | AE | Clear in-POST flag |
| 3-4-1-1 | B0 | Check for errors |
| 3-4-1-3 | B2 | POST done–prepare to boot operating system |
| 3-4-2-1 | B4 | One beep |
| 3-4-2-3 | B6 | Check password (optional) |
| 3-4-3-1 | B8 | Clear global descriptor table |
| 3-4-4-1 | BC | Clear parity checkers |
| 3-4-4-3 | BE | Clear screen (optional) |
| 3-4-4-4 | BF | Check virus and backup reminders |
| 4-1-1-1 | C0 | Try to boot with INT 19 |
| 4-2-1-1 | D0 | Interrupt handler error |
| 4-2-1-3 | D2 | Unknown interrupt error |

| | | |
|---|---|---|
| 4-2-2-1 | D4 | Pending interrupt error |
| 4-2-2-3 | D6 | Initialize option ROM error |
| 4-2-3-1 | D8 | Shutdown error |
| 4-2-3-3 | DA | Extended block move |
| 4-2-4-1 | DC | Shutdown 10 error |
| 4-2-4-3 | DE | Keyboard controller failure (most likely problem is with RAM or cache unless no video is present) |
| 4-3-1-3 | E2 | Initialize the chipset |
| 4-3-1-4 | E3 | Initialize refresh counter |
| 4-3-2-1 | E4 | Check for forced flash |
| 4-3-2-2 | E5 | Check HW status of ROM |
| 4-3-2-3 | E6 | BIOS ROM is OK |
| 4-3-2-4 | E7 | Do a complete RAM test |
| 4-3-3-1 | E8 | Do OEM initialization |
| 4-3-3-2 | E9 | Initialize interrupt controller |
| 4-3-3-3 | EA | Read in bootstrap code |
| 4-3-3-4 | EB | Initialize all vectors |
| 4-3-4-1 | EC | Boot the Flash program |
| 4-3-4-2 | ED | Initialize the boot device |
| 4-3-4-3 | EE | Boot code was read OK |

**Table A-4 POST/beep codes for Phoenix ROM BIOS PLUS and Phoenix BIOS Version 1.xx**

| Port 80h Value | Beep Code | Error/Test Description |
|---|---|---|
| 01h | none | 80286 register test in progress |
| 02h | 1-1-3 | CMOS write/read test in progress or failure |
| 03h | 1-1-4 | BIOS ROM checksum in progress or failure |
| 04h | 1-2-1 | Programmable interval timer test in progress or failure |
| 05h | 1-2-2 | DMA initialization in progress or failure |
| 06h | 1-2-3 | DMA page register write/read test in progress or failure |
| 08h | 1-3-1 | RAM refresh verification in progress or failure |
| 09h | none | 1st 64K RAM test in progress |
| 0Ah | 1-3-3 | 1st 64K RAM chip or data line failure - multibit |
| 0Bh | 1-3-4 | 1st 64K RAM odd/even logic failure |
| 0Ch | 1-4-1 | 1st 64K RAM address line failure |
| 0Dh | 1-4-2 | 1st 64K RAM parity test in progress or failure |
| 10h | 2-1-1 | 1st 64K RAM*f* chip or data line failure - bit 0 |
| 11h | 2-1-2 | 1st 64K RAM chip or data line failure - bit 1 |
| 12h | 2-1-3 | 1st 64K RAM chip or data line failure - bit 2 |

| | | |
|---|---|---|
| 13h | 2-1-4 | 1st 64K RAM chip or data line failure - bit 3 |
| 14h | 2-2-1 | 1st 64K RAM chip or data line failure - bit 4 |
| 15h | 2-2-2 | 1st 64K RAM chip or data line failure - bit 5 |
| 16h | 2-2-3 | 1st 64K RAM chip or data line failure - bit 6 |
| 17h | 2-2-4 | 1st 64K RAM chip or data line failure - bit 7 |
| 18h | 2-3-1 | 1st 64K RAM chip or data line failure - bit 8 |
| 19h | 2-3-2 | 1st 64K RAM chip or data line failure - bit 9 |
| 1Ah | 2-3-3 | 1st 64K RAM chip or data line failure - bit A |
| 1Bh | 2-3-4 | 1st 64K RAM chip or data line failure - bit B |
| 1Ch | 2-4-1 | 1st 64K RAM chip or data line failure - bit C |
| 1Dh | 2-4-2 | 1st 64K RAM chip or data line failure - bit D |
| 1Eh | 2-4-3 | 1st 64K RAM chip or data line failure - bit E |
| 1Fh | 2-4-4 | 1st 64K RAM chip or data line failure - bit F |
| 20h | 3-1-1 | Master DMA register test in progress or failure |
| 21h | 3-1-2 | Slave DMA register test in progress or failure |
| 22h | 3-1-3 | Master interrupt mask register test in |

| | | |
|---|---|---|
| | | progress or fail |
| 23h | 3-1-4 | Slave interrupt mask register test in progress or fail |
| 25h | none | Interrupt vector loading in progress |
| 27h | 3-2-4 | Keyboard controller test in progress or failure |
| 28h | none | CMOS power-fail and checksum checks in progress |
| 29h | none | CMOS config info validation in progress |
| 2Bh | 3-3-4 | Screen memory test in progress or failure |
| 2Ch | 3-4-1 | Screen initialization in progress or failure |
| 2Dh | 3-4-2 | Screen retrace tests in progress or failure |
| 2Eh | none | Search for video ROM in progress |
| 30h | none | Screen believed operable: Screen believed running w/ video ROM |
| 31h | none | Monochromatic screen believed operable |
| 32h | none | 40-column color screen believed operable |
| 33h | none | 80-column color screen believed operable |
| 34h | 4-2-1 | Timer tick interrupt test in progress or failure |
| 35h | 4-2-2 | Shutdown test in progress or failure |
| 36h | 4-2-3 | Gate A20 failure |
| 37h | 4-2-4 | Unexpected interrupt in protected mode |
| 38h | 4-3-1 | RAM test in progress or failure above |

| | | |
|---|---|---|
| | | address 0FFFFh |
| 3Ah | 4-3-3 | Interval timer channel 2 test in progress or failure |
| 3Bh | 4-3-4 | Time-Of-Day clock test in progress or failure |
| 3Ch | 4-4-1 | Serial port test in progress or failure |
| 3Dh | 4-4-2 | Parallel port test in progress or failure |
| 3Eh | 4-4-3 | Math Coprocessor test in progress or failure |