

Troubleshooting AMI BIOS Beep Codes

The AMI BIOS is one of the most popular in the PC world today, and fortunately is quite consistent in its use of beep codes, across its many different versions. Please select the beep pattern you are hearing from the list in the index frame.

1 Beep: DRAM refresh failure

Explanation: The system is having a problem accessing the system memory to refresh it. Refreshing is done on all system memory to keep its contents active.

Diagnosis: This code usually means a problem either with the system memory or with the motherboard itself.

Recommendation:

Troubleshoot the motherboard.
Treat as an apparent memory failure.

2 Beeps: Parity circuit failure

Explanation: The parity circuit is responsible for generating and checking the parity bit on the system memory when parity checking is used. This circuitry is not working properly.

Diagnosis: This code usually means a problem with either the system memory or the motherboard.

Recommendation:

Treat as an apparent memory failure.
Troubleshoot the motherboard.

3 Beeps: Base 64K RAM failure

Explanation: There is a failure of some sort within the first 64 KB of system memory.

Diagnosis: The first bank of memory probably has a bad memory chip in it somewhere. It is possible that there is a failure related to the motherboard or a system device as well.

Recommendation:

Treat as an apparent memory failure.
Troubleshoot the motherboard.

4 Beeps: System timer failure

Explanation: There is a problem with one or more of the timers used by the system to control functions on the motherboard.

Diagnosis: This is usually a motherboard failure.

Recommendation: Troubleshoot the motherboard.

5 Beeps: Processor failure

Explanation: The system processor is generating an error condition indicating a problem with it.

Diagnosis: There is a problem related to the processor or motherboard. Note that this doesn't mean that the processor is necessarily dead; with a dead processor the system won't boot at all (it runs the BIOS code that is used to start up the PC.)

Recommendation:

Troubleshoot the processor.
If the processor is not at fault, troubleshoot the motherboard.

6 Beeps: Keyboard controller / gate A20 failure

Explanation: The keyboard controller is a chip on the motherboard that communicates with your keyboard. It also controls the A20 gate that provides access to the high memory area (HMA). This component is indicating a failure.

Diagnosis: This is usually a problem with either the keyboard or the motherboard.

Recommendation:

Troubleshooting the keyboard is relatively easy; try that first.

Troubleshoot the keyboard controller.

Troubleshoot as a motherboard failure.

7 Beeps: Virtual mode exception error

Explanation: Virtual mode is one of the different modes that the processor can run in. The system is reporting an error when testing this mode.

Diagnosis: There is a problem related to the processor or motherboard. Note that this doesn't mean that the processor is necessarily dead, since the system won't boot at all with a dead processor.

Recommendation:

Troubleshoot the processor.

Troubleshoot the motherboard.

8 Beeps: Display memory read/write failure

Explanation: The BIOS is unable to write to the frame buffer memory on the video card.

Diagnosis: This is usually caused by a problem with the video card, or the memory on the video card. It can also be a motherboard issue.

Note: Unlike the other AMI beep codes, this one is "non-fatal". The system may continue to boot despite this error.

Recommendation:

Troubleshoot the video card.

Troubleshoot the motherboard.

9 Beeps: ROM BIOS checksum failure

Explanation: The read-only memory (ROM) containing the BIOS program (which is what is running when you turn on the PC and what generates this error) uses a checksum value as a double-check that the ROM code is correct. This checksum is compared against the values in the ROM each time the PC is booted and if there is a mismatch, this

code is generated.

Note: This error is not the same as a CMOS Checksum Error, which refers to corrupted values of the CMOS settings, the ones you set through the BIOS setup program. This error means the contents of the BIOS code itself are damaged.

Diagnosis: The BIOS ROM chip on the motherboard is probably faulty. It could also be another component on the motherboard.

Recommendation: Troubleshoot the motherboard. It is possible to replace just the BIOS ROM chip but often replacing the motherboard will make more sense for cost and simplicity reasons.

10 Beeps: CMOS shutdown register read/write error

Explanation: A component of the motherboard is producing an error interacting with the CMOS memory that holds the BIOS settings.

Diagnosis: There is likely a problem with the motherboard.

Recommendation: Troubleshoot the motherboard.

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Diagnosis: There is likely a problem with the motherboard.

Recommendation: Troubleshoot the motherboard.

11 Beeps: Cache memory error

Explanation: The system has attempted to verify the operation of the secondary (level 2) cache and has encountered an error.

Diagnosis: This usually means a problem with the system cache. It may also be a more general problem with the motherboard.

Recommendation:

Troubleshoot the secondary cache.

Troubleshoot the motherboard.

Continuous Beeping: Memory or video problem

Explanation: The system is producing constant beeping in no specific pattern, or a fast "ringing" sound.

Diagnosis: This is usually caused by a problem with the system memory, or possibly the video card. The memory is more likely--the system complains long and loud if it can't find any usable memory, as there is no way to even start the boot process when this is the case. The motherboard itself could also be the problem.

Recommendation:

Troubleshoot the system memory.

Troubleshoot the video card.

Troubleshoot the motherboard.

Troubleshooting AWARD BIOS Beep Codes

Award is the other major BIOS provider today, along with AMI. Award uses by far the fewest beep codes of any of the BIOS manufacturers. In fact, they have only one beep code that I can find any reliable documentation on, and two others that I have had a couple of people report. (They prefer to use written error messages on screen, and only beep if they cannot access the video subsystem.) If there are others please let me know and I will add information on them.

1 Long Beep: Memory problem

Explanation: There is a failure of some sort related to the system memory.

Diagnosis: The first bank of memory probably has a failure of some sort; this is usually just a physical problem such as an incorrectly inserted module, but may also mean a bad memory chip in a module. It is possible that there is a failure related to the motherboard or a system device as well.

Recommendation:

Treat as an apparent memory failure.
Troubleshoot the motherboard.

1 Long, then 2 Short Beeps: Video error

Explanation: The BIOS is unable to access the video system in order to write any error messages to the screen.

Diagnosis: This is usually caused by a problem with the video card, or the memory on the video card. It can also be a motherboard issue.

Recommendation:

Troubleshoot the video card.
If the video card is not at fault, troubleshoot the motherboard.

1 Long, then 3 Short Beeps: Video error

Explanation: The BIOS is unable to access the video system in order to write any error messages to the screen.

Diagnosis: This is usually caused by a problem with the video card, or the memory on

the video card. It can also be a motherboard issue.

Recommendation:

Troubleshoot the video card.

If the video card is not at fault, troubleshoot the motherboard.

Continuous Beeping: Memory or video problem

Explanation: The system is producing constant beeping in no specific pattern, or a fast "ringing" sound.

Diagnosis: This is usually caused by a problem with the system memory, or possibly the video card. The memory is more likely--the system complains long and loud if it can't find any usable memory, as there is no way to even start the boot process when this is the case. The motherboard itself could also be the problem.

Recommendation:

Troubleshoot the system memory.

Troubleshoot the video card.

Troubleshoot the motherboard.