

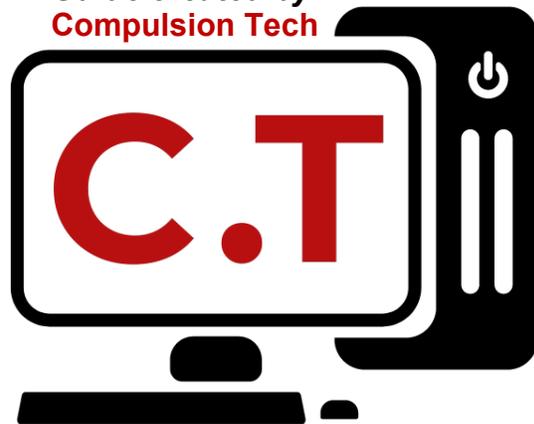
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BIOS TWEAKING GUIDE

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Guide created by
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Introduction

Updating your motherboard's BIOS to the latest Intel Microcode is essential for Intel 13th and 14th Gen CPUs to avoid voltage spikes that can lead to long-term hardware level degradation and system instability. This guide will walk you through the steps of updating your BIOS while preserving your system's configuration settings, including fan profiles, RAM overclocking profiles, and configuring new voltage & LLC settings. Ensuring these settings are correctly restored post-update is critical for maintaining long term system stability and reliability.

Note: If your system uses a RAID storage configuration, avoid performing the BIOS update unless you are familiar with RAID reconfiguration after the update. However, you can still follow the steps for adjusting the voltage and Load-Line Calibration (LLC) settings without updating the BIOS.

Step 1: Accessing Your BIOS

To begin the process, you'll need to access your system's BIOS:

1. Turn on your system by pressing the power button.
2. Immediately start pressing the Delete key repeatedly until the BIOS menu appears.

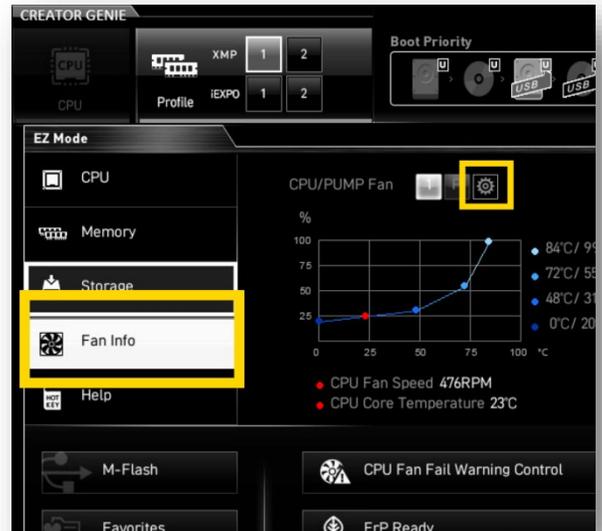


Step 2: Saving Fan and Pump Settings

Fan settings are crucial, particularly for systems with liquid coolers, as the pump requires specific RPM and power settings to function correctly. Some systems may have the pump plugged into a system fan header.

1. In the BIOS homepage (EZ Mode), click on Fan Info.
2. Click the Cog Icon above the fan diagram to access the detailed fan settings.
3. Take a photo of the settings for each fan curve, including all System Fans and both the CPU Fan and Pump Fan.
4. Make sure the photo captures all the settings including the mode (DC, PWM, or Auto, as this will need to be restored after the BIOS update).

This step ensures that cooling is correctly configured post-update, helping to prevent overheating or fan/pump malfunction.



Step 3: Recording RAM Settings

Before performing the BIOS update, it's important to record your current RAM configuration, because your system should have an XMP profile or custom RAM overclock settings already applied.

These settings will have been applied when your system was originally built and configured and will be UNIQUE to each computer, the images below are EXAMPLE IMAGES ONLY!

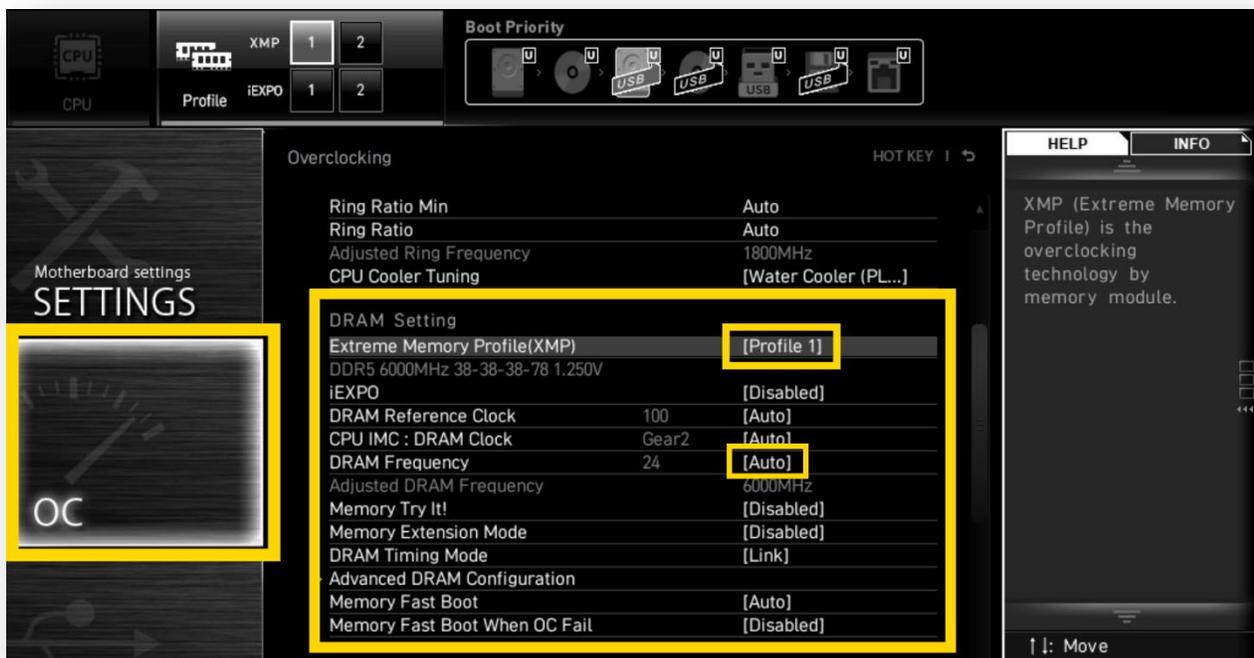
1. Press F7 (or click the advanced mode button at top of the screen) to enter the BIOS Advanced Mode.
2. Navigate to the OC (Overclocking Settings) menu.
3. Scroll down to DRAM Settings and note whether XMP Profile is enabled.
 - o Take note of which XMP profile is selected (e.g., XMP 1 or XMP 2).
4. Take note of the DRAM Frequency setting. If it has been manually adjusted, take note of the manual settings that have been applied for the XMP and the DRAM Frequency.
 - o See the **example below** which is showing what a custom DRAM Frequency setting could look like:

EXAMPLE IMAGE ONLY

Extreme Memory Profile(XMP)		[Disabled]
DRAM Reference Clock	100	[Auto]
CPU IMC : DRAM Clock	Gear2	[Auto]
DRAM Frequency	24	[4800 G2 (48x1.00...)]
Adjusted DRAM Frequency		4800MHz

A best practice is to take a photo of the entire page for quick reference.

This image is simply an example to show you where to find your DRAM setting and what to capture in the photo.



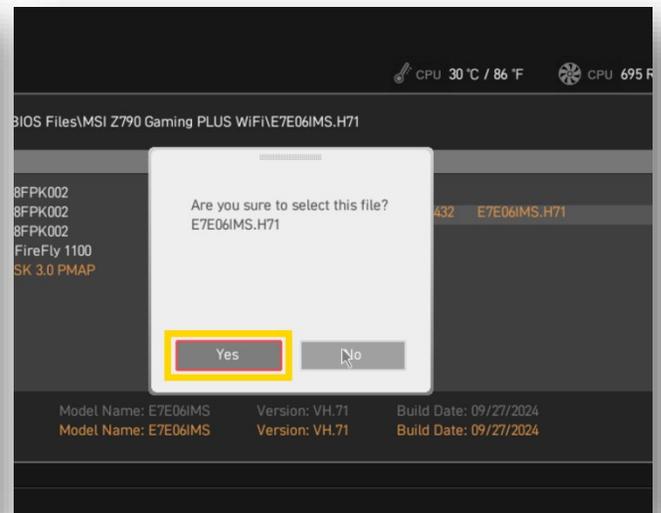
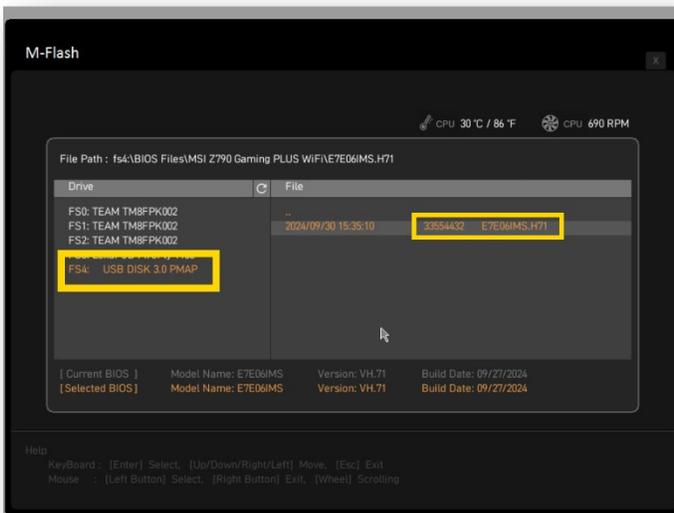
Step 4: Updating the BIOS

This step assumes you have already downloaded and prepared a USB drive with the correct BIOS file for your motherboard as per the instructions at the bottom of the blog post article.

1. In the BIOS, click M-Flash in the bottom-left corner.
2. Select Yes when asked if you want to enter flash mode.



3. Navigate to the USB drive where the BIOS update file is saved, select the file, and press Enter.
4. Confirm the update and allow the process to proceed.

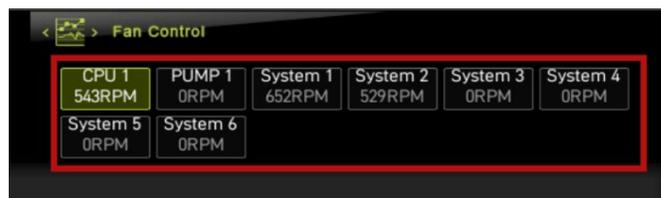


- The computer will reboot several times during the update process. Do not power off the computer or interrupt the process.

Step 5: Reconfiguring Fan Settings

After the BIOS update completes, your system will reboot into the default BIOS settings. To avoid any cooling issues, it's essential to reconfigure the fan settings you recorded earlier.

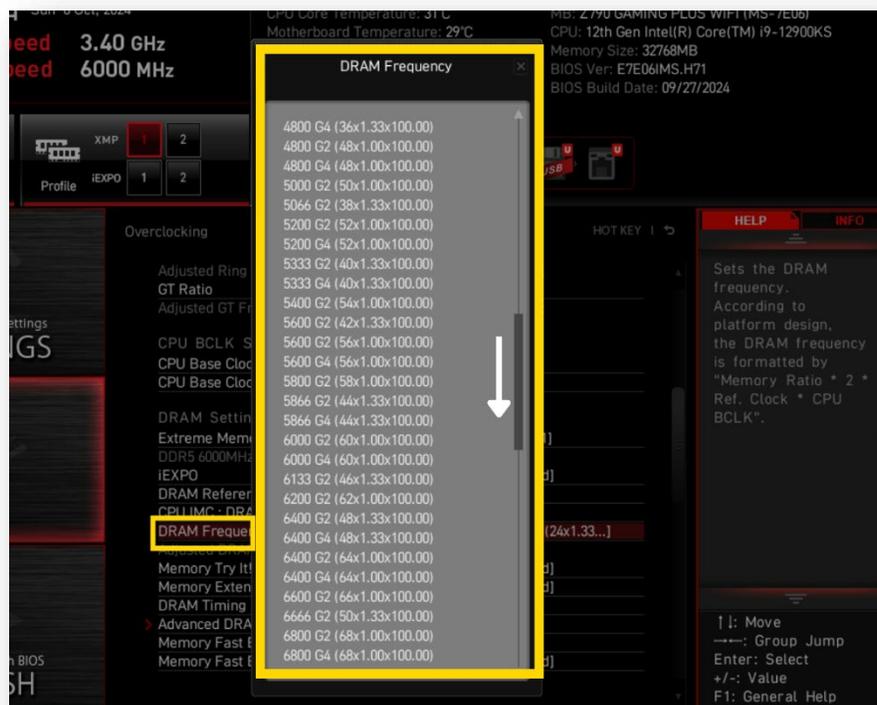
1. Re-enter the BIOS by pressing Delete on startup (refer to Step 1).
2. Return to the Fan Info menu and restore the settings for each fan according to the photo you took for each system fan along with the CPU fan and the pump. (refer to Step 2)
 - o Ensure that you re-apply custom fan curves for every fan because some systems will have the Liquid Cooler Pump hooked up to a System Fan Header.



Step 6: Restoring RAM Overclock Profiles

Once the fans are reconfigured, the next step is to restore your RAM settings.

1. In Advanced Mode, navigate to the OC Settings menu (refer to Step 3).
2. Re-enable the XMP Profile (if any) that was active before the BIOS update.
3. If your system had a manually adjusted DRAM Frequency (the DRAM Frequency Setting was set to something different than AUTO), ensure that you re-set it to match the value you recorded before the BIOS update:



Step 7: Setting Power Limits & LLC Control

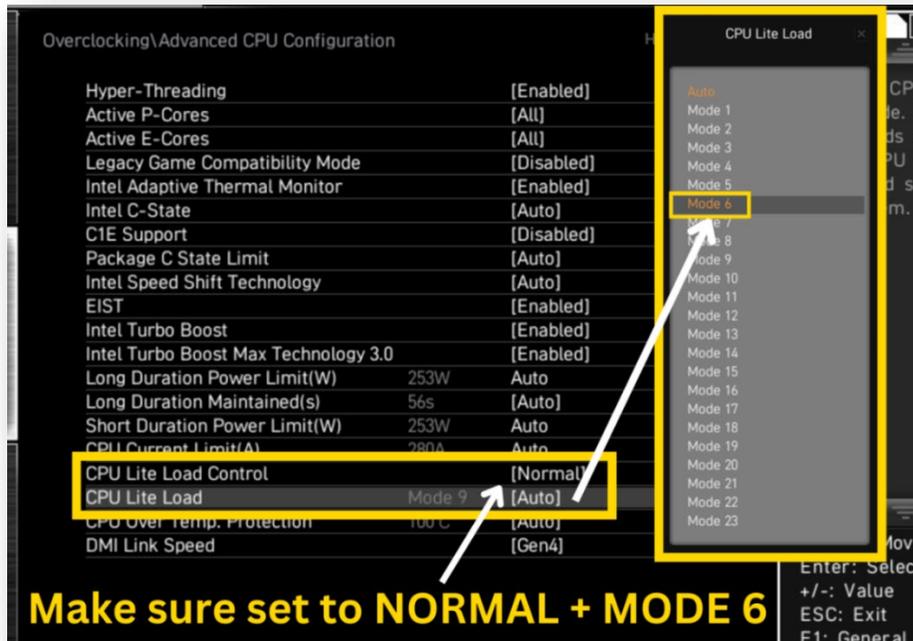
1. In OC Settings (you should still be in OC settings from the previous step), scroll at the top of the page look for CPU COOLER TUNING.
2. Select the 253W power limit.
 - It will either be called 'Water Cooler PL1 253W' or 'MSI Performance Settings PL1 253W'



3. Next, navigate to Advanced CPU Configuration menu, press enter to open it.



4. Navigate down to the CPU Lite Load Control section.
- Set CPU Lite Load Control to Normal and adjust CPU Lite Load from AUTO to Mode 6.
 - These settings help prevent voltage spikes and ensure long-term CPU stability without a significant performance impact.

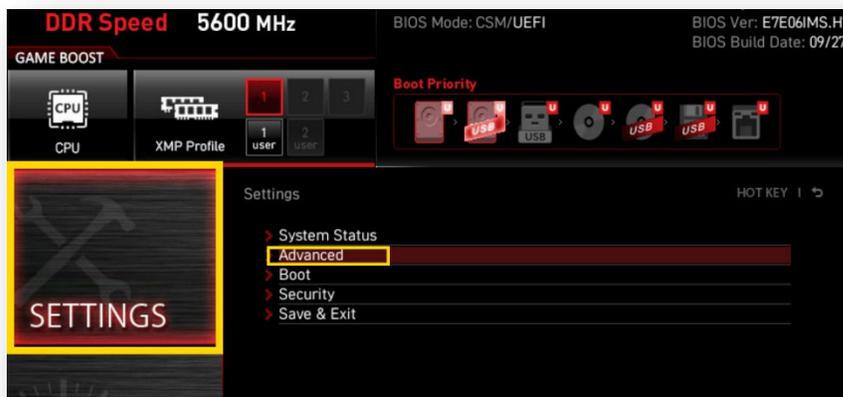


5. Ensure Long Duration & Short Duration Power Limits are set to below specs;
- Change **Long Duration** Limit from 'Auto' to '150'.
 - Change **Short Duration** Limit from 'Auto' to '190'.
 - You can change this by selecting the Limit and typing the number into the area where auto is shown in red below:



Step 8: Setting the PCI-E Riser Mode

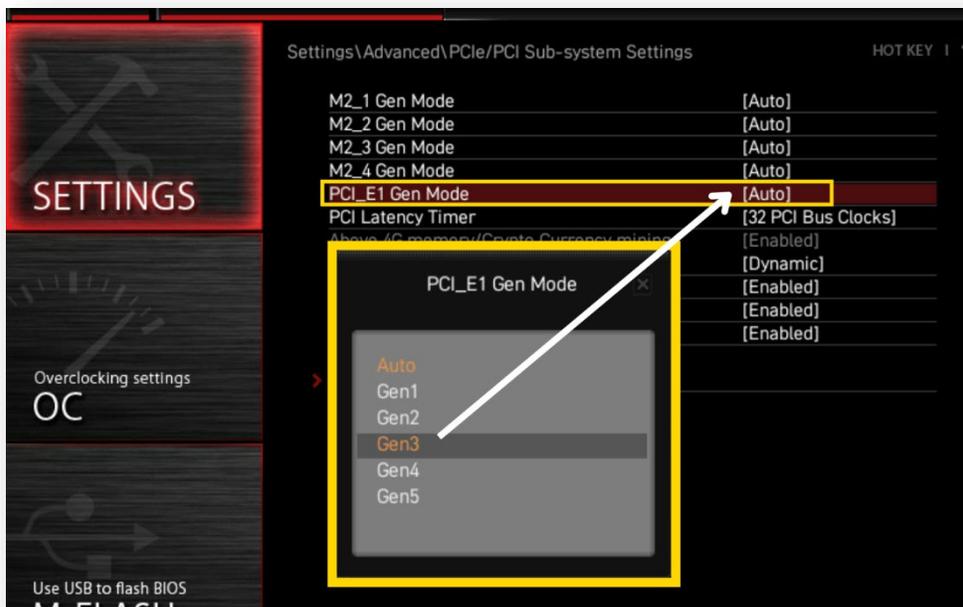
1. Next, press 'ESC' or click the back arrow to leave the advanced CPU configuration. Now select the 'Motherboard SETTINGS' menu and select Advanced:



2. Select the PCIe/PCI Sub-system Settings:



3. Now on the PCI-E1 Gen Mode option, change it from Auto to Gen3:



Step 9: Saving and Exiting the BIOS

After all the settings have been restored, save your changes and exit the BIOS.

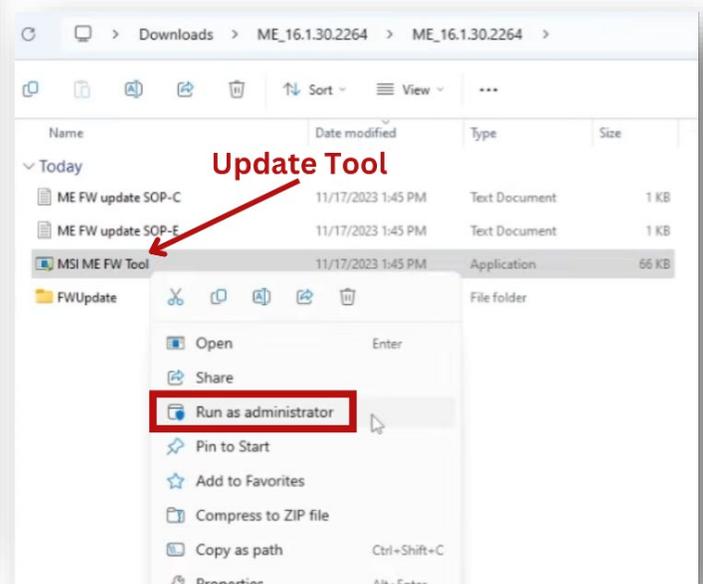
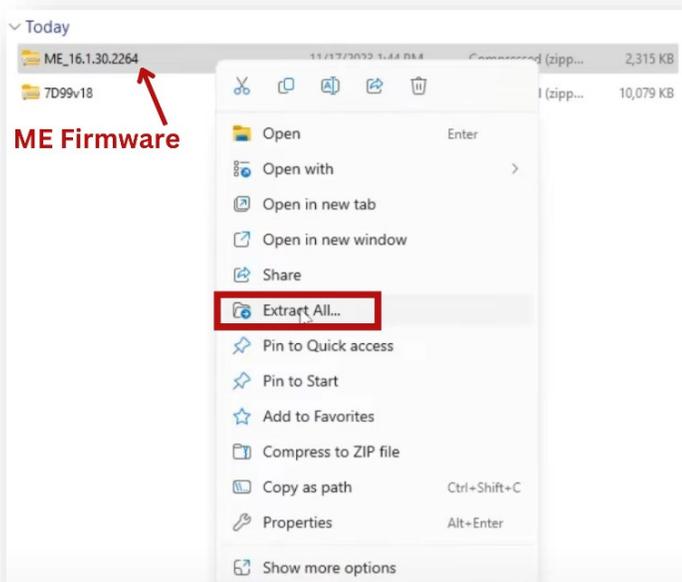
1. Press F10 or navigate to Save & Exit in the top-right corner.
2. Confirm that all settings are saved, and allow the system to reboot.



Step 10: Updating the ME Firmware

Once you are back in the Windows operating system, you can navigate back to the download location of the ME Update file that you downloaded at the beginning of the process (alongside the BIOS file).

1. Extract the ME update file by right clicking and extracting all, or extracting with your preferred file extraction tool (7ZIP, Winwar, etc)
2. Now open the extracted file and run the Application 'MSI ME FW Tool' as an ADMINISTRATOR. Follow the prompts to complete the installation and then reboot your system.



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