



Intel Flash Memory Update Utility Users Guide

Revision 1.1

Information in this document is subject to change without notice and does not represent a commitment on the part of Intel Corporation. No part of this program or publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without the prior written permission of Intel Corporation. Any unauthorized duplication is a violation of US copyright and other laws which may result in severe monetary and criminal damages.

Copyright ©1996, 1997 Intel Corporation. All rights reserved.

Intel Corporation
5200 NE Elam Young Parkway
Hillsboro, OR 97124-6497

Printed in USA

Contents

1. Overview.....	4
1.1 Introduction	4
1.2 Operating Modes	4
1.2.1 Normal Update Modes.....	4
1.2.2 Recovery Update Mode.....	5
2. Operation	6
2.1 Interactive Mode	6
2.1.1 Verify Flash Memory Area with a File	8
2.1.2 Save Flash Memory Area to a File	9
2.1.3 Update Flash Area from a File	10
2.1.4 Display Flash Header.....	11
2.1.5 Exit Program	11
2.2 Command Line Mode	12
2.2.1 GUI-Mode Options	12
2.2.1.1 /m Monochrome Display.....	12
2.2.1.2 /b Use video calls	12
2.2.1.3 /t Use EGA/VGA line count.....	12
2.2.1.4 /n Do not use pointer device.....	12
2.2.2 Command-Line Mode Switches	13
2.2.2.1 /h or /? Help	13
2.2.2.2 /q Quiet Mode	13
2.2.3 Switches.....	13
2.2.3.1 /r Force reboot after update.....	13
2.2.3.2 /@ Use override file	13
2.2.3.3 /f Force CMOS after update.....	13
2.2.3.4 /d Enable debugging output.....	13
2.2.3.5 /p Program FLASH device with contents of 'pathname'	13
2.2.3.6 /v Verify current FLASH with contents of 'pathname'	13
2.2.3.7 /sX Save current FLASH to pathname (or 'vvvv'BIOS).....	13
2.2.3.8 /c Check flash image in 'pathname' without programming	14
2.2.3.9 /x eXamine flash header of 'pathname'	14
3. Recovery Mode.....	15
3.1 Description	15
3.2 Creating a Bootable Recovery Diskette.....	15
3.3 To Enter Recovery Mode.....	16

1. Overview

1.1 Introduction

This User's Guide documents the Intel Flash Memory Update Utility. The utility is a DOS executable that reprograms flash memory with new versions of Basic Input Output System (BIOS) code or other flash data, such as language blocks, logos, or user code/data. This allows upgrades to be performed in the system without removing parts or covers.

The Intel Flash Memory Update Utility verifies that the new BIOS image is compatible with the current BIOS for consistent BIOS reprogramming. The BIOS informs the utility when an inconsistency is detected, and will not allow updating a BIOS with an incompatible type. This prevents an incorrect BIOS being placed into flash memory.

Previous BIOS code and data was stored on EPROM media, which required parts to be programmed prior to being placed into the system during production. BIOS updates with EPROMs required parts to be removed and reprogrammed.

One disadvantage of using flash memory for BIOS is the possibility of a power failure during an update. An incomplete BIOS would render the system non-functional. The update utility includes a method of recovering from a power failure during a BIOS update. Before attempting to update your BIOS, we highly recommend that you make a recovery diskette (see Section 3.2).

This document does not define in detail either the flash memory part or the BIOS internals not relevant to flash reprogramming.

1.2 Operating Modes

There are three basic modes of operation for the Intel Flash Memory Update Utility: the Interactive Mode, the Command Line Mode, and the Recovery Mode. The Interactive Mode and the Command Line Mode are "normal update" modes. The keyboard and video monitor are available for issuing commands, locating files, and informing you of progress. "Normal Update" modes also allow you to update areas of flash memory other than the BIOS areas.

In the "Recovery Update" Mode, only the system floppy disk services are available. The keyboard and video services are not available and predetermined actions are performed by the utility without user interaction. Only the system BIOS areas can be updated in this mode. Results and status are communicated to the user with beep codes through the speaker services.

1.2.1 Normal Update Modes

You execute the Intel Flash Memory Update Utility from floppy diskette or the hard disk, after you do a plain DOS boot with no memory managers or other software installed on the target system. The "Normal Update" Mode allows you to update flash memory with the system BIOS or other code/data. You must specify the BIOS or data to retrieve from various sources (floppy, hard disk, etc). See Section 2.1 for procedures.

1.2.2 Recovery Update Mode

This mode is used if, during a normal system BIOS update, a power failure or system reset occurred, corrupting the BIOS because the update didn't finish. You therefore cannot boot the system. The "Recovery Update" would be executed only in very rare cases. It is anticipated that a power-outage or system reset would seldom occur during flash updates. In the vast majority of cases, only normal updates will be performed. See Section 2.2 for Recovery Mode procedures.

2. Operation

2.1 Interactive Mode

This section describes operation in the Interactive Mode. In this mode, the monitor and keyboard provide menu selection, file selection, help information, and status messages. You can navigate through the menu structure and lists using the arrow keys. Alternatively, you can operate in the Command Line Mode (refer to Section 2.2).

1. The system must be running plain DOS in Real Mode with no extended memory managers (such as EMM386.exe) loaded. If you are running Windows 95, Windows NT, OS/2, Linux, or any other non-DOS operating system, you will need to boot from a diskette (you can use the recovery diskette- Refer to Section 3.2).
2. Type **iflash** <Enter> to start the Intel Flash Memory Update Utility. Press <Enter> to dismiss the introductory window. You should now see two windows, similar to Figure 2-1. The menu selections shown in all the figures are typical, and your system may have more or fewer selections, depending upon the capability and content of its BIOS.

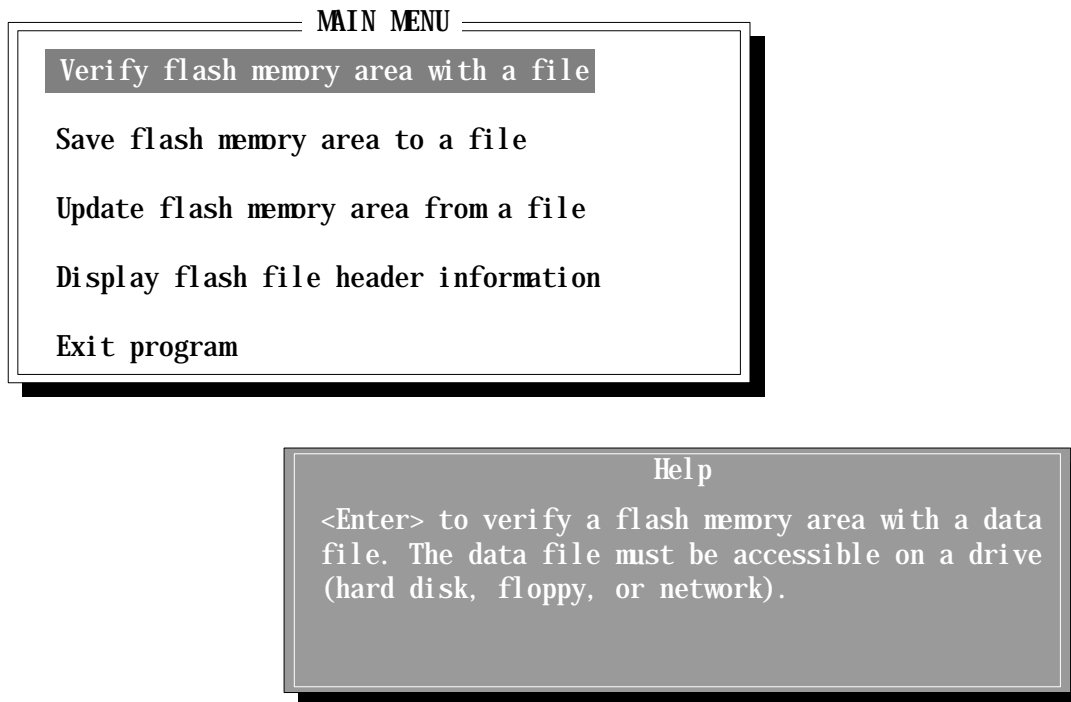


Figure 2-1. Intel Flash Memory Update Utility Menu screen

3. Use the up/down arrows to select the desired function from the menu. Notice that the Help window changes as each function is selected. For your convenience, the menu selections and their corresponding help windows are transcribed in the table below.

Menu Selection	Help Window Text
Verify flash memory area with a file	<Enter> to verify a flash memory area with a data file. The data file must be accessible on a drive (hard disk, floppy, or network). <i>This selection will not be supported in future versions.</i>
Save flash memory area to a file	<Enter> to save a flash memory area to a file. The resulting data file can be used to re-program a flash area. <i>This selection will not be supported in future versions.</i>
Update flash memory area from a file	<Enter> to update a flash memory area with a data image. The data file must be accessible on a drive (hard disk, floppy, or network). WARNING: This action will destroy the contents of the specified flash area.
Display flash file header information	<Enter> to display the header information for a flash image data file. The data file must be accessible on a drive (hard disk, floppy, or network).
Exit program	<Enter> to exit the program

2.1.1 *Verify Flash Memory Area with a File*

This option will not be supported in future versions, and therefore may not appear on your menu. When you select this menu item, the following submenu appears (Figure 2-2):

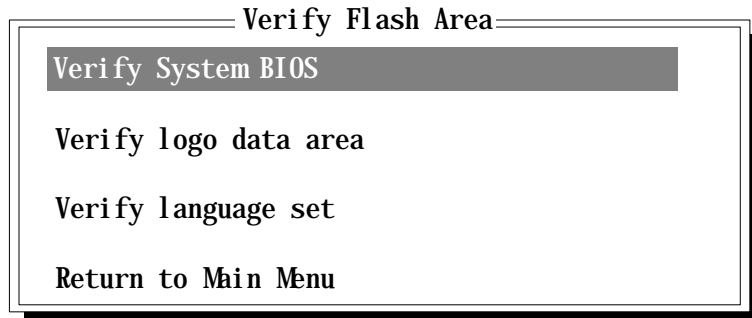


Figure 2-2. Verify Flash Area Menu

This menu compares your existing flash memory area with a file, to verify that they are identical (that is, the area was installed or saved correctly). The utility asks you to enter the path\filename of the BIOS file, logo data file, or language set file to which the flash image should be compared. The utility assumes the following suffixes for these files:

BIOS File	.bio
Logo Data File	.usr
Language Set File	.lng

These suffixes can be overridden if your system uses nonconventional filenames.

If the verify is successful, the utility returns you to the Main Menu with no message. If the verify is not successful, you will receive one or more error messages within a red window.

The last selection returns you to the main menu (Figure 2-1).

2.1.2 *Save Flash Memory Area to a File*

This option will not be supported in future versions, and therefore may not appear on your menu. This selection brings up the following submenu

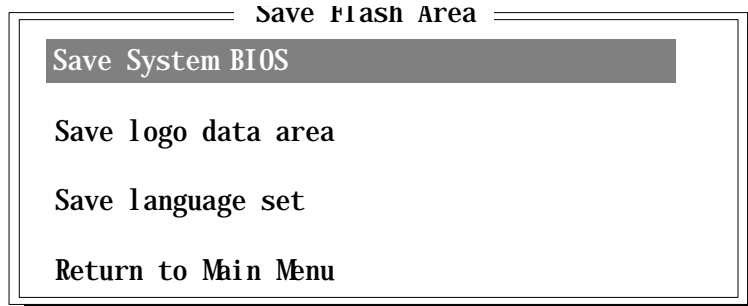


Figure 2-3. Save Flash Area Menu

This menu allows you to write your existing Flash memory area to a file, giving you a backup. The utility asks you to enter the path\filename of the BIOS file, logo data file, or language set file to save. The utility assumes the following suffixes for these files:

BIOS File	.bio
Logo Data File	.usr
Language Set File	.lng

These suffixes can be overridden if desired.

Enter the path, filename, and extension of the file to be saved. The system next asks for an image title. This is the title that will appear if you display header information. You can leave it blank, or enter a string of no more than 29 characters including spaces.

If the save is successful, the utility returns you to the Main Menu when completed. If the save is not successful, you will receive one or more error messages within a red window.

As usual, the last selection returns you to the main menu (Figure 2-1).

2.1.3 Update Flash Area from a File

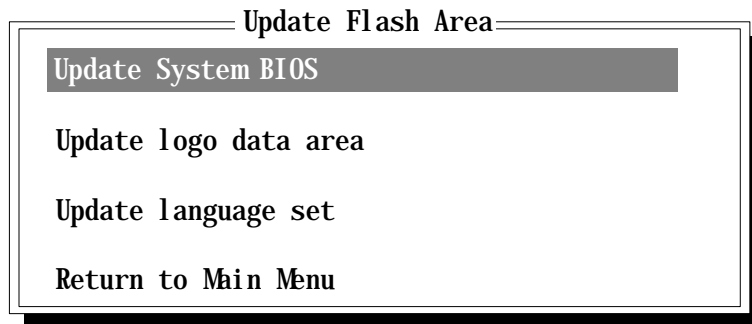


Figure 2-4. Update Flash Area Menu

This menu allows you to update your existing flash memory area from a file. We recommend that you first verify that you have the correct files (see Section 2.1.1), and save your current flash area(s) to a file(s) as a backup (see Section 2.1.2) if you have these options.

The utility asks you to enter the path\filename of the BIOS file, logo data file, or language set file to use for the update. The utility assumes the following suffixes for these files:

BIOS File	.bio
Logo Data File	.usr
Language Set File	.lng

These suffixes can be overridden if desired.

After you select a file, the utility asks you to confirm, and displays the action. Carefully check the displayed BIOS Image Title, Time Stamp, and BIOS Version and ID before proceeding, or press the right arrow key to select <Cancel programming>.

The system next verifies the file image to see if it is present and complete, then programs the BIOS with the new image. During this time, it is especially critical that you do not turn off the system power.

If the update is successful, the utility presents a Completed/Reboot message. Press <Enter> to reboot. ***If system power is lost during reprogramming, the system will be rendered unbootable.***

As usual, the last selection returns you to the main menu (Figure 2-1).

2.1.4 Display Flash Header

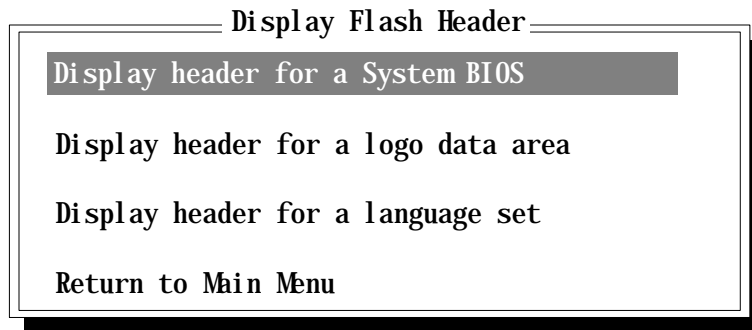


Figure 2-5. Display Flash Header Menu

These menu selections display the header information for the selected files: BIOS (.bio, .bi1, etc), logo/data area (.usr), or language set area (.lng). The utility allows you to specify a path and filename.

2.1.5 Exit Program

This menu selection terminates the Intel Flash Memory Update Utility and returns you to the DOS prompt.

2.2 Command Line Mode

The Command Line Mode accomplishes the same results as the Interactive Mode described in Section 2.1, but does it from an `a:` prompt. This method may be preferable in a process automation atmosphere, or for the convenience of those who prefer command-line interfaces, or for enhanced debugging output.

The typical command line is to type, at the `A>` prompt, `iflash/sw`, where `/sw` is one (or more) of the switches described below. For instance, typing `iflash/h` <Enter> displays a screenful of the (available) switches with a brief description of each, similar to the following:

Intel Flash Memory Update Utility Part 643643-019

```
GUI-mode options:
  /m - Monochrome Display           /b - Use BIOS video calls
  /t - Use EGA/VGA line count       /n - Do not use pointer device

Command-line mode switches:
  /h Help (this text)              /q - Quiet mode; errors only

Standard options:
  /r Force reboot after update      /@ - Use override file
  /f Force CMOS after update        /d - Verbose debugging output
  /p pathname - Program flash device with contents of 'pathname.'
  /v pathname - Verify current flash with contents of 'pathname.'
  /sX pathname - Save resident flash area to 'pathname' (or 'vvvv'BIOS).
                  X = { 'B'IOS, 'L'anguage, 'U'ser, or 'R'ecovery } area.
  /c pathname - Check flash image in 'pathname' without programming.
  /x pathname - eXamine flash header of 'pathname'.
```

2.2.1 GUI-Mode Options

2.2.1.1 /m Monochrome Display

This switch tells the GUI library to display in the high-contrast mode. This mode is often better for monochrome displays.

2.2.1.2 /b Use video calls

This switch allows using BIOS services to draw the display, versus direct screen writes.

2.2.1.3 /t Use EGA/VGA line count

This switch allows the Intel Flash Memory Update Utility to run in a mode other than 80 characters x 25 lines.

2.2.1.4 /n Do not use pointer device

Use this switch if your mouse driver is incompatible with the Intel Flash Memory Update Utility.

2.2.2 Command-Line Mode Switches

2.2.2.1 /h or /? Help

Displays a list and brief description of all command-line options, similar to the list on the previous page.

2.2.2.2 /q Quiet Mode

This switch displays no status messages, only error messages.

2.2.3 Switches

2.2.3.1 /r Force reboot after update

Reboots the system automatically without prompting when update is completed.

2.2.3.2 /@ Use override file

This switch is included for historical reasons, to maintain backward compatibility. Instructions for its use are included with your files on the floppy disk if needed.

2.2.3.3 /f Force CMOS after update

This switch reprograms the CMOS with the standard default options stored in the BIOS.

Note-- Any custom default options will be lost.

2.2.3.4 /d Enable debugging output

This switch displays verbose status reporting.

2.2.3.5 /p Program FLASH device with contents of 'pathname'

This switch will first validate the FLASH image, then program the device with the contents of the file.

2.2.3.6 /v Verify current FLASH with contents of 'pathname'

This switch will not be supported in future versions. This switch verifies the current contents of the iFLASH device with the contents of a file.

2.2.3.7 /sX Save current FLASH to pathname (or 'vvvv'BIOS)

This switch will not be supported in future versions. This switch saves the current flash contents to a file. The 'vvvv' can be a pathname.

The 'X' can be one of the following:

- | | |
|---|--|
| B | Saves the BIOS area (includes language and user areas) |
| L | Saves the language area |
| U | Saves the user area |
| R | Saves the recovery area. |

2.2.3.8 /c Check flash image in ‘pathname’ without programming

This switch checks for the presence of the needed files, and tests to see that the BIOS is compatible with the upgrade.

2.2.3.9 /x eXamine flash header of ‘pathname’

This switch displays the header of the specified file.

3. Recovery Mode

3.1 Description

As mentioned previously, if you suffer a power failure while the flash memory is being written, your BIOS will be corrupted and you will not be able to boot your system. To guard against this possibility, you need to create a bootable diskette with the Intel Flash Memory Update Utility and the correct recovery BIOS data files for your system. These files are typically available from your vendor; if they are bundled into one .zip file, you will need to extract them.

Recovery Mode should be used only when your system BIOS is corrupted such that it will not boot. This is most likely to occur only when there has been a power interruption during the flash updating process.

However, some machines do not support recovery mode and must be sent back to the vendor for reprogramming. Refer to your computer documentation to determine whether your machine supports recovery mode.

3.2 Creating a Bootable Recovery Diskette

The *minimal* files that should be included on the recovery diskette are:

- bios.rec or biosxxx.rec, where xxx is the last part of the BIOS ID seen during boot. Additionally, there may be similar files with extensions .re1, .re2, etc.
- If you *do not* have the additional files mentioned above, then you also need all *.bi<number> files supplied: .bi1, .bi2, etc.
- beep.com
- iflash.exe
- autoexec.bat (ONLY the one that came with the package should be used.)

Do NOT include a config.sys file.

To make the disk bootable, place it in the a: drive and type **sys a: <Enter>**.

Test the disk by booting on it. It should start the Intel Flash Memory Update Utility in the normal mode.

3.3 To Enter Recovery Mode

1. Turn off your system and unplug its power cord.
2. Remove the system cover and move a motherboard jumper¹ to activate the Recovery BIOS.
3. Place the bootable recovery diskette containing the Intel Flash Memory Update Utility and at least the minimal BIOS files in Drive A (see Section 3.2, Creating a Bootable Recovery Diskette).
4. Power up the system. The system should boot, automatically program the BIOS to a predefined configuration, and sound two high-pitched beeps when successfully completed. There is no keyboard or monitor support in the recovery mode. If the operation is unsuccessful, the system will continually sound a series of low-pitched beeps.
5. Turn off the system and unplug its power cord. Place the recovery jumper in its original (normal operation) position, then re-boot for the updated BIOS to take effect.

¹ See your system documentation for specific jumper location.