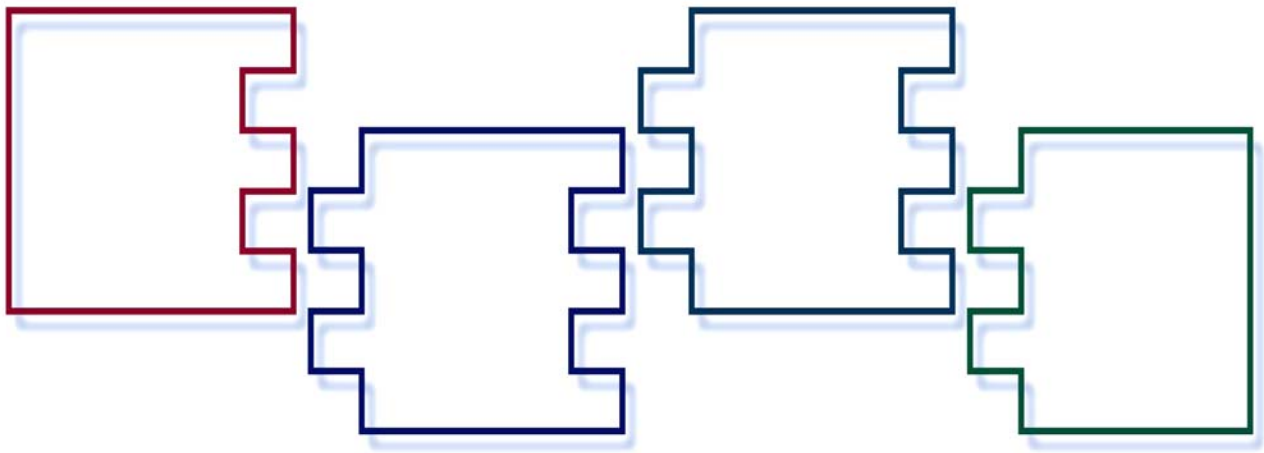


Phlash16[™]



Technical Reference

Enabling a world of digital convergence

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Contacting Us

Corporate Address: Phoenix Technologies Ltd.
411 East Plumeria Drive
San Jose, California 95134
USA

Web site: www.phoenix.com

Manual revision: September 18, 2002

Table of Contents

CHAPTER 1

| | |
|--|----------|
| Introduction | 1 |
| <i>Installing the Phlash16 utility</i> | <i>1</i> |

CHAPTER 2

| | |
|---|-----------|
| Running Phlash16..... | 3 |
| <i>Command prompt operation</i> | <i>4</i> |
| <i>PHLASH16.EXE and memory managers</i> | <i>8</i> |
| Disabling memory managers..... | 8 |
| MS-DOS 5.0 (or later)..... | 9 |
| <i>The Crisis Recovery Disk</i> | <i>10</i> |
| Creating the Crisis Recovery Disk..... | 10 |
| Using the Crisis Recovery Disk | 12 |
| Updating the Crisis Recovery Disk..... | 13 |

APPENDIX A

| | |
|------------------------------|----|
| Phlash16 Error Messages..... | 15 |
|------------------------------|----|

Introduction

The Phoenix Phlash16 utility is a 16-bit application which runs in an MS-DOS environment to update, backup, and restore the system BIOS on a flash device. This utility uses command-line arguments or a response file to set or override default behavior. It can be used manually with MS-DOS, or automatically loaded from the Crisis Recovery Disk which is used to restore or update the system BIOS.

The following table describes the features of the Phlash16 program.

Table 1-1 Phlash16 features

| File Name | Description | Operating System | Uses PHLASH.INI | Crisis Recovery | Command Line Mode |
|--------------|--------------------|---------------------|-----------------|-----------------|-------------------|
| PHLASH16.EXE | 16-bit application | MS-DOS, MINIDOS.SYS | No | Yes | Yes |

Installing the Phlash16 utility

To install Phlash16, unzip the files listed below to a directory on your hard drive (e.g., C:\PHLASH).

- PACKING.LST—Lists all files contained in the Phlash16 package
- FLASHPRO.EXE—BIOS support required for Phlash16
- PHCOMP.EXE—Executable file for the Phcomp program, a tool to compress the BIOS image
- PHLASH16.EXE—Executable file for Phlash16 program
- README.TXT—Important notes on Phlash16 program
- PH16TECH.PDF—*Phlash16 Technical Reference*
- PH16UG.PDF—*Phlash16 User's Guide*

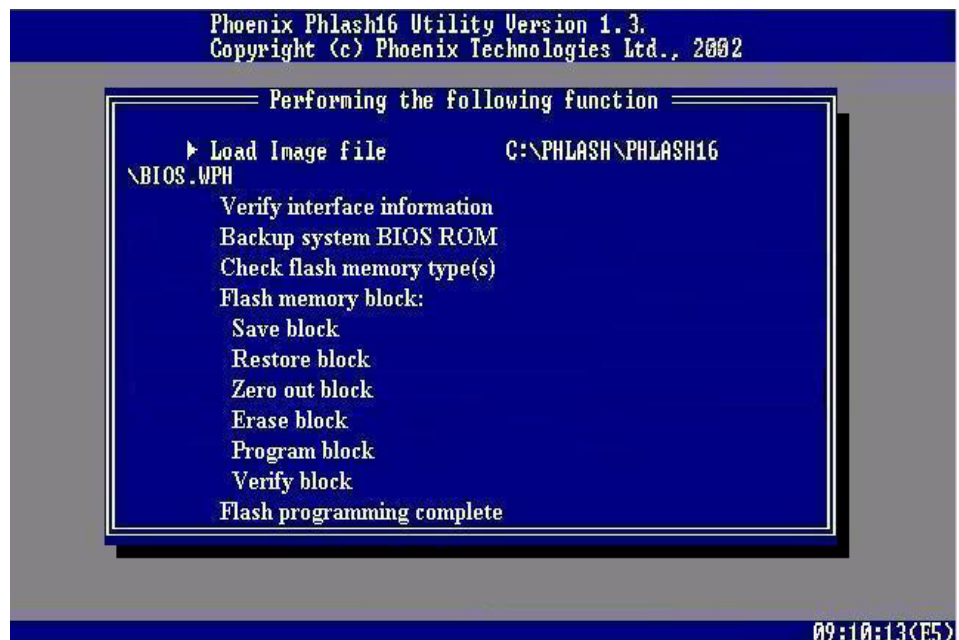
Running Phlash16

Phlash16 can *only* be run as a command prompt utility.

To run Phlash16 from the command prompt, perform the following:

1. Close all programs.
2. Access the command prompt.
3. Type: `plash16 <options>` to display a message box with a progress meter like this:

Figure 2-1 Progress meter



Note

Do *not* interrupt the program before it completes the tasks listed.

Command prompt operation

When you run Phlash16 from the command prompt, you can perform the following options:

- Flash a new BIOS to your system
- Backup existing BIOS before flashing
- Verify the new BIOS checksum before flashing
- Flash only if new image is more recent than existing BIOS
- Minimize messages and delays
- Verify the BIOS number before flashing
- Do not flash, but read existing flash part and print to screen
- Disable *Axx* auto detection.

With Phlash16, instead of specifying arguments on the prompt command line, you can put the command-line parameters in a response file, and use the file name as an argument in the command line.

The options can be set in several different places:

- BIOS file (the .WPH file with the new BIOS image)
- Phlash16 command line
- Phlash16 response file.

Note

You must run Phlash16 under MS-DOS, *not* from Windows.

In Windows 98, you can also run MS-DOS from the Windows Startup Menu by performing these steps:

1. Click Start, and then click Shut Down.
2. Click Restart, and then click OK.
3. After the system starts rebooting, repeatedly press F8 until the Windows Startup Menu displays.
4. Use the arrow keys to highlight Safe Mode with Command Prompt, and then press Enter.

Note

Phlash16 does *not* run in any environment with memory management such as an MS-DOS Window or Window Console. Do *not* run MS-DOS with CONFIG.SYS or AUTOEXEC.BAT. Do *not* open any memory manager such as HIMEM.SYS or EMM386. Refer to the *PHLASH16.EXE and memory managers* section in this chapter.

To flash a new BIOS, you also need a BIOS file with the new BIOS image (e.g., BIOS.WPH).

The following describes the syntax for using Phlash16 from the command prompt.

Syntax:

PHLASH16 [*options*]

The following table describes the command prompt options available for Phlash16.

Table 2-1 Phlash16 options

| Phlash16 Options | Description |
|------------------|--|
| romfile | Override the default BIOS image name BIOS.WPH with "file\ Note: In the response file, the command is B:[<i>file name</i>]. |
| @rspfile | Response file containing more options |
| /A:n | 32-bit address where to put the File Image |

| Phlash16 Options | Description |
|-----------------------|---|
| /BBL | Program boot block |
| /BU[= <i>name</i>] | Backup flash memory into BIOS.BAK before programming.\n; If \" <i>name</i> \" specified, override the default file name BIOS.BAK |
| /C | Clear CMOS checksum after programming |
| /CS | Verify BIOS.WPH image checksum |
| /DMC: <i>string</i> | Specify chassis manufacturer DMI string |
| /DMM: <i>string</i> | Specify motherboard manufacturer DMI string |
| /DMS: <i>string</i> | Specify system manufacturer DMI string |
| /DOxx: <i>string</i> | Specify OEM DMI string number xx |
| /DPC: <i>string</i> | Specify chassis product ID DMI string |
| /DPM: <i>string</i> | Specify motherboard product ID DMI string |
| /DPS: <i>string</i> | Specify system product ID DMI string |
| /DSC: <i>string</i> | Specify chassis serial number DMI string |
| /DSM: <i>string</i> | Specify motherboard serial number DMI string |
| /DSS: <i>string</i> | Specify system serial number DMI string |
| /DUS: <i>string</i> | Specify UUID DMI string |
| /DVC: <i>string</i> | Specify chassis version DMI string |
| /DVM: <i>string</i> | Specify motherboard version DMI string |
| /DVS: <i>string</i> | Specify system version DMI string |
| /DEV | Display device information from WPH file |
| /EXIT | Exit without rebooting |
| /H or /? | Help screen |
| /I | Verify image size matches flash part size |
| /MOD: <i>filename</i> | Update the module in the BIOS with the module contained in the file (e.g., /MOD:logo.mod); the rest of the BIOS will remain unchanged |
| /MODE= <i>n</i> | Specify mode <i>n</i> (0, 1, 2, 3) |

| Phlash16 Options | Description |
|---------------------|---|
| /MFG | Manufacturing mode - Automatically reboot without key press |
| /N | Program only if BIOS.WPH is different than system BIOS |
| /NOB | Do not allow an older BIOS to be flashed to the platform |
| /NOBIOSINFO | Do not display BIOS date and part number while flashing |
| /O | Override (disable) all options from BIOS.WPH |
| /P | Production mode (minimize messages and delays) |
| /PF= <i>string</i> | String to pass on to command line |
| /PN | Program only if same BIOS part number |
| /REMOTE | Specify remote operation over RS232 |
| /RO[= <i>name</i>] | Read contents of flash part and save to a file without flashing |
| /Rn | Retry flashing a block n times if flash fails |
| /S | Silent operation (turn off speaker) |
| /SWAP=NO | Disable Axx autodetection |
| /T | Show debug timing info (Warning: flash is done TEN TIMES!) |
| /UUID | Causes Phlash16 to generate a UUID to be used for the DMI string of the same name; this should <i>not</i> be used with /DUS |
| /V | Verify each block after programming it |
| /X | Ignore XMS memory manager check |

The BIOS file contains not only the new BIOS binary to flash, but also the data required to write the BIOS to the particular flash device on your system. It often has a name like BIOS.WPH.

Instead of specifying arguments for Phlash16 on the command prompt line, you can use a response file, an ASCII text file that consists of /options separated by a space or carriage return. This is useful for repeated uses of the same combinations of arguments.

The following line is an example of the content of a response file:

```
/C /MFG /SWAP=NO
```

PHLASH16.EXE and memory managers

Phlash16 may fail if your system is using memory managers, in which case the utility will display the following message:

Figure 2-2 Memory manager error message



If you see this message after you execute Pflash16, you must disable the memory manager on your system. To do so, follow the instructions in the *Disabling memory managers* section in this chapter.

Note

For more detailed information on error messages, refer to *Appendix A Pflash16 Error Messages*.

Because Pflash16.EXE may require the use of extended memory, it will not run if it detects the presence of an extended-memory manager such as HIMEM.SYS, EMM386, or QEMM. To avoid conflict with disk caching programs, the program checks for VCPI, DPMI and XMS.

Note

The program does not check for VDISK because MS-DOS 5 and later versions do not support that server.

If the program detects any of these utilities, the program reports a failure and terminates.

Disabling memory managers

To avoid failure when flashing, you must disable the memory managers that load from CONFIG.SYS and AUTOEXEC.BAT. There are two recommended procedures for disabling the memory managers, depending

on the operating system you are using. One consists of pressing the <F5> key (only if you are using MS-DOS 5.0 or above), and the other requires the creation of a boot disk.

MS-DOS 5.0 (or later)

For MS-DOS 5.0 or later, follow the steps below to disable any memory managers on your system. If you are not using at least MS-DOS 5.0, then you must create a boot disk to bypass any memory managers.

1. Re-boot your system.
2. When MS-DOS displays the Starting MS-DOS message, press <F5>.

After you press <F5>, MS-DOS bypasses the CONFIG.SYS and AUTOEXEC.BAT files, and therefore does not load any memory managers.

You can now execute Phlash16.

Creating a boot disk

Note

The boot disk you create is different from a Crisis Recovery Disk. For details about creating the Crisis Recovery Disk, refer to *The Crisis Recovery Disk* section in this chapter.

To bypass memory managers in MS-DOS versions previous to 5.0, you can use this recommended procedure:

1. Insert a disk into your A: drive.
2. Enter the following from the command line:

```
Format A: /S
```

3. Reboot your system from the A: drive.

Your system will now boot without loading the memory managers, and you can then execute Phlash16.

Using Windows

If you are using Windows, follow these steps to disable any memory managers on your system.

1. Re-boot your system.
2. When MS-DOS displays the Starting Windows message, press <F8> to display the Windows Startup Menu.
3. Select *Safe mode command prompt* only. The system bypasses the CONFIG.SYS and AUTOEXEC.BAT files and does not load any memory managers.

You can now execute Phlash16.

Using MS-DOS

If you are running MS-DOS version 6.0 or earlier, create a system boot disk to bypass the memory managers. Perform these steps:

1. Insert a disk into your A: drive.
2. Enter the following from the command line:

```
Format A: /S
```

3. Reboot your system from the A: drive.

Your system will now boot without loading the memory managers, and you can then execute Phlash16.

The Crisis Recovery Disk

You can use the Crisis Recovery Disk to restore a BIOS when it has become corrupted, and your system does not boot.

Creating the Crisis Recovery Disk

If a Crisis Recovery Disk was *not* provided with your Phlash16 package, then you should create one *before* using the Phlash16 utility.

The Crisis Recovery files are shipped as a compressed file called CRISDISK.ZIP that contains the following files:

- **BIOS.WPH**—BIOS image file to be flashed
- **PHLASH16.EXE**—16-bit Phlash executable
- **CRISDISK.BAT**—Batch file that creates the Crisis Recovery Disk
- **MINIDOS.SYS**—Crisis operating system

- **CRISBOOT.BIN**—Data file
- **PTLBOOT.BIN**—Data file
- **MAKEBOOT.EXE**—Creates a proprietary boot partition
- **VGABIOS.ROM**—Optional VGA image for platforms with a local VGA BIOS

To install these files on your hard disk:

1. Insert the distribution disk into drive A:
2. Unzip the contents of CRISDISK.ZIP into a local directory (e.g., C:\PHLASH).
3. Store the distribution disk in a safe place.

Note

For more information on the CRISDISK.ZIP file, refer to the *PhoenixBIOS Developer's Reference*.

There are two methods of creating the Crisis Recovery Disk—you can create it in a Windows DOS box or in *real* DOS (*not* a Windows DOS box).

Creating a Crisis Recovery Disk in Windows DOS

To create the Crisis Recovery Disk in a Windows DOS box:

Note

Because WINCRIS.EXE does *not* function correctly under Window NT, 2000, or XP, you *cannot* create a Crisis Recovery Disk under these operating systems (OS).

1. Unzip the contents of the CRISDISK.ZIP file into a local directory.
2. Execute the WINCRIS.EXE file to create the standard Crisis Recovery Disk. The WINCRIS.EXE program performs the following steps:
 - a. Formats the Crisis Recovery Disk.
 - b. Copies the necessary files to the disk in the proper order.

- c. Writes the customized boot sector to the disk, which causes the disk to boot, not from the BIOS, but from the PhoenixBIOS Boot Block for Crisis Recovery Mode.

3. Write-protect and label the Crisis Recovery Disk.

Creating a Crisis Recovery Disk in real DOS

To create a Crisis Recovery Disk in real DOS:

- 1.** Copy or unzip the Phlash16 files onto your hard disk. (e. g., into C:\PHLASH).
- 2.** Insert a clean disk into drive A:
- 3.** If you are running a Windows MS-DOS box, in the directory in which you copied the above files, type:

```
CRISDISK A: <Enter>
```

- 4.** Write-protect and label the Crisis Recovery Disk.

Creating a Crisis Recovery CD-ROM

To create a CD-ROM version of the Crisis Recovery Disk:

- 1.** Create a Crisis Recovery Disk (floppy disk). Refer to the previous sections on *Creating a Crisis Recovery Disk in a Windows DOS box* and *Creating a Crisis Recovery Disk in real DOS*.
- 2.** Create a bootable CD using the image of the Crisis Recovery Disk.

Using the Crisis Recovery Disk

If your system hangs, does not respond, and you are unable to reboot it, the BIOS may have been corrupted, in which case you use the Crisis Recovery Disk to restore the system BIOS and reboot your system.

If the BIOS in your system fails and does not post any messages to the screen, it beeps repeatedly, prompting you to put the Crisis Disk in the A: drive.

After you put the Crisis Disk in the A: Drive, the Phlash16 program takes over and copies the BIOS image on the flash device. When the flash is complete, it beeps once. Remove the disk and reboot your system.

Updating the Crisis Recovery Disk

If the BIOS image (BIOS.WPH) changes due to an update or bug fix, you can easily update the Crisis Recovery Disk. Simply copy the new BIOS.WPH image onto the disk.

Or

You can copy the BIOS.WPH to your C:\PHLASH directory and run CRISDISK A:. This will update your Crisis Recovery Disk as well.

Phlash16 Error Messages

The following table describes the Phlash16 error messages.

Table A-1 Error messages

| Error Codes | Error Message |
|--------------|--|
| -1 or // FF | Memory allocation for Backup file buffer failed. |
| -2 or // FE | BIOS.BAK already exists (rename or delete it). |
| -3 or // FD | File Create failed on BIOS.BAK. |
| -4 or // FC | File Write failed on BIOS.BAK. |
| -5 or // FB | File Close failed on BIOS.BAK. |
| -6 or // FA | BIOS backup not supported in BIOS ROM file. |
| -7 or // F9 | File Open failed on BIOS ROM file. |
| -8 or // F8 | File Read failed on BIOS ROM file. |
| -9 or // F7 | File Close failed on BIOS ROM file. |
| -10 or // F6 | Failed to locate signature bytes in BIOS ROM file. |
| -11 or // F5 | Unsupported BIOS ROM file version |
| -12 or // F4 | V0.10 must fit ROM size and address within 1 MB. |
| -13 or // F3 | V2.00 must have block descriptor table and image buffer. |
| -14 or // F2 | Device table has too many entries. |
| -15 or // F1 | Device table has unsupported flash type. |

APPENDIX A PHLASH16 ERROR MESSAGES

| Error Codes | Error Message |
|--------------|---|
| -16 or // F0 | Combined SAVE or RESTORE attributes in BIOS file. |
| -17 or // EF | SAVE block without matching RESTORE block in BIOS file. |
| -18 or // EE | V0.10 must have JMP table for platform procs. |
| -19 or // ED | V2.00 must have OFFSET table for platform procs. |
| -20 or // EC | BIOS file found errors in command line parameters. |
| -21 or // EB | Part ID not found in table of supported parts. |
| -22 or // EA | Allocation for BIOS ROM image failed. |
| -23 or // E9 | Open failed on BIOS ROM file. |
| -24 or // E8 | Read failed on BIOS ROM file. |
| -25 or // E7 | Copy of REAL to EXTENDED memory buffer failed. |
| -26 or // E6 | File Close failed on BIOS.WPH. |
| -27 or // E5 | Cannot flash if Memory Managers (e.g. EMM 386) present. |
| -28 or // E4 | Attempt to read flash memory ID failed. |
| -29 or // E3 | BIOS ROM file failed to return flash memory ID. |
| -30 or // E2 | Could not find BCP SYS block in BIOS.WPH file image. |
| -31 or // E1 | File has different BIOS part number. |
| -32 or // E0 | File contains same version of BIOS ROM image. |
| -33 or // DF | Data written to flash does not match BIOS ROM image. |
| -34 or // DE | Write to flash memory failed. |
| -35 or // DD | Erase flash memory block failed. |
| -36 or // DC | VPP is not at expected level. |
| -37 or // DB | Erase sequence failed. |
| -38 or // DA | New DMI string is too large. |
| -39 or // D9 | Specified BIOS ROM file is not for this system. |
| -40 or // D8 | Allocation for DMI OEM string failed. |

APPENDIX A PHLASH16 ERROR MESSAGES

| Error Codes | Error Message |
|--------------|--|
| -41 or // D7 | No space for specified DMI OEM string in BIOS ROM. |
| -42 or // D6 | DMI OEM strings require BCP DMI 0.1+. |
| -43 or // D5 | Could not find BCP DMI block in BIOS ROM file image. |
| -44 or // D4 | Cannot flash if Memory Managers (e.g. HIMEM) present. |
| -45 or // D3 | BIOS ROM file may be corrupt (checksum not zero). |
| -46 or // D2 | BIOS ROM file size doesn't match flash part size. |
| -47 or // D1 | DMI system and chassis strings require BCP DMI 2.1+. |
| -48 or // D0 | BIOS ROM file is older than (or same as) BIOS ROM image. |
| -49 or // CF | Platform signature not found in the interface. |
| -50 or // CE | Device descriptor signature not found in the interface. |
| -51 or // CD | Part table signature not found in the interface. |
| -52 or // CC | Invalid part count found in the interface. |
| -53 or // CB | Invalid text descriptor size found in the interface. |
| -54 or // CA | Invalid part descriptor size found in the interface. |
| -55 or // C9 | Cannot flash when DOSKEY is present. |
| -56 or //C8 | Duplicate device support found in the interface. |
| -57 or //C7 | Program terminated due to command line option. |