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## User's Guide

### TERABYTE UNLIMITED

10220 Lazy Bear Street

Las Vegas, NV 89131

<http://www.TeraByteUnlimited.com>

ASP Member

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## Technical Support Policy

Technical support is provided online. Software and documentation updates are available at [www.terabyteunlimited.com](http://www.terabyteunlimited.com).

- The Image for Windows home page, with software and documentation update information, and support resources, can be found at [www.terabyteunlimited.com/imagew.html](http://www.terabyteunlimited.com/imagew.html).
- A support knowledge base for all TeraByte Unlimited products, including Image for Windows, can be found at [www.terabyteunlimited.com/kb](http://www.terabyteunlimited.com/kb).

Registered users can email their questions to [support@terabyteunlimited.com](mailto:support@terabyteunlimited.com), if no suitable resolution is found via the aforementioned support resources. If the issue is not resolved via email, telephone support may be provided.

Unregistered users will be provided technical support and product information through email only.

In all cases, TeraByte Unlimited reserves the right to refuse any communication method that would incur a cost.

## Ombudsman Statement

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## System Requirements

If you will be restoring outside of Windows, or are running Windows 95/98/Me, your computer's BIOS must provide access to the hard drive.

<b>Hardware</b>	<ul style="list-style-type: none"><li>• IBM-compatible personal computer.</li><li>• 32-MB RAM (minimum)</li><li>• Writable CD or DVD drive (optional)</li></ul>
<b>Operating System</b>	<ul style="list-style-type: none"><li>• Windows NT (requires Administrator privileges)</li><li>• Windows 2000 (requires Administrator privileges)</li><li>• Windows 2003 (requires Administrator privileges)</li><li>• Windows XP (requires Administrator privileges)</li><li>• Windows 95</li><li>• Windows 98</li><li>• Windows Millennium</li></ul>

## General Information

Image for Windows (often referred to simply as “IFW”) is a backup and restore program that is designed to run under Microsoft Windows. Image for Windows protects your system by creating a compressed or uncompressed “snapshot” of all *used areas* of your FAT, FAT32, NTFS, Ext2/3, or ReiserFS partition or volume. For other file systems, they save and restore a compressed or uncompressed snapshot of *all sectors* in the partition or volume (i.e. both used and unused areas).

The snapshot backup created by Image for Windows is referred to as an “image”. The image backup can be written to a set of files on a hard drive, network drive, or directly to most USB 2, IEEE 1394, ATAPI CD-R/RW, or writable DVD drives.

When you create the image, the file system and files are backed up exactly as they are on your drive at the time of the backup. Image for Windows does not skip files or assume that some files do not need to be backed up. The sole exception to this is that if you are using Image for Windows with the free [PHYLock](#) add-on, the paging file (PAGEFILE.SYS) and hibernation file (HIBERFIL.SYS), when present, will not be backed up. (This is done to save space in the image, and because there is no need to backup those files.) Image for Windows works at the *sector* level, not at the *file* level.

After backing up with Image for Windows, your computer is protected from crashes, data loss, hardware problems, and malicious software (i.e. viruses), since you can restore the snapshot image whenever you need to.

If you need to restore individual files or folders from a backup, you can use the free TBIView add-on, available from [www.terabyteunlimited.com](http://www.terabyteunlimited.com) or on your installation CD, if your purchase included one.

Image for Windows creates images that are fully compatible with the other TeraByte Unlimited imaging programs, such as Image for DOS, Image for Linux, and BootIt NG. The reverse is also true: Images created by other TeraByte Unlimited imaging programs are compatible with Image for Windows.

# Image for Windows Usage Examples

## Local Usage

Use Image for Windows to backup your Windows partition, using the free [PHYLock](#) add-on. Store your image backups on a secondary hard drive partition, or on a CD/DVD disc. Then, when you need to restore, boot from a floppy diskette or bootable CD/DVD disc that has Image for DOS installed on it, and use Image for DOS to perform the restore operation.

## Across a Network

Save backups to, or restore from, a mapped network drive.

## In the Windows PE Environment

Use the free [BartPE plugin](#) to create a CD/DVD disc that enables you to run Image for Windows in the PE environment, and backup to or restore from any drive accessible from there.

# Installing Image for Windows

1. From the [www.terabyteunlimited.com](http://www.terabyteunlimited.com) web site, click the **Image for Windows** link under the **Downloads** section. Or, click [here](#) for a direct link to the EXE file.
  - If you purchased Image for Windows on prepackaged media, you need not download a new copy, but doing so will ensure that you obtain the latest version available.
2. Save the file, `IFWSETUP.EXE`, to a folder on your hard drive.
3. Once the download completes, locate and run `IFWSETUP.EXE`. The **Image for Windows Setup Menu** should appear.
4. In the **Image for Windows Setup Menu**, click the indicated link to run Image for Windows setup. The **Image for Windows Setup Wizard** should appear.
5. The **Image for Windows Setup Wizard** will guide you through the installation. Simply follow the instructions provided.
  - If you are updating Image for Windows (rather than installing Image for Windows for the first time) you will be asked if you want to overwrite `CDBOOT.F35`. Unless you have your own custom copy of `CDBOOT.F35` in place, respond “Yes”, and allow the existing copy to be overwritten. (If you had a custom `CDBOOT.F35` file, you would know it.) Allowing the existing `CDBOOT.F35` file to be overwritten will ensure that any bootable CD/DVD discs you create will contain the latest version of Image for DOS.

## What is CDBOOT.F35?

The file `CDBOOT.F35` is used to make any CD or DVD you create with Image for Windows (or Image for DOS) bootable. Image for DOS is contained within `CDBOOT.F35`, allowing you to perform restore operations as needed.

If you use the trial version of Image for Windows (or Image for DOS) to create a bootable CD or DVD, you will be able to restore that image for 30 days. After that time, you will only be able to restore that image using a registered version of Image for Windows (or Image for DOS).

The registered copies of Image for Windows (and Image for DOS) have what is referred to as a full-use version of `CDBOOT.F35`. This full-use version allows you to not only boot with any CD or DVD you create with the software, but also to restore from any images contained on the applicable discs, free of any time restriction.

If you are a registered user of Image for Windows, a trial version of `CDBOOT.F35` will automatically be updated to a full-use version when either of the following events takes place:

- You manually enter your Image for Windows registration information.
- You use your registered copy of Image for Windows to create a bootable CD/DVD disc.

If you are a registered user of Image for Windows, you generally do not have to worry about `CDBOOT.F35`. When upgrading to the latest version of Image for Windows, just overwrite `CDBOOT.F35` when prompted (unless you are using your own custom copy of `CDBOOT.F35`), and then use Image for Windows as you normally do. The software will always function in full-use mode.

There is one special note for registered users of Image for Windows who do not normally use Image for Windows to create bootable CD/DVD discs, yet still need a full-use copy of `CDBOOT.F35` for other purposes (e.g. for use with the free add-on utility BINGBURN): Whenever you have updated Image for Windows (assuming you also choose to overwrite `CDBOOT.F35` during setup), you will need to manually "force" the new copy of `CDBOOT.F35` to become a full-use version. To do this:

1. Use Image for Windows to initiate a backup to CD/DVD.
2. Cancel the operation when Image for Windows prompts you to insert the first disc.

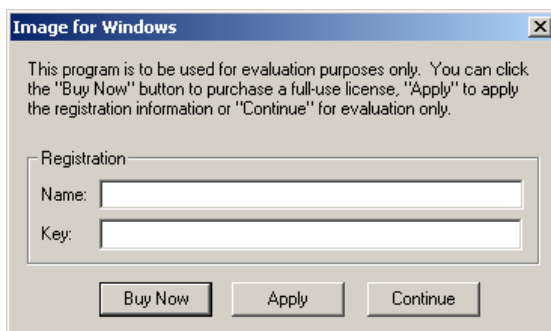
At that point, `CDBOOT.F35` will have been converted to a full-use copy. As an alternative, you may use the copy of `CDBOOT.F35` from your latest registered copy of Image for DOS, since it will already be a full-use copy. Either way, depending on how you intend to use `CDBOOT.F35` after that point, you may also need to expand it using the free [IMGFLPYD](#) utility.

Please note that Image for Windows looks for `CDBOOT.F35` in the same directory that the Image for Windows program (`IMAGEW.EXE`) is running from. Image for DOS looks for `CDBOOT.F35` in the current directory of the DOS environment. (This may be of importance to you if you plan to use your own custom batch file with Image for Windows and/or Image for DOS.)



# Running Image for Windows

1. The first time you start Image for Windows, a registration screen will display.



- If you purchased Image for Windows, continue to step 2 below.
  - If you are using the trial version of Image for Windows, click Continue, and Image for Windows will operate in 30-day trial mode. Skip steps 2 and 3 below.
2. If you have purchased a boxed version of Image for Windows, you will find your registration information on the CD sleeve that was included. If you purchased a download-only copy of Image for Windows, you will have received an email message with the registration name and key. Either way, enter the registration information exactly as it appears, including any numbers following the name. (The name is everything after [name] and before [key]. If you received the registration information via email, the name may have wrapped to a second line.)

There may be special circumstances in which it is not convenient or possible to manually enter the Image for Windows registration information. Image for Windows provides two methods to account for this type of scenario:

- **For use in PE environments:** Image for Windows can run in registered-use mode by detecting the presence of a registration key file, named `IMAGEW.KEY`. To use this method, open a text editor such as Notepad, and enter your Image for Windows registered user name on the first line, with your Image for Windows key on the second line. For example:

```
User Name  
XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX
```

Then, save this file as `IMAGEW.KEY`. Please note that Image for Windows will look for `IMAGEW.KEY` in the current directory. Also note that using `IMAGEW.KEY` does not result in the registration information being permanently applied to the system.

- **For multi-workstation deployment:** Image for Windows registration information can be permanently applied to the system using `IMAGEW.INI`. To use this method, open a text editor such as Notepad, and add the following content:

```
[License]  
Key=User Name XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX-XXXX
```

Where `User Name` is the registered name to be applied, and `XXXX[...]` is the applicable registration key. Save this file as `IMAGEW.INI` in the same folder where `IMAGEW.EXE` resides. If the registration information in `IMAGEW.INI` is accepted, the `Key=` line will be automatically removed from the file, and the Image for Windows registration information will be added to the Windows registry.

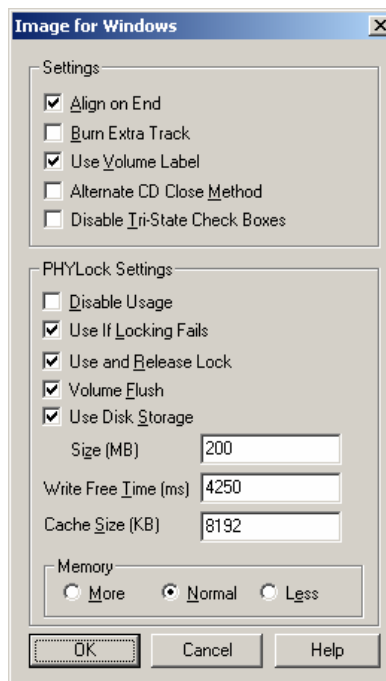
3. Click **Apply**. The Image for Windows window will display.



## Configuring Image for Windows

The first time you start Image for Windows, you should make sure the settings are appropriate for your system. The meaning of each setting is described in the **Image for Windows Settings** table that follows.

1. Click the **Settings** button. The Image for Windows settings dialog appears.



2. Check a box to enable a setting.
  - Each of the settings is explained below.
3. Click **OK** when you are done.

Image for Windows Settings	
<b>Align on End</b>	Ensures that restored partitions are aligned at the end of a cylinder. You should leave this setting checked.
<b>Burn Extra Track</b>	Enable this option to write the image summary data to the first CD/DVD as track two when directly imaging to CD/DVD. When burned this way, you will not have to insert the last CD/DVD before beginning the restore. <b>Note:</b> This option may not work correctly with all CD/DVD devices.
<b>Use Volume Label</b>	If this option is enabled and the drive contains an EMBR then FAT/FAT32/HPFS partition names will be that of the volume label instead of the name in the MPT. If no EMBR exists then this option is assumed.
<b>Alternate CD Close Method</b>	If you experience errors or problems when a CD is closing during an image to CD operation then enable this option to try a different closing technique.
<b>Disable Tri-State Check Boxes</b>	Enabling this option changes the behavior of the partition selection check boxes so that you can select an extended partition (itself) as the source of a backup.
PHYLock Settings	
<p>PHYLock is an optional software component for Windows NT/2000/XP/2003 that enables Image for Windows to maintain a consistent, reliable backup of an unlocked (i.e. in-use) partition or volume. If you purchased a boxed version of Image for Windows, you can find PHYLock on the CD that was included with your purchase. Otherwise, you can obtain PHYLock at <a href="http://www.terabyteunlimited.com">www.terabyteunlimited.com</a>, using the Free Software link.</p> <p>It should be noted that the consistency is based on a point in time. Although there is an attempt to pick a “clean” point in time, there is no guarantee that all programs, internal caches, and other processes are in a clean state. This is true of <i>all</i> backup software that backs up a partition or volume that is in use.</p> <p>If none of the usage options below are enabled, then PHYLock will be used, if it is installed. Options titled in blue are only in effect if PHYLock version 2 is installed.</p>	
<b>Disable Usage</b>	Enable this option if you do not want to use PHYLock, even if it is installed.
<b>Use If Locking Fails</b>	Use PHYLock if a normal lock on the backup source partition cannot be obtained.
<b>Use and Release Lock</b>	Attempt a normal lock, then use PHYLock whether or not the lock was obtained. If a normal lock was obtained, it is unlocked after PHYLock is enabled.
<b>Volume Flush</b>	Attempts forcing an additional flush on the volume.
<b>Use Disk Storage</b>	This setting causes PHYLock to use hard disk storage in addition to memory, up to the limit specified in the <b>Size</b> setting. Note that even with this setting enabled, PHYLock may sometimes run in RAM mode. Requires PHYLock version 2.
<b>Size</b>	This setting determines how much hard disk space is allocated for use by PHYLock, and applies only if the <b>Use Disk Storage</b> setting is enabled. Requires PHYLock version 2.
<b>Write Free Time (ms)</b>	This is the amount of time, in milliseconds, that must pass before PHYLock will become enabled. During this time, there can be no updating of the backup source partition contents. You should try to keep the value above 1250. The default value is 4250.

<b>Cache Size (KB):</b>	<p>This is the size of the internal cache, in kilobytes, used by PHYLock to maintain the data consistency. The default is 8192 (8192 KB / 1024 = 8 MB).</p> <p>You should not use a value below 2048 for this setting, even if you have the <b>Use Disk Storage</b> setting enabled.</p> <p>When backing up NTFS partitions with the <b>Use Disk Storage</b> option <i>disabled</i>, the value of the <b>Cache Size (KB)</b> setting will need to be weighed against the size of the NTFS log. You should keep the value of this setting above the size of the NTFS log, whether by increasing this value, reducing the size of the NTFS log, or both.</p> <p>You can check the size of the NTFS log file using the command line “CHKDSK &lt;drive letter&gt;: /L”. (The same command line will show you what the default NTFS log size is for the volume in question.) You can change the size of the NTFS log using “CHKDSK &lt;drive letter&gt;: /L:&lt;log file size (KB)&gt;”.</p> <p>Setting the NTFS log too small can result in performance degradation or a failure to boot. Do not set the size of the NTFS log to a value lower than 4096 KB.</p>
<b>Memory</b>	<p>This setting controls how much memory PHYLock will allocate to additional buffers. If you receive an error that says PHYLock failed to cache changes, try increasing this setting. Requires PHYLock version 2.</p>

# Backing Up Your System with Image for Windows

## Things to Consider Before Backing Up

If you will be using the PHYLock add-on program with Image for Windows, consider increasing the value of the PHYLock “Cache Size” setting. Refer to the PHYLock settings section on page 11 for more information.

There are few hard-and-fast rules to follow when formulating a backup plan. What follows, therefore, is intended more as a set of examples to spur thought, than as concrete rules to abide by.

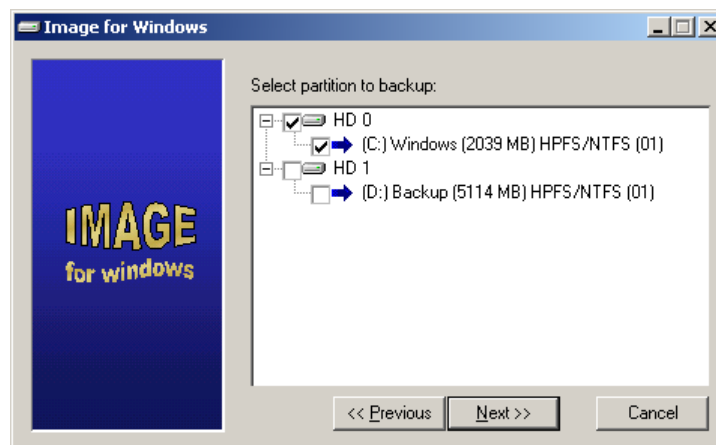
- Consider the destination for your backup. For example, if you will be backing up around 30-GB of data, you probably will not want to store the backup on a set of CD-R/RW discs, since the resultant backup will likely require 20 discs or more (based on an expected compression ratio of 40-60%). A better option in this case would be:
  - Backup to an alternate hard drive partition (and perhaps use the free add-on utility [BINGBURN](#) later to burn the backup to a set of DVD discs).
  - Backup to an external hard drive.
  - Backup directly to a set of DVD discs.
- Plan your backup with a restore strategy in mind. Some of your options are:
  - Save the backup directly to a set of bootable CD or DVD discs, as explained in this manual. To restore, simply boot with the restore disc, and use Image for DOS to perform the restore.
  - Save the backup to an alternate hard drive partition. To restore, run Image for DOS from a bootable floppy disk or CD/DVD disc. You can also use BootIt NG (a separate product offered by [TeraByte Unlimited](#)) to perform the restore.
- Strike your own balance between convenience and resiliency. Here are some simple ideas to consider:
  - Save your backups directly to an alternate hard drive partition, and then use the free utility [BINGBURN](#) to burn a secondary copy of the backup to a set of CD/DVD discs. Then, if you need to restore, you have the speed and convenience benefit of the backup stored on the hard drive. If things have really gone wrong and the primary copy of the backup is not available, you can fall back on the copy of the backup that has been saved on the CD/DVD discs.
  - Instead of always saving the backup to just one set of CD/DVD discs, keep two or more separate sets of backup discs, which will give you something to fall back on, if something should ever go wrong with the newest backup set.
  - If you are using multiple sets of backup CD/DVD discs, keep the newest set offsite, to guard against physical damage.

## Backing up with Image for Windows

1. If you would like the partition being backed up to be locked then be sure to close any open files on the drive you are going to be backing up. If you are unable to obtain a lock, and you know the partition is not in use, you can continue or consider using Image for DOS or the [PHYLock](#) add-on. (Refer to the Image for Windows settings for more details on PHYLock.)
  - Some virus-protection software will prevent a drive from being locked, even when real-time protection is turned off. Closing the anti-virus software temporarily may make it possible for the drive to be locked. However, using PHYLock in such a case is the preferred solution.
2. Run Image for Windows.
3. Make sure the **Backup** option is selected, and then click Next.

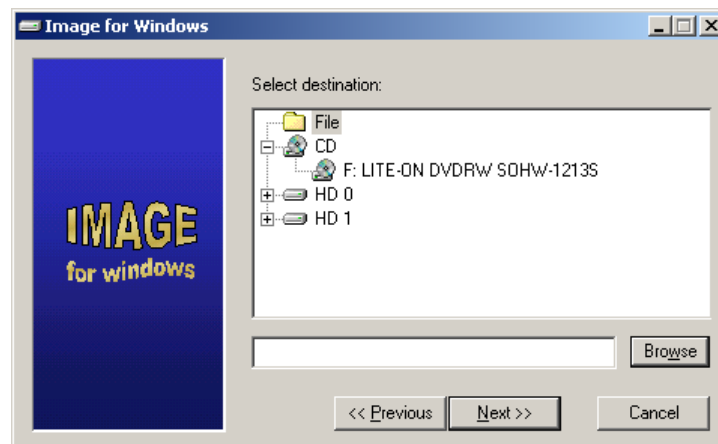


4. Select the check box(es) next to the hard drive(s) and/or partition(s) you want to back up, and then click Next.



- If you only see a blank window, you do not have Administrator privileges. You should start Image for Windows by right clicking its shortcut, choosing "Run as..." and selecting a user who has Administrator privileges.
- The partition list is displayed below the drive (in the above example, HD 0). The drive letter is shown at the beginning (C:), followed by a description (Windows), size (16371 MB) file system type (NTFS), and the partition ID (01).

5. Select the destination for the backup file(s), before clicking Next to proceed:
- Select File if you would like to save the backup file(s) to a folder on a hard drive which has a drive letter assigned to it by Windows.
    - If you are saving the image to a file, do not save it to the same partition you are backing up, unless you are using PHYLock. If you do, the restored partition will be in an inconsistent state, which can compromise reliability.
    - You can use the Browse button to navigate to the desired location, or manually enter the desired path and file name. You may specify UNC paths.
    - You do not have to supply a file extension—just the path and file name itself. The extension will be added automatically.
  - Select a listed CD or DVD drive if you would like to save the backup file(s) to a bootable CD or DVD disc.
    - Image for Windows can automatically overwrite CD-RW, and DVD+RW media. However, if you wish to use DVD-RW media, it must be either brand new, or fully blanked before being used. To fully blank the DVD-RW media, use your burning software's "full erase" function. (The "quick erase" function will not work for this purpose.)
  - Select a HD entry if you would like to save the backup file(s) to a hard drive that is listed there but has not been assigned a drive letter by Windows.



- Regardless of which backup destination you select, note that Image for Windows automatically creates backup files with the .IMG extension first, and then creates additional numbered files extensions as necessary. For example, if your backup results in three image files, they will be named BACKUP . IMG, BACKUP . 001, and BACKUP . 002, in that order of creation. How many image files are created depends on how large the source data is, whether compression is used, and what "Maximum file size" setting you use, as described in the next step.

6. Select the desired options for your backup. The options you are presented with depend on the destination you selected in the step above. The meaning of each option is described in the **Image for Windows Backup Settings** table that follows.

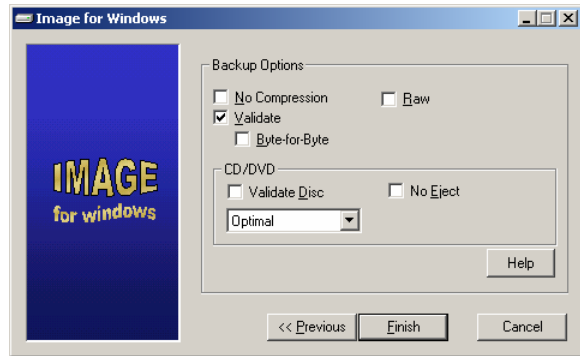
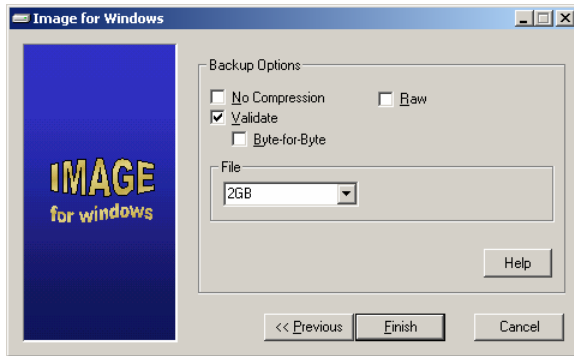
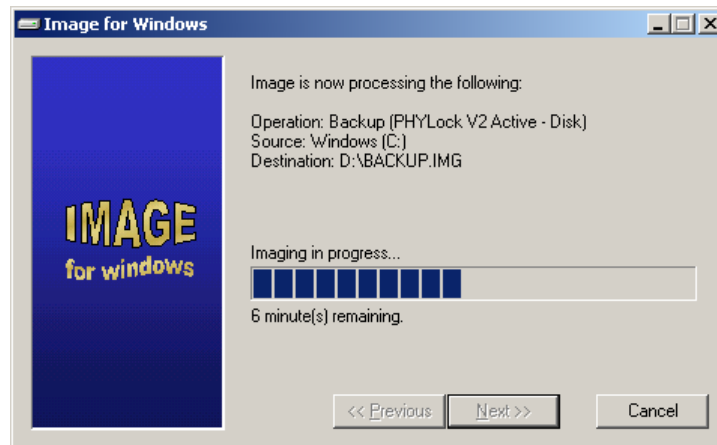




Image for Windows Backup Options	
<b>No Compression</b>	<p>This setting will result in a backup that is uncompressed. Enabling this setting may increase the speed of the backup operation, but may also increase the size of the resulting image file(s). If the source partition contains primarily files that do not compress well (e.g. media files such as MP3, JPG, AVI, etc.), then enabling this option may be beneficial, by speeding up the backup process.</p> <p>By default, Image for Windows uses maximum compression when performing backup operations. However, since the compression ratio depends on a number of factors—such as the number, size, and content of the files on the source partition, the level of file fragmentation, and so on—it is not readily possible to predict what level of compression can be achieved. However, compression ratios of 40 to 60% are typical.</p>
<b>Validate</b>	<p>This setting tells Image for Windows to perform internal consistency checks on the backup file(s), once they are created. Enabling this option increases the overall processing time, but can help ensure that the backup is reliable.</p> <p>The validation process can be cancelled while it is being carried out.</p>
<b>Byte-for-Byte</b>	<p>This setting is only available if the Validate setting is selected. Enabling a byte-for-byte validation forces Image for Windows to carry out an extremely thorough check of the backup file(s) that are created, to ensure 100% accuracy. This option generally doubles the processing time of the overall backup operation, but is advisable to use where maximum reliability is required.</p> <p>The byte-for-byte validation process can be cancelled while it is being carried out.</p>
<b>Raw</b>	<p>This setting instructs Image for Windows to backup all sectors of the source partition, rather than just used sectors.</p>
<b>File</b> (For Hard Drive Destinations)	<p>This setting tells Image for Windows how large the backup file(s) that are created can be. For example, if the backup ends up being 3.5GB in size overall, and you select the “2GB” option, Image for Windows will create one 2.0GB file, and one 1.5GB file, for a total of 3.5GB.</p> <p>You can enter any multiple of 512 bytes, from a minimum of 1MB, to a maximum of 2GB. Use “M” or “MB” and “G” or “GB” to indicate megabytes or gigabytes, respectively. For example, valid values are “5M” (5 megabytes), “512MB” (512 megabytes), “1536M” (1,536 megabytes), and “1G” (1 gigabyte).</p> <p>The 2GB maximum is in place to ensure maximum compatibility with the variety of operating systems and applications with which Image for DOS/Windows may be used.</p> <p>The “698MB” and “648MB” selections are intended to create backup files that fit on 700MB and 650MB CD-R/RW discs, respectively. You can use this option, for example, if you are saving the backup file(s) to a hard drive initially, and will later burn them to a CD using the free TeraByte Unlimited utility <a href="#">BINGBURN</a>.</p>
<b>Validate Disc</b> (For CD/DVD Destinations)	<p>This setting ensures that discs are readable after being written to, and verifies that the data on the disc appears to be the same as the data that was sent to the drive. Disc validation has the ability to detect media errors that may have occurred during the disc writing process. If an error is detected, you will be prompted to redo the failed disc. (Without this option enabled, you will only be notified of errors after the backup process is complete.)</p>
<b>No Eject</b> (For CD/DVD Destinations)	<p>This setting prevents the CD/DVD disc from being ejected when the backup is complete (<b>Note:</b> Under Windows NT/2000/XP/2003, the drive tray will open when the backup begins, but will close automatically).</p>
<b>Writing Speed</b> (For CD/DVD Destinations)	<p>This setting can be used to specify the maximum disc writing speed that Image for Windows will use (<i>not</i> the minimum). The maximum writing speed is also determined by the drive’s firmware and the media in use. For example, if you are using media that is rated at 8X, the maximum writing speed will be 8X, regardless of the setting you choose here. Please note that DVD speeds are approximately 1/8 CD speeds. Slower writing speeds can be used to increase reliability.</p>

7. Click **Finish**. The backup operation begins.
  - If the validation of a CD or DVD appears to hang, it may be due to problems trying to read the media. Try using a slower speed, or, failing that, different media and/or a CD/DVD drive firmware upgrade.



## Backing Up the System Partition with Image for Windows

If you attempt to backup the system partition without using PHYLock, you will be warned that the partition cannot be locked. You can ignore this warning and continue, however the only way you can be sure a partition being backed up is in a consistent state is by having it locked, or by using Image for DOS.

If you are using Windows NT/2000/XP/2003, you can use the PHYLock utility to maintain the consistency of the system partition to a "point in time." This means that once PHYLock becomes active during a partition backup, the state of the source drive is effectively frozen, with respect to the contents of the image. That is, no further changes to the source partition will be reflected in the backup, even if those changes occur while Image for Windows is performing the backup.

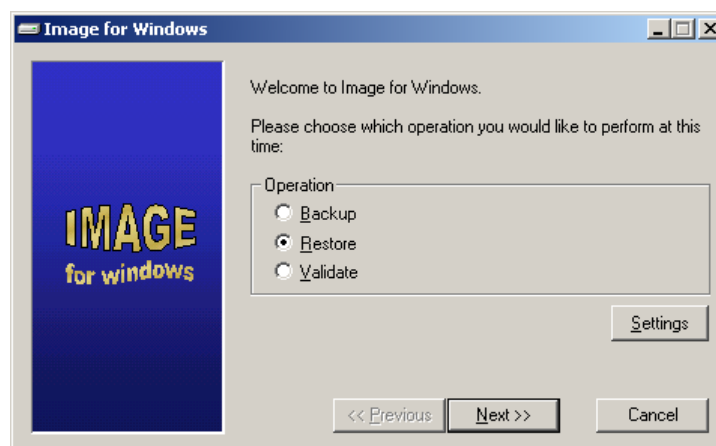
## Restoring from a Backup with Image for Windows

Please note the following, when preparing to perform a restore operation:

- When you are restoring an image, you cannot restore over the partition that contains the source image file.
- The restore target (whether a partition or an area of free space) must be large enough to accommodate the data from the source partition. The *minimal* amount of space required in the target is determined by the amount of space encompassed from the beginning of the source partition, to the last used area of the source partition. For example, if the partition backed up had 2 GB of data, and the last part of that data ended 15 GB from the start of the source partition, the target area would need to be at least 15 GB in size to accommodate the restore. This is true regardless of what the overall size of the source partition was.
- If the restore target (whether a partition or an area of free space) is larger than the source partition was, there will be an area of free space left over, unless the restore is performed via command line using the `x` parameter (as explained later in this manual).
- When you are booting from a restore CD/DVD, make sure the other CD/DVD drives do not also contain a bootable disc; otherwise the wrong CD/DVD drive may be used to boot.
- Since the hard drive order during the boot process may be different than it is while Windows is running, you may need to use the press a key when prompted, to access the interactive menu that will allow you to select the appropriate drive from which to restore.
- If you wish to restore your Windows partition, you cannot boot into that copy of Windows to perform the restore. You must instead run Image for DOS, and restore it from there.

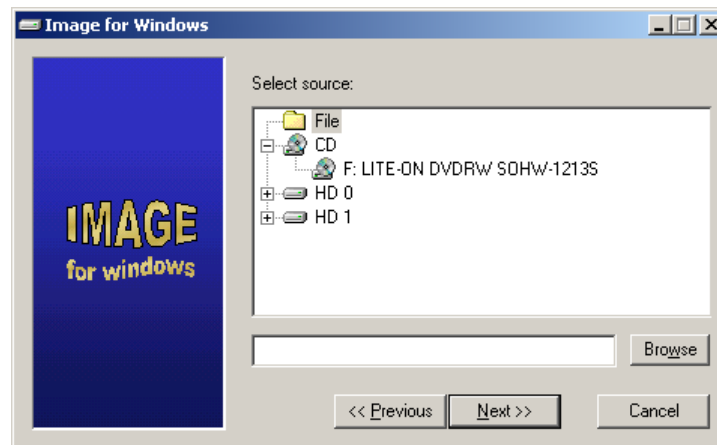
### Restoring with Image for Windows

1. Run Image for Windows.
2. Make sure the **Restore** option is selected, and then click Next.

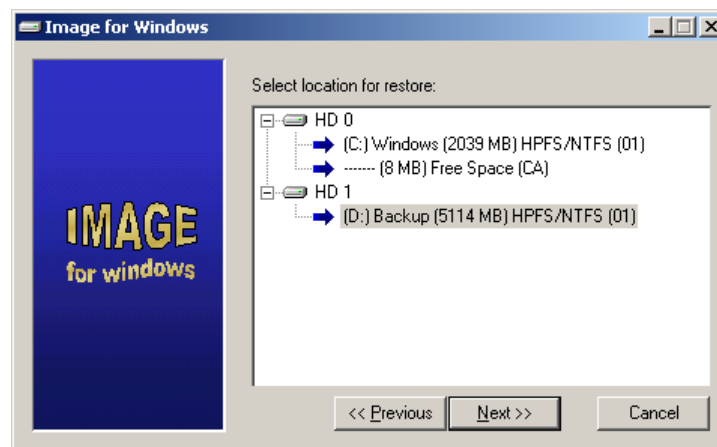


3. Select the source of the backup, before clicking Next to proceed:
  - Select File if you are restoring from backup file(s) that have previously been saved to a folder on a hard drive which has a drive letter assigned to it by Windows.
    - You can use the Browse button to navigate to the desired location, or manually enter the desired path and file name. You may specify UNC paths.

- Select a listed CD or DVD drive if you will be restoring from a backup that had been previously saved to a CD or DVD disc.
- Select a HD entry if you wish to restore from a backup that exists on a hard drive that is listed there, but has not been assigned a drive letter by Windows.



4. Select the destination to restore the partition to, and then click Next.



5. Select the desired options for your restore. The meaning of each option is described in the **Image for Windows Restore Options** table that follows.

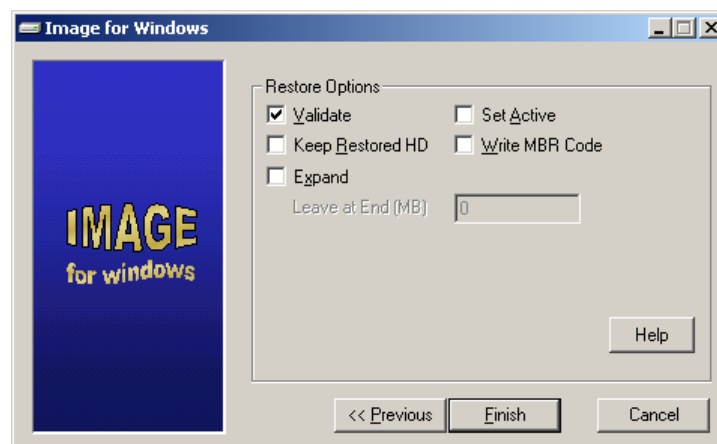


Image for Windows Restore Options	
<b>Validate</b>	This setting tells Image for Windows to perform internal consistency checks on the backup file(s), prior to the restore operation. Enabling this option increases the overall processing time, but can help ensure that the restore will be reliable.  The validation process can be cancelled while it is being carried out.
<b>Keep Restored HD</b>	This setting allows you to restore a Linux partition without changing the hard drive reference.
<b>Expand</b>	This setting applies only if you are restoring to a partition or free space entry that is larger than the source partition. If that is the case, this setting will instruct Image for Windows to <i>attempt to</i> increase the size of the restored partition to fill the size of the destination partition or free space entry (less the space indicated by the <b>Leave at End (MB)</b> setting, if any). The resulting sizes may not exactly reflect the value entered here. Also, please note that Windows 95/Me do not support FAT16 partitions over 2-GB in size.
<b>Leave at End (MB)</b>	This value only applies if the <b>Expand</b> setting is enabled, and instructs Image for Windows to leave the specified amount of free space, in MB, at the end of the restored partition, after expansion.
<b>Set Active</b>	If this setting is enabled, Image for Windows will set the restored partition active after the restore operation completes.
<b>Write MBR Code</b>	If this setting is enabled, Image for Windows will write a standard MBR after the restore operation completes (this is similar to FDISK /MBR).

6. Click **Finish**. The restore operation begins.

- If the selected destination for restore is a free space entry, the restore operation will begin immediately.
- If the selected destination for restore is an existing partition, you will first be warned that the existing data will be overwritten, and will be asked to confirm before proceeding.
- Once the restore process completes, reboot the computer if you are prompted to do so.
  - **Note:** If you do not reboot when asked, the operating system will think the partition and file system is as it was before the restore. This could cause data corruption. You can override the reboot prompt by using the `/RN` switch during a command line restore, but only do this if you are an advanced user, and understand the potential ramifications of not rebooting.



## Validating Backups with Image for Windows

Image for Windows provides you with the option to validate backups at the time of their creation, and also before any backup is restored. However, you can also perform this validation at any time afterward, using the instructions provided below.

Validating a backup causes internal consistency checks to be performed on the backup file(s). This can help ensure that the backup will be reliable, should you ever need to restore from it.

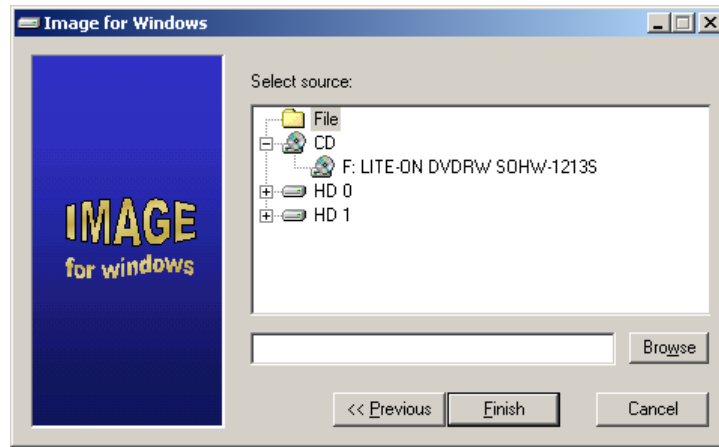
**Note:** A byte-for-byte validation can only be performed as part of a backup operation. That is, the Validate operation described here can only perform a standard validation, not a byte-for-byte validation.

### Validating a Backup with Image for Windows

1. Run Image for Windows.
2. Make sure the **Validate** option is selected, and then click Next.



7. Select the location of the backup to be validated, before clicking Next to proceed:
  - Select File if you are validating a backup that has previously been saved to a folder on a hard drive which has a drive letter assigned to it by Windows.
    - You can use the Browse button to navigate to the desired location, or manually enter the desired path and file name. You may specify UNC paths.
  - Select a listed CD or DVD drive if you will be validating a backup that had been previously saved to a CD or DVD disc.
  - Select a HD entry if you wish to validate a backup that resides on a hard drive that is listed there, but has not been assigned a drive letter by Windows.



8. Click Finish to begin the validation process. The validation process can be interrupted at any time by clicking the Cancel button.



## Deploying Your Image

Deploying an image means to restore it to a number of computers in an organization. Therefore, the information in this section does not apply to most home users.

Image does not change the SID of Windows NT/2000/XP/2003 systems. If you are using Image for deployment purposes and want to change the SID for Windows NT/2000/XP/2003, you should use the MS sysprep utility or you can download a free utility named NewSID,

You may want to set up the base machine so that the last partition ends at one track less than the actual end of the hard drive (around 8 MB less) to leave room for different brands or models of the same size hard drive.

You may also want to investigate the free [ImageAll](#) utility available from the [TeraByte Unlimited web site](#).

See the following for more information on how to prepare for deployment:

### **Windows XP:**

*How to Prepare Images for Disk Duplication with Sysprep*

<http://www.microsoft.com/WINDOWSXp/pro/using/itpro/deploying/duplication.asp>

*Windows XP Professional How-to Articles for IT Pros*

<http://www.microsoft.com/windowsxp/pro/using/itpro/default.asp>

### **Windows 2000:**

*Download for the Microsoft Windows 2000 Sysprep Tool*

<http://www.microsoft.com/windows2000/downloads/tools/default.asp>

*Deploying MS Windows 2000 Professional and MS Office 2000 Using Sysprep*

<http://www.microsoft.com/technet/prodtechnol/windows2000pro/deploy/depopt/sysprep.mspx>

*Using Sysprep to Duplicate Disks*

[http://www.microsoft.com/WINDOWS2000/techinfo/reskit/en/Deploy/dgcb\\_ins\\_izyl.htm](http://www.microsoft.com/WINDOWS2000/techinfo/reskit/en/Deploy/dgcb_ins_izyl.htm)

### **Windows NT:**

*Windows NT Workstation Deployment*

<http://www.microsoft.com/networkstation/technicalresources/deployment/default.asp>



## Running Image for Windows from the Command Line

You can run Image for Windows (IMAGEW.EXE) from the command line. Be sure to separate the command line options with spaces, and enter in the order shown in the following examples. Use the /? command line parameter for additional command line options not explained in the following section.

## Advanced Configuration

Image for Windows offers a number of advanced configuration options. These options may be specified in a user-created IFW.INI file, or using environment variables, specified on the command line or in a batch file. Some options may be specified using either method.

Please note that if a particular setting is specified in both the INI file and in an environment variable, the latter setting specified in the environment variable will take precedence.

Further explanation of the INI file format, and the use of environment variables, is provided below the following table of configuration options.

Option Name	Option Description	IFW.INI Examples	IFW Environment Variable
ATA	Image for Windows supports this option for creating a bootable CD/DVD disc that will cause Image for DOS to attempt directly accessing the IDE hard drive instead of using the system BIOS during a restore operation carried out after booting the disc.	ATA=0  ATA=1  (Must be 0 or 1)	SET IFW=ATA
CDCMZ	If you experience errors or problems when a CD is being closed, then you may need to use this option. (This option applies only to CDs, not DVDs.)	CDCMZ=0  CDCMZ=1  (Must be 0 or 1)	SET IFW=CDCMZ
CDRS	Sets the CD/DVD read speed. For example: CDRS : 8 sets the read speed to 8X. These speeds are CD-based; multiply by 8 to approximate DVD speeds (e.g. to read a DVD disc at 2X, use CDRS : 16).	CDRS=4  CDRS=8	SET IFW=CDRS : 8
CDWS	Sets the CD/DVD write speed. For example: CDWS : 8 sets the write speed to 8X. These speeds are CD-based; multiply by 8 to approximate DVD speeds (e.g. to burn a DVD disc at 1X, use CDWS : 8).  <b>Note:</b> If you are having problems burning a reliable CD/DVD, you may need to slow the write speed down using this option.	CDWS=4  CDWS=8	SET IFW=CDWS : 4
IAR	Image Auto Response value. Set this to Y or N to auto respond to 'Y'es or 'N'o prompts and error messages. You can use errorlevel in a batch file to determine if the operation was successful or not.  To respond to the "Unable to obtain a lock -- Abort/Ignore/Retry" message, set the second character of the IAR option to either R, A, or I. For example, IAR=YI (if using the INI file) or IAR : YI (if using environment variables).  <b>Note:</b> If you use the "R" setting, the program will appear to be imaging without making progress while it tries to obtain a lock. You will need to click Cancel to stop it. If you would like to only respond to the lock message, set the first character of IAR to something other than Y or N (for example, IAR : x). You can use errorlevel in a batch file to determine if the operation was successful or not.	IAR=Y  IAR=YI	SET IFW=IAR : Y
IBXT	Using the Burn Extra Track option saves you from having to insert the last CD/DVD of an image set at the beginning of a restore operation. <b>Note:</b> This option may not work with all CD or DVD drives.	IBXT=0 IBXT=1  (Must be 0 or 1)	SET IFW=IBXT
IGNVLAB	Ignores the use of volume labels. This can be useful when using ImageAll with an EMBR where you want the MPT entry names to stay the same.	N/A  (Setting is available through the IFW interface)	N/A  (Setting is available through the IFW interface)

Option Name	Option Description	IFW.INI Examples	IFW Environment Variable
SEQVOLID	<p>This option only applies to volumes within an extended partition. When enabled, the SEQVOLID option allows you to specify the volume to be backed up to—or restored over—using sequence numbers, rather than the actual volume ID. The sequence numbers must be specified in hexadecimal form, and are determined by the order of the volumes within the extended partition, beginning at 1.</p> <p>To determine what volume ID to use with this option, first enable the option, and then use the interactive method, as described under the section of this manual describing command line usage.</p>	<p>SEQVOLID=0</p> <p>SEQVOLID=1</p> <p>(Must be 0 or 1)</p>	SET IFW=SEQVOLID

## Image for Windows INI File

In order to apply settings to Image for Windows using the INI file, you must create a text file named `IFW.INI`, using a text editor such as Notepad. Image for Windows will look for `IFW.INI` by examining the current directory, the Windows directory, and the system/user path (in that order). Usually, the current directory will be the same path where `IMAGEW.EXE` is located.

All settings specified in `IFW.INI` must go in a section titled `[options]`. Please refer to the example `IFW.INI` content provided below:

```
[options]
ATA=1
CDRS=32
```

## Image for Windows Environment Variables

Image for Windows makes use of environment variables with the command line interface only. That is, if you do not also use command line parameters when invoking `IMAGEW.EXE`, the environment variables will be ignored.

The format for Image for Windows environment variables is:

```
SET IFW=option1;option2:value;option3
```

As shown above, the `SET` command is used to establish Image for Windows environment variables. An example of batch script Image for Windows invocation from Windows NT/2000/XP/2003 is as follows:

```
setlocal
set IFW=ATA;CDWS:2
start "" /wait "<path>\imagew.exe" /c00x11 /cd0
endlocal
```

For Windows 95/98/Me, you would use this batch file content instead, which is functionally equivalent to the example above:

```
set IFW=ATA;CDWS:2
start /wait "<path>\imagew.exe" /c00x11 /cd0
set IFW=
```

In each case, this would backup partition ID 0x11 on hard drive 0 (`/c00x11`), and save the image to the CD/DVD drive number 0 (`/cd0`). It would also enable the `ATA` option for any future restores carried out after booting with the CD/DVD created, and set the CD/DVD write speed (`CDWS`) to 2X (`CDWS:2`). (Command line options are explained below.)

## Displaying a List of Environment Variables Currently in Effect

At the command line, enter the `set` command with no parameters:

```
set
```

## Removing an Environment Variable

At the command line, enter the `set` command with no value. The following example removes “varname” from the environment:

```
set varname=
```

# Image for Windows Command Line Options

## Image for Windows Command Line Options

All available command line options can be viewed by running `IMAGEW.EXE` followed by the `"/?"` parameter, as follows:

```
imagew.exe /?
```

If you will be using a batch file, you should start the process using the `start` command:

```
start /wait "<path>\imagew.exe" [options] (Windows 9x/Me)
```

```
start "" /wait "<path>\imagew.exe" [options] (Windows NT/2000/XP/2003)
```

To run the program as a different user under Windows 2000/XP/2003, use the `runas` command:

```
runas /user:Administrator "<path>\imagew.exe" [options]
```

You can also use the Task Scheduler, the Windows service that schedules tasks. With Windows NT/2000/XP/2003, you may want to use something like `SRVANY` (included with the NT resource kit) and run it as a service under an appropriate profile.

When running Image for Windows from the command line, you may need to include references to hard drive numbers, and/or partition IDs. To determine the correct hard drive number or partition ID, run Image for Windows, select the Backup option, and then click Next. Image for Windows will then show a window that lists all available hard drives and partitions. The hard drive number will appear in the format "HD n" (e.g. "HD 0" or "HD 1"). The partition ID is shown in parenthesis on the right side of each partition description, and may consist of either two or four characters. The following image depicts "HD 0" and partition ID 01:



**Note:** Under certain configurations, hard drive numbers may be different in Windows than they are in DOS or other environments.

Image for Windows command line options are detailed in the table that follows.

Image for Windows Command Line Options: Backup			
IMAGEW /Chp[[V VB][J][R][W]] [/U] /CDn d:\file.img hp:\file.img[;s]			
Create Image	Option		Explanation
	Required Parameters		
	/Chp	/Chp	<b>h</b> is source hard drive number (0 through 9) <b>p</b> is source partition ID
	/CDn		Save to CD/DVD drive "n"
	d:<path>\<file>		Save to drive letter "d"
	hp:<path>\<file>		Save to destination hard drive number "h" and partition ID "p"
	Optional Parameters		
	/U		No compression when creating image
	V		Validate the image after creating
	VB		Validate the image byte-for-byte after creating
	J		Do not eject the CD/DVD disc when the backup is complete ( <b>Note:</b> Under Windows NT/2000/XP/2003, the drive tray will open when the backup begins, but will close automatically)
	R		Perform per-disc validation (only applicable when saving to CD/DVD)
	W		Use raw mode (backup all sectors, rather than just used sectors)
	:[max file size]		Added to end of <path>\<file> to specify max backup file size:
		0	Maximum backup file size 2.0 GB (the default if omitted)
		1	Maximum backup file size 698 MB
		2	Maximum backup file size 648 MB
		Msize	Custom maximum backup file size: size MB (2047 Max)
Usage Examples			
<b>imagew.exe /C20x4VB /U E:\BACKUPS\WINDOWS;1</b> Backs up hard drive number 2, partition ID 0x4 (/C <b>20x4</b> VB) Saves to drive letter E:, under path and file name "BACKUPS\WINDOWS" (E:\BACKUPS\WINDOWS;1) Performs byte-for-byte validation (/C20x4 <b>VB</b> ) Uses no compression (/U) Maximum file size will be 698 MB (E:\BACKUPS\WINDOWS; <b>1</b> )			
<b>imagew.exe /C10x5V /CD1</b> Backs up hard drive number 1, partition ID 0x5 (/C <b>10x5</b> V) Saves to CD/DVD drive number 1 (/CD <b>1</b> ) Performs standard validation (/C10x5 <b>V</b> ) Uses compression (the default) Maximum file size will be determined by destination CD/DVD media			
<b>imagew.exe /C00x1JR /CD2</b> Backs up hard drive number 0, partition ID 0x1 (/C <b>00x1</b> JR) Saves to CD/DVD drive number <b>2</b> (/CD <b>2</b> ) Will not eject the CD/DVD disc when the backup is complete (/C00x1 <b>J</b> R) Performs per-disc validation (/C00x1 <b>J</b> R) Uses compression (the default) Maximum file size will be determined by destination CD/DVD media			
<b>imagew.exe /C00x1 10x1:\DATA01\BACKUP</b> Backs up hard drive number 0, partition ID 0x1 (/C <b>00x1</b> ) Saves to hard drive number 1, partition ID 0x1, and path/file name "DATA01\BACKUP" ( <b>10x1:\DATA01\BACKUP</b> ) Performs no validation (the default) Uses compression (the default) Maximum file size will be 2.0 GB (the default)			

## Additional Notes on Image for Windows Command Line Backups

- For most users, the partition ID will be a number from 1 through 4. For partition IDs of 9 or below, a single digit may be used in place of hexadecimal notation (e.g. 1 is equivalent to 0x1, and 5 is equivalent to 0x5).
- Volumes will be a number formatted as 0xPVV where P is the extended partition and VV is the volume number in hexadecimal from 01 to FF.
- If you are not sure what the partition or volume ID is, run Image for Windows without any parameters, choose the Backup option, and click Next. The screen that lists the partitions and volumes also will display the ID in parentheses as a hexadecimal number. You should prefix that number with a 0x on the command line, as shown in the examples above.
- Per-disc validation is only applicable when saving images to a CD or DVD drive. This option ensures that discs are readable after being written to, and verifies that the data on the disc appears to be the same as the data that was sent to the drive. Per-disc validation has the ability to detect media errors that may have occurred during the disc writing process. If an error is detected, you will be prompted to redo the failed disc. (Without this option enabled, you will only be notified of errors after the backup process is complete.)

## Creating a Bootable CD/DVD Restore Disc

As long as the file `CDBOOT.F35` is in the same directory as `IMAGEW.EXE`, a bootable CD/DVD will be created when burning directly to a CD/DVD drive. However, the `CDBOOT.F35` file will only be able to restore from an ATAPI CD/DVD drive on one of the IDE controllers. If you would like to restore from another device, you will need to create your own diskette image with the appropriate ASPI drivers and `AUTOEXEC.BAT` file to execute the image restore.

- This only applies when booting the CD/DVD created with `CDBOOT.F35`. You will be able to restore from other CD/DVD drives under Windows.

Image for Windows Command Line Options: Restore		
IMAGEW /R[[hd][id][J][N][T][V][A][X Xmb][Z][M]] [/O /C /CR] /CDn[file] d:\file.img hp:\file.img		
Restore Image	Option	Explanation
	Required Parameters	
	/R	Indicates that a restore operation is to be performed
	/CDn[file]	Restore from CD/DVD drive “n” (specifying [file] is optional)
	d:<path>\<file>	Restore from drive letter “d”
	hp:<path>\<file>	Restore from source hard drive number “h” and partition ID “p”
	Optional Parameters	
	[hd]	Destination hard drive number (0 through 9)
	[id]	Partition ID that will be overwritten by the restore <ul style="list-style-type: none"> <li>Hex notation (e.g. 0x6A) may be used if the partition ID (in hex) does not conflict with recognized command line options</li> <li>Decimal notation may be used in all cases</li> <li>If [id] is used, [hd] must also be present</li> </ul>
	/O	Overwrite existing data without warning (advanced users only) Cannot be used with /C or /CR options
	/C	Clear MBR and EMBR before restore (advanced users only) Cannot be used with /O option
	/CR	Clear MBR and EMBR, and restore NT signature (advanced users only) Cannot be used with /O option
	J	Do not eject the CD/DVD disc when the restore is complete ( <b>Note:</b> Under Windows NT/2000/XP/2003, the drive tray will open when the restore begins, but will close automatically)
	N	Suppress prompt to reboot after restore (advanced users only)
	T	Write standard MBR after restore (similar to FDISK /MBR)
	V	Validate the image before restoring
	A	Set the restored partition active
	X	Expand the restored partition to fill leftover free space, if any
	Xmb	Expand the restored partition to fill leftover free space, if any, minus the number of megabytes specified by “mb”
	Z	Restore a Linux partition without changing the hard drive reference.
	M	Restore to the first block of free space on the destination drive that is large enough to accommodate the restored partition
Usage Examples		
<b>imagew.exe /R00x6AVAX "D:\System Backups\Monthly01"</b> Restores to destination hard drive number 0 (/R <b>00</b> x6AVAX) Restores over the partition with ID 0x6A (/R <b>00x6A</b> VAX) <ul style="list-style-type: none"> <li>Converting the partition ID 0x6A to decimal notation, 106, would also work (/R<b>0106</b>VAX)</li> </ul> Restores from backup source "D:\System Backups\Monthly01" (quotes required for long file name) Provides overwrite confirmation (the default) Will not suppress reboot prompt (the default) Will validate the backup before performing the restore (/R00x6A <b>V</b> AX) Will not clear the MBR, EMBR, or NT signature (the default) Will set the restored partition active (/R00x6AV <b>A</b> X) Will expand the restored partition to fill leftover free space, if any (/R00x6AVAX <b>X</b> )		
<b>imagew.exe /R /O /CD2backup</b> Restores over the same hard drive and partition that was originally backed up (because [hd] and [hd][id] options are not used) Restores from CD/DVD drive number 2 (/CD <b>2</b> backup) Restores the file named “backup.img” (/CD2 <b>backup</b> ) on CD/DVD drive number 2 Does not provide overwrite confirmation ( <b>/O</b> ) Will not suppress reboot prompt (the default) Will not validate the backup before performing the restore (the default) Will not clear the MBR, EMBR, or NT signature (the default) Will not set the restored partition active (the default) Will not expand the restored partition to fill leftover free space, even if present (the default)		

**imagew.exe /R1NV 10x1:\BACKUPS\MARCH**

Restores to destination hard drive number 1 (/R**1**NV)

Restores from hard drive number 1, partition ID 0x1, and path/file name "BACKUPS\MARCH" (**10x1:\BACKUPS\MARCH**)

Provides overwrite confirmation (the default)

Will suppress reboot prompt, even if reboot is required (/R**1**NV)

Will validate the backup before performing the restore (/R**1**N**V**)

Will not clear the MBR, EMBR, or NT signature (the default)

Will not set the restored partition active (the default)

Will not expand the restored partition to fill leftover free space, even if present (the default)

## Additional Notes on Image for Windows Command Line Restores

- The restored partition will go to the same hard drive number (unless overridden) and physical location on the drive as it was backed up from.
- If the source partition was a volume and there is now no extended partition at the original location, Image for Windows will attempt to create the original extended partition. If Image for Windows cannot create the extended partition, it will be restored as a primary partition.
- If the source partition was originally a primary partition, and an extended partition now encompasses that location, it will be restored as a volume.
- If an existing partition or volume occupies the same starting location as the partition to be restored, a warning message will be issued before overwriting that partition or volume. (Unless this warning message is suppressed, as described in the table above.)

Image for Windows Command Line Options: Validate		
IMAGEW /V /CDn d:\file.img hp:\file.img		
Validate Image	Option	Explanation
	Required Parameters	
	/V	Indicates that a validation operation is to be performed
	/CDn	Validate backup on CD/DVD drive "n"
	d:<path>\<file>	Validate backup on drive letter "d"
Validate Image	hp:<path>\<file>	Validate backup on source hard drive number "h" and partition ID "p"
	Usage Examples	
	<b>imagew.exe /V "D:\System Backups\Monthly01"</b>	
	Validates the backup file "D:\System Backups\Monthly01" (quotes required for long file name)	
	<b>imagew.exe /V /CD1</b>	
	Validates the backup mounted on CD/DVD drive number 1 (/CD <b>1</b> )	
	<b>imagew.exe /V 20x3:\BKUP</b>	
	Validates the backup file on hard drive number 2, partition ID 0x3, and path/file name "BKUP" ( <b>20x3:\BKUP</b> )	



# Glossary

## Hard Drive (HD, HDD)

A high-capacity, non-volatile, data storage device. Hard drives are typically installed inside a computer, out of sight.

## Partition

A unique area of a hard drive that is allocated for use by a file system. A hard drive can contain many partitions.

## File System

An organized structure that allows data to be stored and accessed by a file name. You can basically think of it as the filing system used by the operating system to store and retrieve your data. On a hard drive, the file system almost always resides in a partition.

## Volume

Generally, this refers to any file system or device that is used to hold data, but here it also represents a specific partition that resides in an extended partition.

## Extended Partition

A special type of partition that is divided in to one or more partitions called volumes.

## Drive Letter

A single letter that represents a file system in Microsoft operating systems. Since a file system on a hard drive is almost always in a partition or volume, it also represents a partition or volume.

## Logical Drive

A term used in Microsoft operating systems to describe the specific drive letters that point to volumes. In practical terms, it is the same thing as a drive letter.

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