



FOOLPROOF BURNING CD'S & DVD'S

An Outline and Tutorial of Burning Basics.

A Presentation by: Erin Varao



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An Outline and Tutorial of Burning Basics.

- Overview of the “Disc” Format



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 - CD Burning Overview



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 - New Media Technology



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 - Tips & Tech Resources



An Overview of the “Disc” Format



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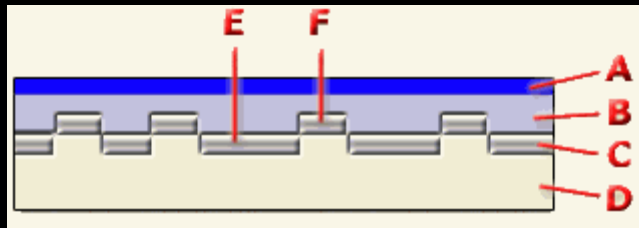
ANATOMY OF THE DISC

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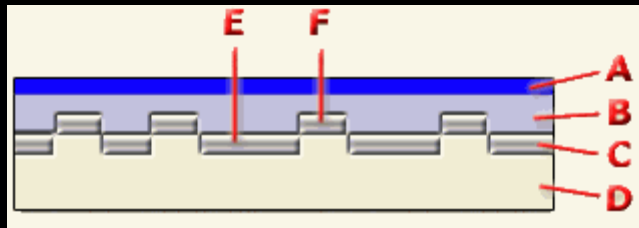


- A:** Label Layer **B:** Protection Layer **C:** Data Layer
D: Protection Layer (Transparent) **E:** Logical 0
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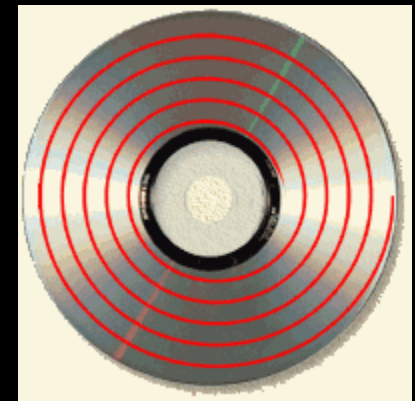
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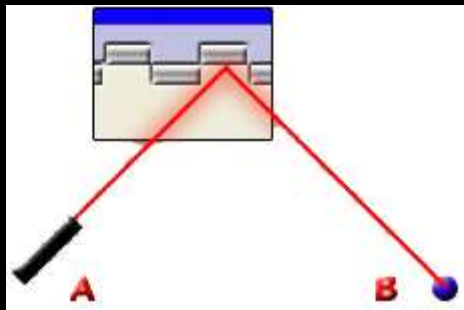
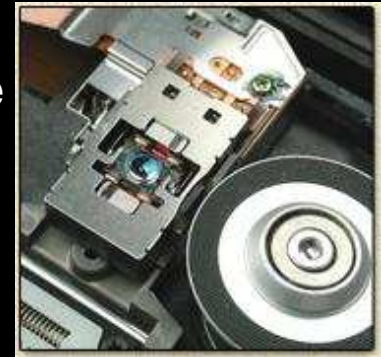
- A different feature of a CD is the so called Track (helix) on the disc. Basically this is the track followed by the laser and its sensor. This works similar as the good old record-player, the needle moves through a groove (the track) until the end of the groove has been reached.



An Overview of the "Disc" Format

HOW IT ALL WORKS

- The combination of laser and sensor, the "head", moves from the center of the disc to the outside of the disc.
- In case the disc would spin at a constant speed, the laser would come into trouble. The amount of passing pits and bumps is much greater at the outside of a CD compared to the centre of the CD. To get things working properly, the so called bitrate (the amount of passing bumps and pits) must be constant. To achieve this, the spin-speed of a disc changes as the head moves close to the outer side of a CD.



- All Hardware uses a laser, but one of the features of light is that it travels straight forward. Light can also be reflected, one of the rules in is that, light that has been reflected, uses the same angle for both incoming and outgoing light.



FORMATS & MEDIA

A Brief Overview of the Different Types of Media Available Today.

- **CD'S**: The 2 most common formats of CD'S are the CD-R and the CD-RW. Both contain the same amount of storage space 700mb but the RW carries the feature of “re-writing” the ability to delete and re-write onto the disc itself.



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- **DVD'S**: The DVD ushered in a revolutionary media format with the capability of 4.7gig of storage space. There are also more choices within the format DVD+R, DVD-R, DVD+RW, DVD-RW, Dual Layer and the Double sided Dual Layer ranging from 4.7 to a tremendous 18gb in storage space. Of course with the many selections also come many restrictions as far as writers and readers.



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- **Blu-Ray & HD-DVD:** Much like the DVD utilizing different hardware the next generation of media are these two formats. Blu-Ray which is developed by Sony boasts a amazing 50gb worth of space. The HD-DVD supports up to 30gb worth of space. The two formats are in an “infant” stage right now. Until a clear “winner” is decided the format remains un-cost effective and difficult to use for purposes other than movies.

CD BURNING OVERVIEW

A Basic Guide and Overview of Burning on the CD Format



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INTRODUCTION:

- **HARDWARE & SOFTWARE NEEDS:** For Compact Disc burning you need a “Writable” CD drive on your PC or laptop. These drives are marked with either the Writable or the ReWritable logo on the drive. These drives give you the ability to write (burn), read and in some cases erase CD’S. You will also need software there is a multitude of software to choose from all with different bells and whistle, free to the expensive.

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- **MEDIA NEEDS:** There are different media types for what you want to accomplish in a CD burn. The two formats that I stated earlier have different compatibilities for different uses. The CD-RW always sounds better than the CD-R for the erasing capability, but there is a limit to the amount of ReWriting these discs can handle. The CD-RW is optimal for Data writing and archiving but not for media, Photos, Video, Music etc. Media discs that you burn for use in other devices should be using the CD-R most of the media players out there today do not support the “RW” media due to its formatting such as car CD player, DVD players etc.

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- **ISO:** An ISO is a "Disc Image" short for ISO 9660 an international standard originally devised for storing data on CD-ROM. More loosely, it refers to any optical disc image, even a UDF (Universal Disc Format) image. It also contains all the file system and metadata, including boot code, structures, and attributes. All of this information is contained in a single file. The common uses for the format is the distribution of almost all software and the ease of Internet transmission for downloading data and burning it onto a disc.

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- **BOOT:** The CD-ROM (Boot) format is exactly how it sounds. It is a format that utilizes the ISO format but contains a "Boot" track. The Boot track is essentially a command prompt built into the disc that allows the ISO file to run as soon as the disc is placed into the drive. Any Disc that does not contain a boot file or that is not burned in a boot format will not automatically run the ISO. In most cases the operating system will open an explorer option for you to access what is on the disc. With today's technology writing your own boot file has become a thing of the past with most if not all software giving you the option to add a boot file format to the disc.

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- **MULTISESSION:** The multisection is not a disc format but more of an option to a burn process. What this option does is that it allows the user to keep a burn session open on the disc. In all cases when you burn a disc no matter if you use 100 or 700mb the disc is complete and can NOT be written to again unless erased if the disc is an RW. The multisection allows you to use only what you need on a disc so if you only need to use 100mb you can still write to the other 600mb later.

Unfortunately this option is for the most part unusable. The multisection option is not recognized in almost all cases. A multisection disc cannot be read by another machine. This is because the software creates a log that is independent to the disc so that it knows where the session ended and where to begin again.

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- **AUDIO:** With the advancement of DVD technology CD's are becoming more sparse in use. But the Audio disc is one that is still widely used with most audio players only reading CD's and not DVD's. There are two major formats for an audio disc "Audio CD" and "MP3 CD" the difference between the 2 is the format of the actual audio files on the disc. The "Audio CD" uses a universal format for the audio tracks. These tracks are usually large depending on the length of the audio ranging from 35-50mb. But these files are more universal in audio players.

The MP3 formatted disks allows the use of file browsing and metedata with the audio tracks ranging from 2-10mb. But the audio device must support the MP3 format. This format is becoming more widely used.

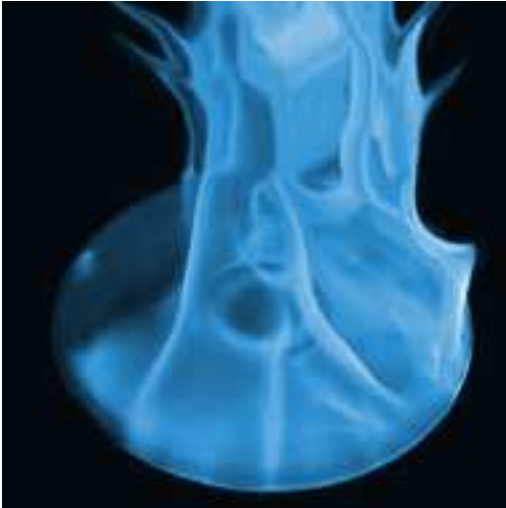
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- **VIDEO:** For the video media the CD is usually not the first option. With video files being quite large and the bit rate on a CD quite low the CD is not the optimal choice burning video media. Although in some cases with short videos such as home videos shot at a lower resolution the CD is a great cost effective option for archiving video media. There are 2 main formats for burning video onto a CD VCD (video CD) and the SVCD (Super Video CD). The difference between the 2 is the quality the SVCD allows a higher resolution and sound quality but at a loss of play time the SVCD usually contains 30-40 min. of video. The VCD is for lower quality recordings usually with a mono audio track and is burned at a MPEG1 format but the format allows up to a full 74 min. of video. Much like the VHS days of SP, LP and SLP.



DVD BURNING OVERVIEW

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INTRODUCTION:

- **HARDWARE & SOFTWARE NEEDS:** For DVD formats a DVD Writer is needed, all DVD writers that are now produced are compatible with the + and - R's. Much like the CD writers the DVD writers are either R or RW. But there are some other aspects some writers are dual layer. The dual layer aspect are for the DVD9's which have the storage capacity of 9-18gb. Most if not all DVD writers will be labeled accordingly to what you are looking for.



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- **MEDIA NEEDS:** The choices for blank DVD media is a bit overwhelming and sometimes confusing to say the least. The most common choices will be the DVD+R & RW and the DVD-R & RW Once again as stated before the difference is in the external use of the disk. The most important thing when choosing a blank DVD media is to make sure that it is compatible with your writing hardware and that it meets your needs. There is no need to spend large amounts of money for Dual Layer media if you do not have the writer.



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- **DVD BURNING FORMATS:** There are many choices to utilizing the DVD format, from backing up DVD movies to archiving data and media. The DVD retains the uses of the CD & much more. Once again I will try to cover the most common.



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- **DATA DVD:** Much like the CD the DVD can be used for data as well with the exception in storage size of course. Due to the size of the disc the DATA DVD differs from the CD in some ways. The DATA DVD is capable of retaining metadata for example you can place a file tree or an integrated search sequence within the DVD some programs offer archiving programs with search features and much more information.

Some users also use DVD's for OS backups or system image restoring files. This has proved to be a cost effective tool in archiving and maintaining data.



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- **AUDIO DVD:** Again like the CD the DVD can also be used for audio purposes retaining the same uses of the CD. But at a much greater quality but at the same time with less compatibility than its CD counter part. The Audio DVD supports almost all formats of audio from the stereo WAV to the 5.1 Dolby experience. The Audio DVD is exceptionally large format to keep or enjoy your audio files.



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- **DVD VIDEO:** The options for the DVD Video are vast to say the least the media is capable of handling all formats of videos for just about any device in today's market. The format of the DVD video could range from a simple AVI file to an advanced DVD with animated menus, multiple languages, multiple types of audio streams and much more. The DVD has the capacity to meet just about any video need. With the correct software you can also use DVD's to record live TV through your PC.

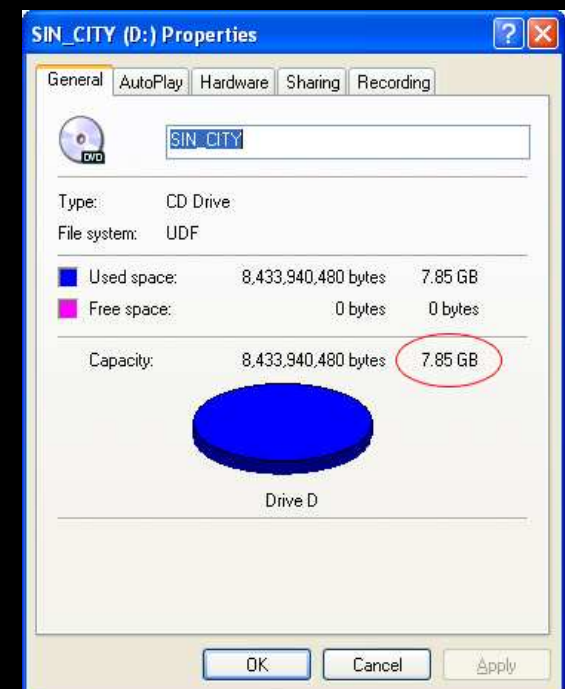


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- **BACKING UP DVD VIDEOS:** The most common question I receive about DVD media is about backing up DVD's. Most programs out there today do not recognize a fully formatted DVD or the program sees the disc but the capacity is above 4.7gb that cannot fit onto a black DVD media. It is possible to backup to a dual layer DVD but this version of the media is still costly.





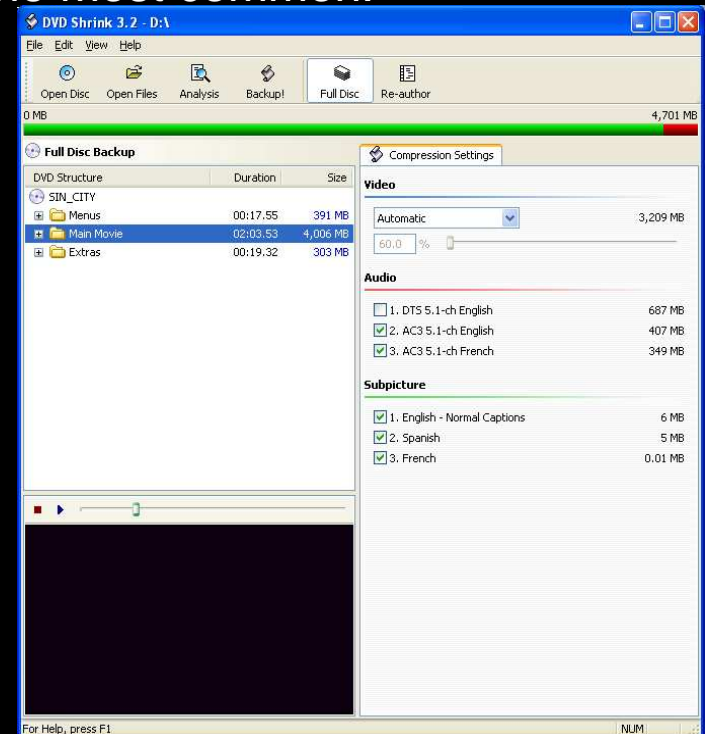
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• **BACKING UP DVD VIDEOS:** Most if not all formatted Video DVD's will come this way it is what is called an over burn or an over buffering of the formatted DVD. It is blank data that has been over burned on top of the disc that serves no purpose. There are a multitude of programs that can re-format these formatted DVD's back to its original file state for you to store onto your HD or to burn onto a blank disc. Here is a screen shot of the program DVD Shrink it is a free program that breaks down the file so that you can re-use it.



NEW MEDIA TECHNOLOGY

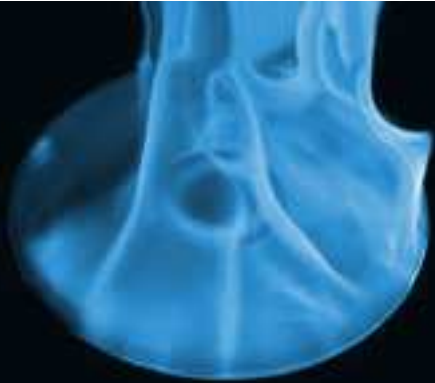
A Basic Guide of the Upcoming Media



- **NEXT GENERATION DISC MEDIA:** Today we are starting to see the emergence of the next generation in DVD format media Blu-Ray and HD-DVD. These 2 formats are competing to be the next media of choice. With astounding storage capacity up to 50gb and tremendous bit rate speed this new media will be the next standard. Currently being utilized for home entertainment this technology will hopefully see other uses in the near future.



- **LIGHTSCRIBE:** With the pressing need for disc labeling and conventional methods proving to be costly and damaging to hardware Lightscribe has been introduced. This technology uses the laser already in your writer to apply images and text to the surface of Lightscribe disc. These discs come with a special layer much like the heat transfer paper of old which is used to create the image on the disc. Lightscribe produces disks for all disc media from CD's to DVD's.



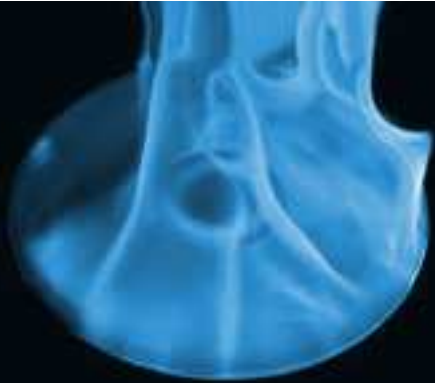
TIPS & TECH. RESOURCES

Some Helpful Tips and Resources



BURNING TIPS:

- Always burn one speed lower than the disc's maximum speed for best results. (If the disc states 16x set your burner for 12x for the best result.)
- Never burn in Multisession unless you the disc is only going to be used on that particular machine.
- Never interrupt a burn in process it will ruin the entire disc and cannot be used again.
- Try to keep work on the machine that is burning to a minimum a burn process does take a lot of horsepower work can interfere with a burn.
 - Blank media is more fragile than processed media after the burn the once blank media has less protection.
- Never place stickers or labels on Discs this may ruin the next drive you place the disc into.



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TECH RESOURCES:

- **AFTERDAWN.COM:** A great site that provides many tutorials, definitions, software and a great forum for a lot of needs!
- **DVD SHRINK:** A great freeware that can read and recompress formatted DVDS.
 - **ASHAMPOO BURNING STUDIO:** A great freeware that has a lot of compatibilities and burning tools.
 - **DVD FAB:** A great one click clone program.
- **CONVERTX TO DVD:** A program that converts all video files into DVD formatted files IE: Windows AVI to DVD Format.