

• Music Files for your Music Server

There are several ways to get music into your music server. Two ways are relatively simple: You can buy and download files from various websites. Or you can transfer by simply dragging the files from a disc such as a DVD data disc to your hard drive or SSD. (Note: The latter is how the Reference Recordings HRx files were first made available.)

Alternatively you can rip music files from your CD collection. In addition it is possible to get music from other disc types such as DVD Video, DVD-A, SACD, or Blu-Ray. Note that some of these discs are copy-protected so they are not supposed to be copied. The lawmakers and lawyers can debate the fine points of "Fair Use" and this has already been going on for decades. However for personal use many people are taking their library of silver discs and attempting to get their music into their music servers with varying degrees of success in terms of file music quality as well as metadata accuracy and completeness. Additional aspects that some may consider to be of importance include the size and quality of cover artwork as well as the inclusion of liner notes.

Note that copyright laws for music recordings vary from country to country. Here in the US the copyright for a music recording extends to 70 years from the copyright date whereas it is 50 years in some European countries. Also here in the US you might be interested to know that Section III of the proposed 2007 [Fair Use Act](#), which would amend the DMCA, allows for circumvention for the purpose of storing or transmitting media over a personal network, but explicitly prevents the uploading of media "to the Internet for mass, indiscriminate redistribution."

Ripping & Transferring Music from CD's to a Music Server

Extracting music from your CD's and transferring the files to your computer or music server can be rather time consuming, assuming of course that you care about sound quality and you wish to do a good job—and if you listen to classical music it can be especially time consuming. So if you would like to set up a music server but don't want to spend the time necessary to get your CD library transferred you can simply call us and we will take care of getting it done for you. The cost for professional music transfer from CD to hard disk is delineated [here](#).

However if you have a large collection and wish to devote untold hours to doing so yourself some suggestions follow:

Inspecting your Discs

First it is recommended that you inspect the playing surface to see if there are any dirt, scratches, or plating defects. Even new CD's can come out of the box either with minor scratches and/or with dust particles on them--and occasionally you will see plating defects where the plating didn't cover 100% of the playing surface. Obviously if there is a plating defect you would need to return it and get a replacement.

Cleaning your Discs

If your CD's are new then you can simply blow any residual dust off with a photographer's bulb-type air blower. But if you CD's have some fingerprints and/or dirt on them you can run them under water and use your fingers to sweep them radially. Then use a smooth, soft, clean, lint-free cloth to dry them by sweeping radially from the center to the edge.

Note: It is important to always use a radial motion rather than going around in a circular/circumferential motion when moving across the playing surface.

If you can't get them clean that way then there are commercially available CD cleaning kits that you can obtain.

What about any scratches on your Discs?

If you have scratches they might or might not interfere with the laser properly reading the data. Radial scratches or deeper scratches of course can indeed be problematic. You can tell if there is a problem if you are doing an EAC-type of ripping if there are synch errors during the transfer process.

If you are having your CD's ripped by a top-notch professional ripping service they will undoubtedly have a special resurfacing machine that buffs the CD playing surface. Alternatively if you are transferring your CD's yourself then you can ship your CD's off to a company that performs CD resurfacing.

Alternatively you can try doing it yourself as follows: Noxon metal cleaner applied with a lint free cloth, and in this case a small circular motion works best—then wipe clean from the center out. However this may or may not produce the desired results. And if in doubt we would advise don't do it!

CD/DVD Computer Drives for Ripping

Unfortunately there are no high-end CD drives for computers that we are aware of—though obviously some drives are better quality than others. We have had pretty good luck with a Plextor PX-880SA drive—although there certainly could be some unit-to-unit variability so YMMV (your mileage may vary). Once in while though you may find a CD that won't work in the Plextor PX-880SA, or whatever drive you are utilizing—so if you have an older CD-ROM (not DVD/CD combo drive) you might find that though it is slower it might work on those problem CD's. If you have more than one computer of course you can try ripping on each of them and see which one

has the drive that does the best job reading the CD's. You will also find that some drives rip more quickly than others. Sometimes a Blu-Ray drive will work well too.

Computer Hard Drives and SSD's for Music Storage

For SSD's (Solid State Drive) we are currently using the Intel MLC versions with good results. The data that we are aware of to date has shown that the Intel SSD's are the most reliable and so that is the brand that we have been utilizing. The Intel SSD SLC versions, while longer lasting, are quite a bit more expensive so for most people they aren't cost effective for storing music files at this time. However as of late 2011 the SLC versions of the Intel SSD are being discontinued and have been replaced by HET MLC drives. However these are still more expensive than the Intel consumer level MLC SSD drives.

With every passing year hard drives are continually getting larger. Already in 2011 there are 4TB drives—with 5TB and larger drives on the horizon in 2013 and beyond. However you should know that drives larger than 2TB should only be used in the newest, most up-to-date hardware/firmware/software configurations i.e. UEFI-based motherboards, etc.

Currently we are recommending enterprise grade drives such as either the Western Digital 1TB RE3 WD1002FBYS hard disks or the Western Digital 2TB RE4 Western Digital RE4 WD2003FYYS hard disks for storing music files with good results. [Note: RE stands for RAID edition and that is one of the reasons why we are utilizing these two particular models. They also support [TLER](#) (Time-Limited Error Recovery) and [RVS](#) (Rotational Vibration Safeguard) which may be worthwhile for RAID arrays in a NAS.]

We have also had good success with the consumer grade 3-platter Samsung F4 2TB hard drive. However because this is a 4K sector drive you should know that there is a firmware update for it if it was manufactured in 2010—and there is no way (that we are aware of) to tell what version of firmware is installed without going through a somewhat convoluted process of re-flashing the firmware.

As of 2013 we have had good luck with the 4TB Hitachi drives. Both consumer and enterprise versions are available—with the enterprise versions being more expensive of course. But if you don't wish to fool around with replacing hard drives that are either about to fail or have failed the enterprise drives are recommended.

As of mid-2016 now 6TB and 8TB drives are available—and even 10TB too! Obviously this trend of larger and larger drives becoming available is expected to continue over the years to come.

RAID

RAID is an acronym for "redundant array of inexpensive disks". We recommend using some sort of redundancy on your music server such as RAID 1, 5 or 6. Note that RAID 0 is not redundant so is not recommended. Alternatively if you are using a Netgear NAS (network attached storage) unit then we recommend using either RAID

1 or xRAID. If you are using a Synology NAS, which is what we are using currently here in the store, you have the choices including of RAID 1, SHR-1, or SHR-2 (Synology Hybrid RAID). Here in the store we have opted to use RAID 1 which means all data is "mirrored" on a dedicated matching drive.

This brings up a potentially important consideration and that is if a drive drops out of a RAID 1 array (meaning it stops working!) it will be easiest to get at your data immediately without waiting potentially many hours, or even a day or longer, for the RAID array to rebuild. In fact you can pull a RAID 1 drive out and use it in a non-Linux operating systems such as a Windows computer by adding in the ability to read EXT3 or EXT4 formatted drives. (This can be achieved with a small download.) Because most NAS boxes today are using Linux as an OS (operating system), EXT3 and EXT4 are the most commonly used file systems in most commercially available NAS systems—although a few NAS do use Windows NTFS.

File Formats

In our listening tests so far we have found that both **WAV** and **AIFF** files seem to sound slightly better than **Uncompressed FLAC**. However these results may be a function of the hardware/software combinations that we have been listening with. In the future we will continue to do some more listening comparisons in this regard.

WAV is in some respects a logical choice if you are only considering sound quality. And, between file naming and tagging, WAV can be made to work in terms of metadata. In addition our experience has been that WAV is the most consistent when it comes to getting good rips that actually work, i.e. the music plays! After all the type of file that is on a CD is WAV so there is no conversion process. [Note: Technically speaking the CD-DA audio data on a CD is LPCM (linear pulse code modulation) and by definition conforms to the Red Book standard. The difference between CD-DA audio data and files in either WAV or AIFF format is simply that with WAV or AIFF it prefaces the LPCM data with a short header.] To utilize FLAC the file must be converted by the playback software.

NOTE: WAV or AIFF or FLAC files can be created in dbPowerAmp or other ripping software during the ripping process.

Tip: You can check on whether the rip of a CD works or not by viewing the album tracks in Tag&Rename. If you see that there is a "stream reading error" you will know that you have to re-rip those tracks. Each track that doesn't rip correctly will pop up that "stream read error" when viewed, the track(s) will be highlighted in pink, there will be no metadata, and there will be no track time as it will report "00:00" for track time. For whatever reason, we have seen tracks that would not rip in AIFF then work when ripped to WAV.

However WAV may not necessarily be as good as AIFF in terms of metadata—though this may be dependent up on the ripping software utilized when transferring music from CD's along with the particular music server software being used to play the files. With JRiver Media Center we have seen no difference in metadata between WAV and AIFF.

So either WAV or AIFF can be made to work quite well depending on the type of music you listen to and the software/hardware that comprises your music server. That being said FLAC may be preferred for its robust metadata support—plus downloaded high resolution files are usually in this format. Of course downloaded FLAC files can always be converted to either WAV or AIFF if you prefer.

Testing the various file types on your music server of choice in terms of sound quality, rips that function, and metadata is of course always recommended. And for your testing purposes dBpoweramp can rip a CD to all of the following formats: WAV, AIFF, Uncompressed FLAC, and Compressed Lossless FLAC. That way you can listen for yourself.

Of course it is always possible to rip to more than one format utilizing different storage drives simultaneously. For instance you could rip WAV to disc 1, AIFF to disc 2, and FLAC to disc 3 simultaneously.

Note: If you are going to use FLAC, we would recommend Uncompressed FLAC rather than Compressed Lossless FLAC. With some ripping software, for instance dBpoweramp, one can choose different levels of compression (from 0 to -8) for Compressed Lossless FLAC files.

Note: AIF is the same as AIFF. However AIF-C is different in that it is a lossless compressed format (as can be FLAC). WAV is the file extension used for a Wave file.

Storage Space Requirements for Various File Formats

Because storage is quite inexpensive there really is no reason to use lossy or lossless files anymore for home use. For high end audio playback we recommend the **WAV**, **AIFF**, or **Uncompressed FLAC** formats which are highlighted in bright yellow below:

The table below shows approximately how much storage space is need for 1000 CD's in various formats:

Format	Bit Rate kbit/s	Storage Estimate (GB)
AAC	96 - lossy compressed	55GB
AAC	128 - lossy compressed	73GB
AAC	160 - lossy compressed	92GB
AAC	192 - lossy compressed	110GB
AIFF	1411 - Uncompressed	780GB
AIF-C	Compressed	Varies
FLAC	Variable Bit Rate, typically 650-1100 - Lossless Compressed	450GB
FLAC	1411 - Uncompressed	780GB
MP3	128 - lossy compressed	73GB
MP3	192 - lossy compressed	110GB

MP3	224 - lossy compressed	128GB
MP3	320 - lossy compressed	183GB
WAV	1411 - Uncompressed	780GB
WMA	64 - lossy compressed	37GB
WMA	96 - lossy compressed	55GB
WMA	128 - lossy compressed	73GB
WMA	160 - lossy compressed	92GB
WMA	192 - lossy compressed	110GB
WMA	Lossless Compressed	470GB

The above are based upon the PCM multi-bit "Red Book" CD format which is a 44.1 kHz sampling rate/16 bit file format. CD file sizes will vary with playing time and are typically between 400-800MB for a single album. Technically speaking the Red Book standard says the maximum playing time of a CD is 74 minutes 30 seconds. However there are some CD's that are up to 81 minutes or so in length. (The way a longer playing time like that can be achieved is the CD pressing plant can push the track speed and track pitch tolerances, which are set in the Red Book standard, to their limit.)

Whereas high resolution PCM files, such as a 192 kHz/24 bit file, can be in the range of 4-5GB per music file for a stereo album of up to 80 minutes or so playing time. Similarly a "single-bit" DSD file can also be up to 4-5GB in file size.

Sampling Rate/Bit Rate = Bits per Second

MP3 file = 128 kbps to 320 kbps (lossy compressed)
 44.1 kHz / 16 bit = 1409 kbps
 48 kHz / 16 bit = 1536 kbps
 88.2 kHz / 24 bit = 4234 kbps
 96 kHz / 24 bit = 4608 kbps
 176.4 kHz / 24 bit = 8467 kbps
 192 kHz / 24 bit = 9216 kbps
 384 kHz / 24 bit = 18432 kbps

Metadata

For music files the 4 basic fields for metadata are:

- Artist
- Album
- Track #
- Track Title - (song name for popular music—or movement for classical)

That plus the following are standard in most music server software:

- Genre - (rock, jazz, classical, etc.)

- Track Time - (i.e. hours:minutes:seconds)
- Date of Release
- Album Art - (i.e. a jpeg of the album cover)

Plus for classical music, depending on the piece, categories such as the following may be needed.

- Conductor
- Composer - [Note for a listing of classical composers with a recommended formatting [Click Here](#)]
- Chorus
- Major Soloist(s) - for instance for a piano concerto the name of the pianist—or for an opera the major singers

For example in order to differentiate one version of Beethoven's Ninth from another you certainly at least need to know the conductor.

Note: For Classical music, using [dBpoweramp](#) or [Sonata](#) (which is a proprietary version of dBpoweramp) software, both of which use the GD3 and Sonata databases, to rip your CD collection gives more fields of metadata than using Exact Audio Copy. Another possibility is [Musichi](#) which is especially good in terms of metadata for Classical music as well as Jazz.

In addition the following fields are also sometimes necessary in order to differentiate different versions of the same piece:

- Recording Date
- Remastering Date

Besides the above there are also other fields available in some music server software. You can download [JRiver Media Center](#) and/or [Sonata](#) and/or [MediaMonkey](#) for free and look at all of the options, including the custom options if you wish. We have been using JRiver Media Center on our music servers at the store for years now and we recommend it highly.

While we recommend using dbpoweramp because of the superior metadata support, especially for classical music, alternatively you could use [Exact Audio Copy](#). And if you are using Exact Audio Copy here are some [tips](#).

With all this being said, one important thing to keep in mind is that if you care about the playback sound quality of the files you are listening to then a quality music server with a high quality digital output is essential. Even with the same DAC, you will hear that some music servers will sound better than others playing the same exact music file.

File Name Length

Technically speaking a file name should be limited to 64 characters—however in practice it seems that at least in some cases longer file names can be accommodated up to 103 characters long. However the allowed file name length limit is also be

affected by how many folders and subfolders the file is nested in and the length of the name (i.e. number of characters) of each folder and subfolder.

With classical music especially you should be careful to not make the file names too long. If you do you may not easily be able to rename the file to a shorter file name. Plus you may even have trouble deleting it. There is a workaround as delineated in the next paragraph—but it is easier to do it right the first time!

If you do have trouble deleting a file in Windows because the name is too long, you can move the file folder containing them to the trash. But first recopy the good files back to another file folder, and then you can re-rip just the files that had names which were too long.

Note that if the file name is too long when you copy it to another hard drive you will not be able to do so without a tilde (~) shortening the file name which can mean that your music server software will not give you any metadata unless you have tagged the file. Then you will have to redo the original file transfer after shortening the file name or go through a process of renaming copies of the files one by one.

To rename the files with a tilde, copy all of the files in the folder to another folder including any "good" files with names that weren't too long along with the ones that have corrupted names and which consequently have a shortened name which include a tilde in the file name. After the files are copied you can then rename the files by typing in the correct file name. Time-consuming yes, but it does work.

Note: In case you don't know a tilde is this symbol: ~

Works Numbering

In the case of longer works which go higher than the number 9, you will find that they may naturally cascade in the correct order if you use a space before the single digit ones. Here is an example:

- Mahler Symphony No. 1
- Mahler Symphony No. 2
- Mahler Symphony No.10 Adagio

Another way of doing this is to insert a zero before any single digit numbering sequence as follows:

- Mahler Symphony No.01
 - Mahler Symphony No.02
 - Mahler Symphony No.10 Adagio
-

Track Numbers

If you have 10 or more Tracks, you should pad the single digit numbers with a zero. The reason to do so is that this way Track 10 will be at the end after Track 9. In other words:

- 01
- 02
- 04
- 04
- 05
- 06
- 07
- 08
- 09
- 10

There are two ways to edit track numbers. Either in the name of each file (each album folder will have the tracks inside each of which can be and usually is numbered) and/or in the Tag itself. We recommend doing the latter.

Another option for doing track numbers is 1/10, 2/10, 3/10—in other words (1 of 10), (2 of 10), (3 of 10), etc. Or when setting up the metadata tagging in dbpoweramp you can specify the following: 01/10, 02/10, 03/10, etc.

Reassigning Track Numbers to Larger Works

There may be instances where you wish to reassign track numbers. For instance if a work starts in the middle of CD #1 and continues on to CD#2, then you may wish to go into the file names and manually reassign track numbers so that the files are all in a numerically ascending order. At the same time you may wish to combine all of the files into a single folder. Yes this can be time-consuming but it can make for better overall organization for searching as well as for easy playback.

As an example: In the Hyperion release of **Tatiana Nikolayeva** playing **Bach: Die Kunst der Fuge (The Art Of Fuge)**—(or if you prefer, **The Art of the Fuge**)—that particular work starts on track #7 of the first CD and goes all the way to the end of the second CD. So rather than start the piece on track #7, if you wish you can put the entire piece in one folder and renumber each track starting with track #1.

In addition if you are using Tags then you will need to edit the track numbers there too.

Also if you are combining tracks from two different CD's you may also wish to edit the Disc #.

Both Track # and Disc # editing can be done in **Tag and Rename**. This kind of editing can also be done in JRiver Media Center--however you definitely need to know what you are doing in JRiver to set up and use the program properly in order to do metadata editing correctly.

File Folder(s) for your Music Files

Before you start transferring your music it is important to think about how you will organize your recordings on your music server/computer. Of course you could put

everything into one folder entitled "Music". This approach may work best with some music servers. Alternatively you could have a "Music" folder and inside that you could have other named folders. For information on this latter approach here is a [link](#).

For any sizable collection it is usually preferable to have a separate drive just for your music rather than have your "Music" folder on your boot drive.

However if you have for instance...

- a large classical collection
- a large jazz collection
- and a large collection of genres other than those two

...then you may wish to have three separate drives, one for each. Specifically with respect to classical and jazz, for certain global metadata tweaking purposes it may be more efficient to have them each on separate drives.

The Naming of an Artist or Group

Before you start, it is advisable to think about how you wish to have artists, groups, or composers named—especially their exact spelling and format.

For instance "**The Beatles**" could be under "T" or you may wish to have them under "B" for "**Beatles**". Note that in some music server software there may be the option to ignore the word "The" in the name of a band so that The Beatles would be listed alphabetically under "B" rather than "T".

Then there is **Stevie Ray Vaughan**. Do you want to have this name alphabetized under the first or last name? "S" for **Stevie** or "V" for **Vaughn**? Personally I would suggest the former for all popular (meaning non-classical) artists, but the choice is of course yours. And certainly the latter can make perfect sense too. The important thing is to be consistent with whatever approach you choose.

The Naming of a Classical Composer, Conductor, or Musician

For classical composers and artists for instance there can be any number of different possible ways to spell **Tchaikovsky** including:

- **Tchaikovsky**
- **Tchaikowsky**
- **Tschaikowsky**
- **Tsjaikovski**
- **Tchaikowski**

And there are undoubtedly more. Especially with Russian names it seems that there can sometimes be multiple ways to spell them in English. Another example is **Tatiana Nikolayeva** whose name can also be spelled as: **Tatyana Nikolaeva**,

Tatyana Nikolayeva, Tatiana Nikoleyeva, Tatiana Nikolajeva, Tatjana Nikolajeva. Of course in Russian it is: **Татьяна Николаева**etc.

Also you should consider whether or not to use an *umlaut* as in **Karl Böhm**-- or an *accent egu* for **Gabriel Fauré**. If you an English speaker then you may find that it is easier if these accent marks are omitted. Either way though the ideal is always to use the same convention throughout your entire collection. Note that technically if you omit the *umlaut* as in **Böhm** then you would spell his last name as **Boehm**. However English speakers may choose to simply spell is as **Bohm** and leave it at that.

Then there are options to consider like the following: For **Herbert von Karajan**—you could use either: **Karajan, Herbert von** or **von Karajan, Herbert**. Personally I prefer **Karajan, Herbert von**. However for **Ralph Vaughan Williams** I would definitely suggest **Vaughan Williams, Ralph**!

With regard to vocalists who are principle soloists there are two conventions that are oftentimes used. Either list the most famous vocalists first. Or go from highest voice (soprano) down to lowest voice (bass). In the latter case it would be **soprano, mezzo** (mezzo-soprano), **alto** (contralto), **countertenor, tenor, baritone, bass**. The first three being female and the last four being male. Of course if you wish you may further subdivide sopranos into various types as follows: **coloratura** soprano, **soubrette, lyric** soprano, **spinto** soprano, and **dramatic** soprano. There are other types of soloist such as a **boy soprano**, etc.

When there is a choir or choirs, typically choirs are listed after soloists if both are present. Then there is the choice of original language or English translation for the name of a choir i.e. **Rundfunkchor** or **Berlin Radio Choir**.

The same is true with orchestras. There is the choice of original language or English translation for the name of a orchestra i.e. **Wiener Philharmoniker** or **Vienna Philharmonic Orchestra** (aka VPO).

The ideal is to make sure that each musician, group, conductor or composer is always spelled the same way—which may mean that you have to retype some of the metadata in order to make your collection properly searchable. And this is especially true with classical music collections of any size! The reason is that in the online metadata databases various albums of the same artist can have the same person's name spelled differently. Of course it is always a good idea to test your conventions using the music server software that you will be utilizing!

Classical Composers - Metadata Formatting

For classical composers below is a nice naming convention which can be utilized. And if you like this approach then here is a [link](#) to a much more complete listing of composers using this formatting:

Bach, Johann Sebastian (1685-1750)

Beethoven, Ludwig van (1770-1827)

Brahms, Johannes (1833-1897)

Handel, George Frederick (1685-1759)

Haydn, Joseph (1732-1809)

Mahler, Gustav (1860-1911)
Mozart, Wolfgang Amadeus (1756-1791)
Schubert, Franz (1797-1828)

Multiple Artists & Album Artists: Choosing Punctuation

If there are several musicians playing together on a track (and of course on an album it may be that all of the tracks are the same combination of artists—or maybe not in which case each track needs to be named separately—there are different ways to separate the names. For instance you may use a semicolon, a slash, or a comma. Different software will use these differently though.

Note: Some software will automatically convert a semicolon to slash which is fine.

In JRiver Media Center if you have two artists separated by a semicolon then they will be listed as two separate artists. Here are some examples:

Karajan; Berlin Philharmonic Orchestra

or

Karajan; Berlin

or

Karajan; BPO

Whereas in some music server software such as JRiver two artists separated by a comma will be viewed as a single entity. Here is an example:

Karajan, Berlin

Some years ago when we used to use Media Monkey we found that you were better off using the latter approach (using a coma to separate artists on any given track) if you were using Media Monkey on your music server and as a remote control using the MonkeyTunes app which communicates via Wi-Fi to an Apple iPod Touch, iPhone, or iPad running the Apple Remote app. The reason is that if you tried to use a semicolon you weren't able to click through from an artist to anything—as you'd only get a blank screen with no albums or tracks listed even though they are indeed in the database. This may have been fixed in later versions of Media Monkey of course.

But with JRiver music server software, as well as some other software, a semicolon is a better choice than a comma. A slash may also work fine. But our experience is when initially entering metadata that it may be preferable to use the semi-colon.

The main advice here is to select a particular approach and then test it using the music server software/hardware combo before spending a lot of time doing your whole collection! As trying to correct it all after the fact for a whole collection is a real chore!

Note: In some music server software there can be a differentiation between an Artist and an Album Artist and both fields may be present.

Spelling, Capitalization, and Punctuation can Matter!

Especially with classical music there can be more than one way to spell the name of a particular work. For example Bach's St. Matthew Passion could be named in a variety of ways:

- Bach: St. Matthew Passion
- Bach: St. Matthew Passion, BWV 244
- Bach St Matthew Passion
- Bach, St. Matthew Passion
- Bach St. Matthew Passion
- St. Matthew Passion
- St Matthew Passion
- Saint Matthew Passion
- Johann Sebastian Bach St. Matthew Passion
- JS Bach St. Matthew Passion
- J.S. Bach St. Matthew Passion
- J. S. Bach St. Matthew Passion
- Bach- St. Matthäus-Passion
- Mattheus-Passion
- Matthäuspassion
- Passion selon Saint Matthieu

Well you get the idea—there are numerous variations on the theme!

Personally my preference is for the first version, i.e. **Bach: St. Matthew Passion** as it is short and straightforward. Alternatively **Bach: St. Matthew Passion, BWV 244** works well too—but whatever your preference is is fine. Though whatever you decide upon, it is suggested that you stick with the same convention. For instance putting the name of the composer in front of the piece or not, etc. One thing that experience shows is that if you have more than one version of a particular piece, it is especially advisable to spell it the exact same way so that you can find all versions of that piece easily when you do a search.

My preference for using "**Bach: St. Matthew Passion**" also assumes that "Bach" means "Johann Sebastian Bach". "CPE Bach" or "Bach, CPE" are examples of ways to indicate a particular son of Bach. And I prefer the second approach for alphabetical searching reasons.

Going further there are two more modifications which I prefer to use when circumstances dictate. First if you have the same piece done by several different conductors then you might wish to do the following:

- Bach: St. Matthew Passion [Herreweghe]
- Bach: St. Matthew Passion [Karajan]
- Bach: St. Matthew Passion [Richter]

- Bach: St. Matthew Passion [Rilling]

As the same conductor may record a work more than once, in such a case here is how I like to format the name of a classical album:

- Bach: St. Matthew Passion [Herreweghe] 1984
- Bach: St. Matthew Passion [Herreweghe] 1998
- Bach: St. Matthew Passion [Karajan] 1950
- Bach: St. Matthew Passion [Karajan] 1972
- Bach: St. Matthew Passion [Richter] 1958
- Bach: St. Matthew Passion [Richter] 1979
- Bach: St. Matthew Passion [Rilling] 1978
- Bach: St. Matthew Passion [Rilling] 1994

Note in the above example the date is the recording date (or the original release date) as opposed to the re-release date of that particular recording. [Note: you might also choose to use square brackets to encompass the conductor, year]

Once again it is advisable to test your naming strategy in order to ensure that you won't have problems that you'll have to go back and correct! It can very time consuming to re-edit names of artists, albums, and tracks in a large collection!

Also you should carefully look at your music server software setup (usually) under "Options", and set it up for the way you wish for things to be shown on screen.

CD Numbering

Some longer pieces may be on more than one CD. In which case you could notate that as follows:

- Bach: St. Matthew Passion [Herreweghe] 1984 CD1
- Bach: St. Matthew Passion [Herreweghe] 1994 CD2
- Bach: St. Matthew Passion [Herreweghe] 1994 CD3

Or if you prefer you could notate it as:

- Bach: St. Matthew Passion [Herreweghe] 1984 Disc 1
- Bach: St. Matthew Passion [Herreweghe] 1994 Disc 2
- Bach: St. Matthew Passion [Herreweghe] 1994 Disc 3

With regard to CD numbering in larger box sets there is a convention commonly utilized. For instance in the Arthur Rubinstein Complete Album Collection which has 142 CD's the notation in the metadata can be as follows:

- 1/142
- 2/142
- 3/142

Live Recordings

Many recordings are studio recordings or recording sessions. But some recordings are made during live concerts with an audience which can add a certain spark, spontaneity, inspiration. When a recording is made live it is nice to note that as follows:

Bill Evans: The Complete Village Vanguard Recordings, 1961 Live

Allman Brothers Band: At Fillmore East Live

Mahler: Symphony No. 7 [Abbado; Berlin] 2001 Live

Or sometimes an album may be commonly known as:

Allman Brothers Band: Live at Fillmore East

Though of course sometimes "Live" may be part of the name of the album:

Horowitz: Live And Unedited, The Legendary 1965 Carnegie Hall Return Concert

Les McCann: Live At Montreux, 1972

Folder Hierarchy

If you are using a main folder termed "Music" then you will typically have subfolders as follows:

Below the "Artist" folder level in the hierarchical tree structure there would then be an individual folder for each "Album"—the name of which would be the name, abbreviated or not, of the album. In each album folder would be the files of the actual tracks or movements as well as the track numbers. Most people prefer to have the track numbers before the track name rather than after—but ultimately that is a personal preference.

So then a hierarchical folder tree could look like this: **Music>Genre>Artist>Album**

Below are some real world examples which will illustrate various aspects of categorization for you to consider:

The Beatles: Abbey Road (2009 remastered CD)

For example:

Music>Beatles>Abbey_Road>songs

For Abbey Road there are 17 songs so there would be 17 files in the "Abbey_Road" folder.

Since the Beatles albums were remastered in 2009, if you have that new better sounding remastered version then you could include that information too. So then the folder tree would look like this:

Music>Beatles>Abbey_Road_2009>songs

(Note that the track numbers can be either before or after the name of the song in the file name for each track. The method we have normally used is track # before track name—but as long as you always do it the same way you can do it either way.)

Note that in this example the remastering year and the rerelease year are the same, although there are many cases when they can be different.

Bach: The Art of Fugue (Die Kunst der Fuge) - played by pianist Tatiana Nikolayeva

Alternatively a hierarchical folder tree could look like this:

Music>Artist>Work

For example:

Music>Nikolayeva>Art_of_Fugue

[Note: There are 20 movements in The Art of the Fugue so there would be 20 files in the last folder entitled in the example above as "**Art_of_Fugue**".]

There is another aspect to consider too. Let's say that you have The Art of Fugue that spans two CD's as in the case of this release—as The Art of Fugue actually starts in the middle of the first CD at Track #7 and runs through to the end of the 2nd CD. Then you may wish to put all of the tracks of that piece into one folder. If you do this then you would need to redo the track #'s for both the first and the 2nd CD so that they are arranged in the proper playing order. In addition the Disc # can be edited and in this example you would change the Disc # to 2 for the tracks from Disc #1. Also you might wish to create one more folder for the first 6 tracks of the CD in this particular example. This is all personal preference of course.

Beethoven's Ninth Symphony - conducted by Herbert von Karajan

Sometimes a conductor does the same piece more than once. For instance von Karajan recorded at least 7 different performances of Beethoven's Ninth Symphony. He recorded 4 performances in mono ([1947 Vienna Philharmonic](#) & [1955 Vienna Symphony](#) & [1955 London Philharmonia](#) & [1957 Berlin Philharmonic](#)) and 3 in stereo ([1963](#), [1977](#), [1984](#) with the Berlin Philharmonic).

So then the hierarchical folder tree could look like this:

Music>Artist>Work_date

For example:

Music>Karajan>Beethoven>Symphony_No9_rec1963

or

Music>Karajan, Herbert von>Beethoven>Symphony_No9_rec1963

[Note: Here there are 4 movements so there would be 4 files or tracks in the last folder.]

Then to make things even more complicated there are remastered versions of these performances available. So you could add in the remastering date of either 1997 or 2003—which in the following example is 2003—in which case the tree could look like this:

Music>Karajan>Beethoven>Symphony_No9_rec1963_rm2003

You could also name the artist **Karajan, BPO** which is the abbreviation for Herbert von Karajan conducting the Berlin Philharmonic Orchestra. (Alternatively you could abbreviate it as **Karajan; Berlin.**)

So then the tree would look like this:

Music>Karajan, BPO>Beethoven>Symphony_No9_rec1963_rm2003

In the examples above **rec** is for **recording year** and **rm** is an abbreviation for **remastering**. You could also put the abbreviation after the year as **2003rm**. You could also choose to not put the abbreviations in such that then it would look like this:

Music>Karajan, BPO>Beethoven>Symphony_No9_1963_2003

Optionally, though it isn't necessary, you could also add in the release date if you wish so that would mean even a 3rd year designation. The reason for this is that, with at least one particular version (originally recorded in 1963) of von Karajan's Beethoven Ninth, first there was the original mastering for CD, then a 1997 remastering, and then a 2nd remastering done in 2003. However there have been more than 3 release dates as there have been a number of different CD pressings in different CD packaging.

Obviously which interpretation it is is most important. Once you have determined the recording date which is usually enough to identify which recorded interpretation it is, the remastering date is the next most important one as that will affect the sound quality. Generally speaking the release date will have no effect whatsoever on sound quality. However it isn't always easy to find out what the remastering date actually is as opposed to the release date as that is sometimes easier to learn. It depends upon how much you wish to know about which version it is that you are listening to and how much time you are willing to invest in doing the requisite research. Fortunately many times if you read the fine print in the CD booklet the recording and remastering dates are usually listed either near the front or near the back.

In this particular example just above, at last count there were 21 different CD releases currently available that contain a von Karajan Beethoven Ninth. You can see a listing of them all [here](#).

And von Karajan isn't the only example of a conductor who did numerous versions of Beethoven's Ninth. For instance Klemperer did at least 7 recordings of the Ninth:

November 1957 - Philharmonia Orchestra (studio)
May 1956 - Concertgebouw (live)
November 1957 - Philharmonia Orchestra (live)
January, 1958 - Kölner Rundfunk Sinfonie Orchestra (live)
June 1960 - Vienna Philharmonic Orchestra (live)
November 1961 - Philharmonia Orchestra (live)
October 1964 - New Philharmonia Orchestra (live)

Faure's Requiem - conducted by Philippe Herreweghe

Alternatively a conductor might record 2 different versions of the same piece. For instance there is an 1893 chamber version of Faure's Requiem and a 1901 concert version. The latter version was rewritten for a larger ensemble and included more instruments.

So then the hierarchical folder tree could look like this:

Music>Conductor>Work_date

So for example:

Music/Herreweghe/Faure_Requiem_1893/

And then the listing for the other work would look like this:

Music/Herreweghe/Faure_Requiem_1901/

[Note there are 7 movements so there would be 7 files or tracks in the last folder.]

Compilations

If you have a compilation CD with a number of different artists then you may wish to include the artist name as a part of each track name (possibly at the end in parentheses).

Some music server software has an option which will handle compilations of various artists on different tracks. If using JRiver Media Center then as long as the files have been ripped well (for instance properly done in dBpoweramp) it also does a fine job of handling compilation discs. Or in MediaMonkey software for example the "Artist" name can be different for each track—while at the same time the Album Artist can be listed as the same such as "Various". This means that all of the tracks will show

up in one album but you still will be able to see the name of each individual artist for each individual track.

In classical music there are often pairings of two or more pieces by different composers. And you may wish to leave the albums sequenced as they are. For an example when Horowitz gave a concert he had a definite idea of what order to play certain pieces in and you may wish to listen as you would in a live concert

Album Art

A nice touch is to add in the front cover Album Art as you rip a CD. You can include the album art file in the same folder as the music files so that it is easily accessible. There are several sites which you can copy and paste from in order to get album art if you don't already have it. Unfortunately many of the labels do not have good quality cover art on their websites—though hopefully this will change in the future when they understand that people with music servers appreciate nice looking, good quality cover art. If you wish you could email your favorite labels and ask them to put up larger and higher quality cover art on their website. If enough people request it hopefully they will do so sooner rather than later. After all they don't even have to scan it—as they have the original artwork! Two examples of labels that do have higher quality artwork on their websites include [Hyperion](#) and [Chandos](#). Listed below are some other websites where you may be able to find the cover art:

<http://www.albumartexchange.com/> - excellent quality large images, mostly for popular music (Tip: for search use exact spelling) - 600x600, 800x800 and larger

<http://www.emusic.com/listen/#/> - good to excellent quality - 600x600 - (site can be a bit slow & the search function isn't always the best. A better approach to searching this site is with google where you put in the name of the artist and album along with emusic.com.)

[Qobuz](#) - fairly extensive - has some obscure classical cover art

[CoverLib](#) - 600,00+ titles - some large high quality classical cover art

<http://www.7digital.com/> - 500x500 good quality images (fairly large database)

<http://www.cduniverse.com/default.asp> - many better quality images (large database)

<http://www.classicsonline.com/> - a good selection and many times very good artwork

<http://www.amazon.com/> - an enormous collection of images and when expanded many are good (excellent and fast search function)

[La Chaumière à Musique](#) - has some obscure classical cover art

<http://images.google.com/> image quality varies greatly (but hit-or-miss search function)

<http://allmusic.com/> - usually good image quality (huge database)

<http://music.barnesandnoble.com/index.asp> - unfortunately image quality and size is no longer very useful since the site was redesigned

<http://www.album-cover-art.org/> - connects to Amazon

<http://albumart.org/> - connects to Amazon

<http://www.seekacover.com/> - inconsistent sizes

<http://www.allcdcovers.com/> - large sizes

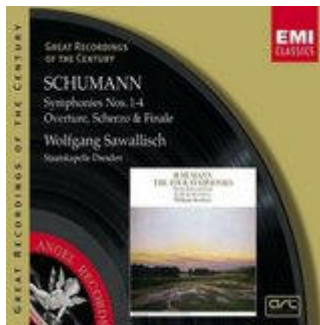
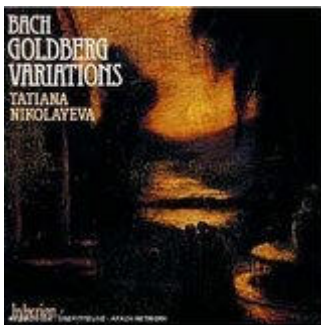
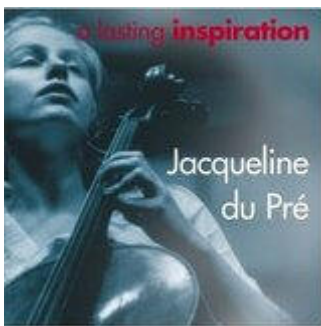
<http://www.coverhunt.com/> - fairly large selection, OK image quality but not great (but better than arkivmusic)

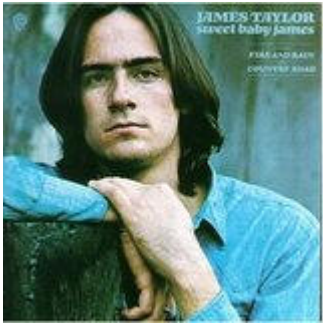
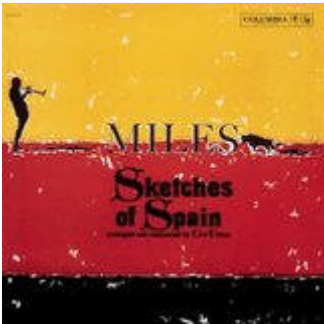
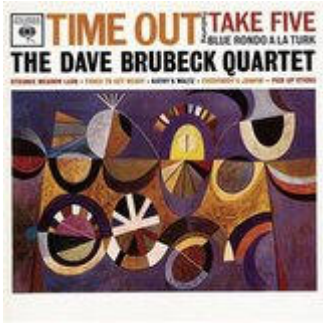
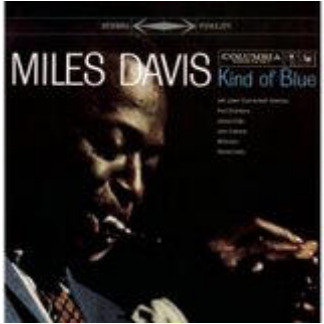
<http://www.walmart.com/cp/Music/4104> - cover art tends to be pretty good (selection not the greatest though)

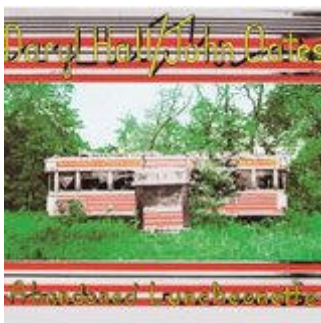
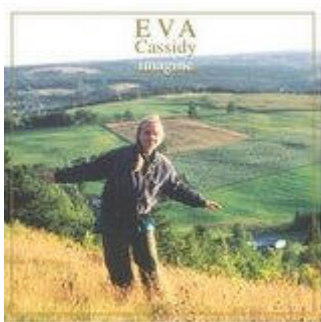
<http://www.arkivmusic.com/classical/main.jsp> - quality of images small and low quality (but has a superb search function for classical music!)

<http://www.hbdirect.com/> quality of images not great - relatively large database

The first five sometimes have higher quality album cover images that can be seen if you click on the image to expand it—although sometimes if you click on the image in Amazon you can get good quality scans too. However the expanded Amazon scans are sometimes surrounded by a very large white border—which if you wish to perform that extra step can be cropped out in [Picasa](#) or any other photo editor.







At the same time as you add the album cover artwork you also have the opportunity to add additional artist and/or album metadata info in text form in the "Notes" field which you can type manually or copy-and-paste. For instance you might wish to add in the name of the label—or even keep a list of additional albums by a particular artist that you would like to eventually acquire.

Depending upon your music server software you also may need to use one of the following as the name for each jpg as follows:

- **folder.jpg**
- **cover.jpg**

At this point it seems that **folder.jpg** is the most universally acceptable name for an album cover file.

In addition some music server software doesn't work with album cover file sizes that are too big. For instance 600kb is a limit that is sometimes in effect; there may be others. Once again it is good to check with the music server software that you intend to use to make sure you precious album covers will show up!

Also depending upon your music server software you might want to aim for a certain size. For instance high quality cover art is sometimes found in sizes such as 600x600 or 800x800 or 1000x1000 or 1500x1500 pixels. Some music server software will take a larger size jpg and display it as a smaller sized thumbnail. But usually it is still viewable as a larger sized photo if desired with a click or a tap.

Another thing to watch out for is an image which is not perfectly square. For instance a 1000x1000 pixel image is square. But an 800x1000 is not square and sometimes will be displayed in a truncated fashion. Once again we recommend testing parameters such as this in your music server—as well as any control app that you might be using—to see if this is important or not in order to optimize your system.

Note: With most music server software each jpg should be placed in the album folder containing the tracks. Specifically if you are using JRiver music server software, here is a [link](#) for more info.

Tip: If your cover art size is 1000x1000, and if you are using a 1st or 2nd generation iPad to control your music server with an app—and your iPad has a screen resolution lower than 1000x1000—then you could try using either the iPeng or SqueezePad apps. Fortunately however with the 3rd gen or later iPad the resolution has now been increased to 2048 x 1536 pixels.

However sometimes you will have to scan your album cover—as either you can't find it on the web at all or what you can find are only blurry, low quality images. For that purpose you can use a flatbed scanner. In that case the scanner software used must have a "descreen" option when printed images are scanned in at a high resolution. Otherwise without descreening a distracting moiré pattern may be evident.

Tip: If the cover is part of a multi-CD box set and is basically a cardboard sleeve, it is recommended to first remove the CD before scanning so it will sit flat. That way you may get a noticeably better quality scan at the edges without as much in the way of light source reflections.

In addition to front cover art you may also choose to add in back cover art. You might need to scan this yourself as it is harder to find back cover images on the web.

In order to do a good job of scanning your own front or back covers it requires some know how. Here are some technical guidelines:

Suggested maximum width and height: 1500 pixels

Suggested filesize: 2MB or smaller

Aspect ratios:

The typical CD cover aspect ratio is square. And these are the suggested sizes to use in pixels:

- 600 x 600
- 800 x 800
- 1000 x 1000
- 1500 x 1500

For 1:0.9 aspect ratio digipaks here are the suggested sizes to use in pixels:

- 600 x 540
- 800 x 720
- 1000 x 900
- 1500 x 1350

For 1:0.88 aspect ratio digipaks here are the suggested sizes to use in pixels:

- 600 x 528
- 800 x 704

- 1000 x 880
- 1500 x 1320

Alternatively if you wish you can crop 1:0.9 and 1:0.88 aspect ratios to square them up.

If you care about how nice your cover art looks there are some forum threads [here](#) and [here](#) on the subject of doing quality scans.

It can also be possible to include a pdf of the liner notes in your album folder.

Types of computer drives for ripping

Our experience has been that if you have a large collection of CD's it is good to have 2 or 3 different drives to choose from. For instance you might have 2 computers, each with a DVD/CD drive of different makes and/or models. Or for example you might have one ripping computer with two drives—a DVD/CD drive and a Blu-ray drive. For whatever reason sometimes a Blu-ray drive may rip problematic tracks more accurately than a regular CD/DVD drive—or vice versa. Or a different make of DVD drive may work better on a particular CD. The larger your music library is the more you might find this to be worthwhile—especially if you have 100's or 1000's of CD's.

Tip: It is usually advisable to do your ripping as well as other types of music file work—such as file conversion, metadata research/editing, and cover art searching/editing/correcting—on a separate computer. That way your music server only does one function and that is acting as a music server. After all you want your music server to act in as robust and reliable a way as possible!

Ripping in Windows

If you would like to use a free Windows program then we can recommend that you use Exact Audio Copy (EAC) with AccurateRip to rip your CD's to WAV files. Obviously with the large hard disks or SSD's (Solid State Drives) available today it is both unnecessary and sonically deleterious to use any lossy compression. Alternatively if you wish to use [FLAC](#) (or some other type of lossless compressed files) that is your choice. One advantage to using FLAC is for embedded metadata—however if you use [Tag and Rename](#) you can tag WAV and AIF, as well as other file types, too.

While there are a significant number of options to consider when initially setting up the program, for optimal results using Exact Audio Copy make sure at the very minimum that you set it up with the following two options selected:

- Secure mode
- "High" Error Recovery Quality

Though in the past we have used EAC with excellent sonic results, you should know that there is a wizard mode for setup (as well as guides online) for configuring the numerous options, all of which need to be properly set to ensure "bit-perfect" rips.

This is not a procedure that a casual user will find intuitive—and even assuming proper configuration there is still the issue of track tagging and overall metadata congruity. (Note: See "File Naming" above)

In EAC if you get a track that rips to less than 100% in terms of quality, you can always highlight that track and try ripping again after cleaning the CD playing surface.

Sometimes though if CD's have been scratched there is no way to accurately transfer the affected tracks without either resurfacing or replacing the CD. And sometimes CD have defective tracks from a bad pressing or plating right out of the shrinkwrap. We've even seen brand new CD's that were already scratched when we took off shrinkwrap!

However there is another Windows program which may actually be even more accurate in terms of bit-for-bit copying than EAC, namely [dBpoweramp](#). dBpoweramp also includes "AccurateRip". While in the early days we used EAC, this is the software that we use now. For best results it is recommended to implement **Ultra Secure** ripping which can be selected in the **Secure Ripping** section. [Here](#) is a page from their website with some technical information about ripping errors. Also dBpoweramp, especially for classical music which is the most challenging genre to get the correct metadata for, is easier to use in terms of setting up folders as well as including more metadata from the GD3 and especially the Sonata databases. Here are some links for more info:

<http://www.dbpoweramp.com/Help/dMC/cd-ripper-setup-guide.htm>

<http://www.dbpoweramp.com/Help/dMC/CDhelp.htm>

<http://www.dbpoweramp.com/Help/dMC/CDhelp.htm>

<http://forum.dbpoweramp.com/archive/index.php?s=e22d9adddc1e6ff51da0fab942519586&api=1>

<http://forum.dbpoweramp.com/showthread.php?24738-Cannot-get-album-art>

Ripping in OSX

Alternatively if you wish to use an OSX Mac for ripping you can either use [dBpoweramp](#) or [XLD](#) (X Lossless Decoder).

Here at the store we use dBpoweramp which utilizes "AccurateRip" for bit-for-bit ripping. If you choose to use this software then for best results it is recommended to implement **Ultra Secure** ripping which can be selected in the **Secure Ripping** section.

For XLD here are some settings that you should know about:

- Rip as accurate as possible: **CDParanoia Mode**
- Max retry count: **100**
- Read **sample offset correction value**: (for example 667 or whatever value is most appropriate for your drive). Set automatically if possible.

- Query **AccurateRip** database to check file integrity
- Automatically save a log file: **Always**
- **Verify suspicious sectors** (may slow down ripping)
- Test before copy (half as fast): **Always**
- Scan ReplayGain

In addition there is a program called [Rip](#).

For more Mac music server info here is a [link](#).

Ripping with ReQuest

Note: If you have a ReQuest music server and you use it to do ripping, you can specify a factory-set option which will achieve the same sort of high quality transfer as Exact Audio Copy. For adding a few CD's to a collection this is fine. However for larger collections, and especially for classical music, you may wish to have them professionally transferred so that everything is done with consistent metadata across your entire collection.

Ripping with Naim

Naim has a two PDF's which contains useful technical information if you are using a Naim music server or streamer:

[Naim CD Ripping Engine.pdf](#)

[Naim Server Sound Rip Technology](#)

Metadata

With regard to music files, metadata is information about various fields such as Artist, Album, Track name, Track number, etc. However it is very important to understand that there are major differences in how metadata support is implemented in various music server applications. The most important difference to understand is between Associated Metadata and Embedded Metadata.

Associated metadata is stored in a proprietary database or file used by music server software applications. When looking at an album within the application, users will see all the information available such as album art, artists, track title etc. For example, when iTunes automatically finds album art it only associates this art with each track of the album. The problem with associated metadata is its lack of transportability. This metadata will only be available when using the specific application that associated the metadata with the files. If an iTunes library file is lost, or an application's database of associated metadata is lost, or if a file with associated metadata is moved to another application, all the metadata may gone for good.

Whereas *embedded* metadata is stored inside the audio file's container such as AIFF or FLAC. Containers/file formats such as FLAC, AIFF, or M4A (ALAC) support

embedded metadata that is readable and writable by many audio playback applications. These containers/file formats have guidelines or standards for embedding metadata and they allocate space within the container for this data. Once this metadata has been embedded into a container/file like AIFF the metadata is there until removed. None of the three problems described above are an issue with *embedded* metadata. Loss of an iTunes library file or proprietary application database or moving a file to another application have no effect on the metadata. A file with *embedded* metadata in iTunes will display album art, artist, track title etc. without manually entering anything or without iTunes gathering the metadata from an Internet database.

Therefore we highly recommend embedded metadata!

Online Metadata Databases

In case you didn't know, there are a number of online metadata databases such as:

- AMG
 - GD3
 - SonataDB - (Note: This is potentially the best database for classical music)
 - MusicBrainz
 - freedb
-

Metadata Tagging & Editing Existing Tags

Assuming that you obtain bit-for-bit file copies of your CD collection, the next most important thing is getting the tagging to be both correct and consistent. Consistency is very important—as you will find out once you start listening via your music server! If you do an absolutely perfect job with every field for each CD the first time you rip each one then you never will have to edit your metadata tags. However some people will find that they may wish to go back and edit some or all of their tags.

In order to change file and/or folder names you can go into each folder or file and hand edit each track in Windows itself using the "rename" command. In order to edit metadata tags there are a variety of programs available including:

For Windows you can use [Tag & Rename](#) to tag music files including file formats such as WAV, AIFF, FLAC, etc. And yes we have found that you can actually can tag WAV files. You can also use this program to *edit* existing Tag information. This can be especially helpful for classical music as there are more than the usual four fields (Artist / Album / Track # / Track Title) including Composer, Conductor, etc. [Note: this can be quite time consuming—especially if you have a large collection of classical music!] With jazz too you may wish to have all of the musicians listed for each album session.

Alternatively there is [Jaikoz Audio Tag Editor](#) which is another program for both adding and editing metadata. It is available for Mac OS X, Windows, and Linux.

Another very powerful program for Windows tagging and tag editing is [Musichi](#) which actually consists of 4 independent applications:

- MusiCHI Tagger
- MusiCHI Library Manager
- MusiCHI Ripper
- MusiCHI Player

Specifically MusiCHI Tagger is a very powerful piece of software and is especially useful if you have a large Classical or Jazz collection. In it you can choose between Classical and Jazz "flavors" for the metadata of those particular genres of your music library. One thing in particular that it can do is allow for global changes across all selected folders simultaneously to such fields as Composer, Artist, etc. For instance it will take all of the Composer fields and make them all identically uniform for each composer. As an example, regardless of how many different ways Mozart can be written (**Mozart, Wolfgang Amadeus** or **Mozart, Wolfgang** or **Mozart**, etc.) it would take all of the different ways of listing Mozart and make them all one way with the last name first as follows:

Mozart, Wolfgang Amadeus (1756–1791)

This powerful database approach to metadata culling and editing is really great and is highly recommended!

Note: At present there is only a Windows version. However for OSX Macs it works fine under VMWare Fusion, Parallels or Bootcamp.

Particularly if you have a large music collection you will find this multi-faceted software suite to be a very powerful timesaver and (to our present knowledge) uniquely useful.

For a native OSX Mac tagging program you can use [Tag](#).

Another program that is multiplatform for Linux/Mac OS X/Windows is [MusicBrainz Picard](#). In addition there are some [plug-ins](#) available for those who wish to try them. Here is a [review](#).

Also here is an [article](#) about some other tagging software which can create tags from file names.

Note: If you have a large collection it may end up that there will need to be a lot of correction done manually. In that case if you don't have a good keyboard for typing you might wish to obtain one. In that case [here](#) is a review of a mechanical switch keyboard that you might be interested in.

Music Files from DVD-Video, DVD-A, or Blu-ray

There is a piece of software called [DVD Audio Extractor](#) which can be utilized to extract the audio streams from a Blu-ray, DVD-Audio and DVD-Video disc. There are versions available for both Windows and Mac OSX. In addition there are two Linux versions: Ubuntu & Fedora (for which you need to use LAME).

DSD Music Files

All of the file types above are PCM (Pulse Code Modulation) type files. There is also a fundamentally different type of music file called a DSD file which is used for the SACD format. There are actually two different types of DSD file extensions: .DFF and .DSF. And they both can be either stereo or 3.0 (which is left and right front plus a center channel) or 4.0, 5.0 or 5.1 for surround. The difference is that a .DFF file has no metadata attached—whereas a .DSF file provides for full ID3V2 metadata tagging.

In case you are curious the acronym DSF stands for "DSD Stream File". For the very technically-minded here is a white paper on the [DSF File Format](#).

The easiest way to get DSD files is to download them from websites such as:

- [Acoustic Sounds Super HiRez](#)
- [HDTracks](#)
- [Channel Classics](#)
- [Blue Coast Records](#)
- [Cybele Records](#) - HD-Klassik.com (German site)
- [HighResAudio](#) - (German site)
- [DSDfile.com](#)
- [Downloads NOW](#)
- [2L](#)
- [MA Recordings](#)
- [E-Onkyo Music](#) (Japanese site)

It is also possible to extract a music file from an SACD and there are several ways of doing so. One inexpensive way is to use a Sony PlayStation3. Alternatively a more professional way is to use a Sonoma workstation which requires working in real time.

If you are interested in playing DSD files on a music server dCS has a [white paper](#) that discusses a DSD-over-USB protocol.

DOP (DSD over PCM) is what [dCS](#) is now utilizing for their DAC's. [DOP](#) packs DSD into a PCM-like signal for bitstreaming.

JRiver Media Center 18 and higher supports DOP. JRiver Media Center is music server software which is available for is Windows, Linux, and MAC.

With MC18 and newer versions DOP bitstreaming is configured in Options > Audio as follows:

- Select 'WASAPI - Event Style' in Options > Audio > Output mode (and configure 'Output mode settings...' as necessary)
- Select Options > Audio > Bitstreaming > Custom... and check _only_ 'DSD over PCM (DoP)'
- Customize the 'DoP Format' if you have an older device that does not support the DoP standard

For more information on downloading and playing DSD files click [here](#).

Note: As of 2015 in our soundrooms here at the store we are using [Baetis Music Servers](#) which come set-up with JRiver Media Center running on Windows. The best way to play DSD software on the Baetis music servers is to either pre-convert the files to 176.4/24 or to set-up on-the-fly transcoding. This way if you are using the Baetis Reference music server you can use the AES-EBU digital outputs for all stereo recordings as the AES-EBU outputs offer the best sound quality. Alternatively if you are using a Baetis music server without AES-EBU you can use their SP-DIF outputs in stereo 2-channel mode.

Data Redundancy & Backup

It is **very** important to have a good backup scheme for your precious music files. The best approach is to employ redundancy and as well as both onsite and offsite backup.

We recommend using either RAID 1 or RAID 6 for redundancy on your music server or NAS (network attached storage) unit. For a NAS there are also proprietary alternatives such as XRAID (Netgear) or SHR (Synology). In addition to the RAID redundancy you should also have **at least one** external backup of your music files. Ideally you would also have **at least one more** backup offsite! Two onsite backups (in addition to the original which totals 3 on-site copies) as well as one or two offsite backups is the best way to go.

An excellent way of having an off-site backup is to utilize Co-location. One way to do this is with two Synology NAS boxes with each at a different location. Another Colo alternative is the Cloud.

If you care about quality it can be a tremendous amount of work to rip a whole library of 100's or 1000's of CD's—really you simply won't believe how many hours it can take until you try it for yourself! So make sure that you do it right the first time and back it all up properly!

How much time does it take to transfer a CD collection?

It depends on whether you have a few dozen CD's in which case it probably won't take too long. If you have 100's or 1000's or more then it might well take quite a bit of time. There are a number of aspects to consider including the quality of the data ripping (bit-for-bit is important!), the metadata editing, the album art, the learning curve, etc. If you have a larger collection and decide to do it yourself you will probably spend far more time ripping and organizing your CD collection than you would ever imagine—especially if you wish to do a high quality job! If you are retired and wish to make this a hobby or if you have plenty of spare time in the evenings and weekends and wish to use your time to do this then by all means go right ahead. If you are unsure whether you wish to tackle this yourself then you could try doing some CD's yourself and see how you feel. Make sure that you test out your results in whatever music server software you are using before you do too many CD's as you don't want to have to redo your entire collection once you learn how you would rather have done it!

Unless you have plenty of free time though, it is recommended that you bring in or ship your CD collection to us and have it professionally transferred with proper searchable metadata and album art. After all time is a precious commodity!

Where can I obtain a robotic 100 CD autoloader?

If you would like to rip your collection yourself and would like to get a robotic autoloader here is a link:

<http://www.getdigitaldata.com/ProductNimble.aspx>

However please note that this still requires a hands-on approach. In other words you can't just necessarily walk away and have 100 discs be ripped automatically. Especially if you have classical music in your collection you still should look at the metadata for each CD before ripping each one—otherwise you may have to go back and hand-edit some or all of them. So having a CD autoloader may not be the big timesaver that one might assume.

How much does it cost to have a CD collection professionally ripped?

Using any type of lossy compressed format (MP3, AAC, WMA, etc.) would not be our recommendation for home use in a quality audio system--as lossless or uncompressed would definitely be better! However if you wish you can get your collection dual-encoded so that you have a portable version using either lossy or lossless compressed files--as well as either a lossless compressed or uncompressed file format for home use.

Our recommendation of course would that you only have your music transfers done as true bit-for-bit copies for home use. For the format we usually recommend either WAV or AIFF as hard disk and SSD space has become quite inexpensive so there is no reason to even go lossless anymore. Alternatively you can also use Uncompressed FLAC which is a lossless uncompressed format. WAV is of course the same file format as the CD. However both AIFF and FLAC may be better in terms of metadata. Although we have had excellent results with dBpoweramp ripping to WAV. More information about this is available [here](#).

If you have an Apple Mac computer we would recommend using AIFF. The nice thing about this choice is that AIFF files work fine on Windows machines too.

If you are using a Windows machine then WAV, AIFF or FLAC are all possible to use. AIFF, which is Apple's version of WAV, can be a good however you should make sure that the music server software that you wish to use supports AIFF. Examples of Windows (both 32 and 64 bit) music server software that does support AIFF are [JRiver](#) and [Sonata](#).

Over the years we have had plenty of experience with various ripping services and have not always been satisfied with the results. However the pricing below reflects having a top-quality professional job being done:

Standard Ripping

Lossy Compressed \$0.99 per CD (MP3 192kps or lower) (Note: no cover art included)

Lossy Compressed \$1.95 per CD (MP3, AAC, WMA)

Lossless Compressed \$2.50 per CD (FLAC, ALAC, WMA-L)

Uncompressed \$2.75 per CD (WAV, AIFF)

Bit For Bit Transfers

Non-Classical \$3.75 per CD (Uncompressed: WAV or AIFF - Or Lossless Compressed: FLAC, ALAC, or WMA-L)

Classical \$4.50 per CD (Uncompressed: WAV or AIFF - Or Lossless Compressed: FLAC, ALAC, or WMA-L)

Extended Classical Editing \$4.95 per CD (Uncompressed: WAV or AIFF - Or Lossless Compressed: FLAC, ALAC, or WMA-L)

Note: Typical metadata fields include:

- Artist
- Album
- Track Title
- Track Artist
- Track #
- Genre
- Year
- Cover Art (assuming that the Jewel Cases are included with the cover inside)

Note: Extended Classical Editing also includes all of the typical fields above plus the following additional fields:

- Composer
- Conductor
- Most Notable Soloist

Also please note that the Extended Classical Editing would be done by a trained, performing Classical musician/opera singer who speaks 5 languages (French, German, Italian, etc.) These projects must be booked in advance and if the need arises we can arrange a telephone conversation or a [GoToMeeting](#) session to go over special projects in order to ensure that you understand the process and that the final results will meet your requirements.

Note: All of the above options include high quality cover art. Typically cover art will be anywhere from 600x600 to 1000x1000.

Note: The above pricing may not be current as pricing may change over time. Also any applicable shipping charges would be extra.

If you have any questions about having your collection professionally ripped please call us at 781-893-9000.