



Higham and Rushden

Registered Charity Number 1164952

Ripping and Burning

(or getting stuff on and off discs)

Ripping is the process of extracting music, data or video from a commercial audio CD, DVD or Blu-Ray (BD) disc to your computer.

Burning is the process of transferring any type of data from your computer to a CD, DVD or BD disc.

Before we look at how to rip and burn, there are a few basics we need to understand. Optical discs such as CDs, DVDs and Blu-Ray are generally one of:

- Commercially mastered audio CDs
- Commercially mastered video DVDs and Blu-Ray discs.
- Data CDs (such as those supplied with computer hardware or software).
- Blank discs of all 3 types (CD, DVD & BD) on which to burn data.

We also need to consider the practicability of transferring data to and from a disc: to do so the computer needs to have an optical drive, either built-in or attached by USB. Modern laptops, particularly those with smaller screens, tend not to have internal optical drives.



Optical drives come in 2 general types: those which can only read information on a disc and those which can also write information to the disc. The drives in your music system and the DVD player under your TV are almost certainly read-only and are unlikely to be able to write to the disc.

Almost all optical drives fitted to modern computers are able to write data to both CDs and DVDs, and both internal and external drives can be found which can write to BD, DVD and CD.

We will not cover copying video in this tutorial as it is a hugely more complicated subject than audio, often requiring several different software programs, and also because copying commercial DVDs can lead to prosecution!

An optical disc is designed to support one of three recording modes: read-only, recordable (write-once), or re-recordable (rewritable). The discs themselves will normally be labelled with a suffix as follows:

ROM	Read-only
-R or +R	Recordable
-RW or +RW	Rewritable
-RE	Blu-Ray equivalent of RW
-RAM	Rewritable

DVD-RAM discs can be recorded and erased repeatedly but are compatible only with devices manufactured by the companies that support the DVD-RAM format. DVD-RAM discs are typically housed in cartridges.

There are a few other things to bear in mind when looking into recording optical discs. Recordable and rewritable DVD discs come in both plus and minus varieties. These use slightly different technologies for burning data to the disc but 99% of today's DVD writing drives will work with both types.

DVD-R, DVD-RW AND DVD-RAM formats are supported by Panasonic, Toshiba, Apple, Hitachi, NEC, Pioneer, Samsung and Sharp.

DVD+R and DVD+RW formats are supported by Philips, Sony, Hewlett-Packard, Dell, Ricoh, Yamaha and others.

Some DVD and BD discs can record data in 2 layers for extra capacity: these have the suffix DL for dual layer. Some more recent BD discs are able to record to 3 or even 4 layers and have the suffix XL.

What can we store on an optical disc?

Virtually any digital file type, up to the capacity of the disc. The table on the right shows the limits for each disc type from the smallest to the vast.

Disc type	Capacity
CD (data)	737 MB
CD (wav audio)	80 minutes
DVD (single layer)	4.7 GB
DVD (dual layer)	8.5 GB
Blu-Ray (single layer)	25 GB
Blu-Ray (dual layer)	50 GB
Blu-Ray BDXL	100-128 GB

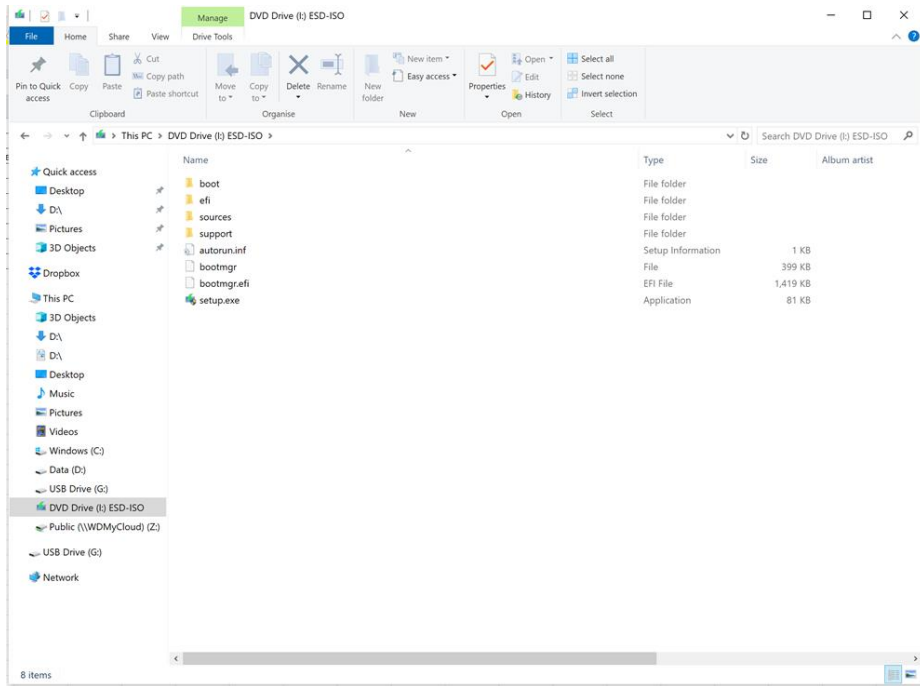
Some of you may remember floppy discs which in the early days of computing were THE way to transfer data between computers. They stored 1.44 MB!

Each optical drive can normally read the lower format optical discs. For example a DVD drive can read CDs as well as DVDs, but cannot read BD discs.

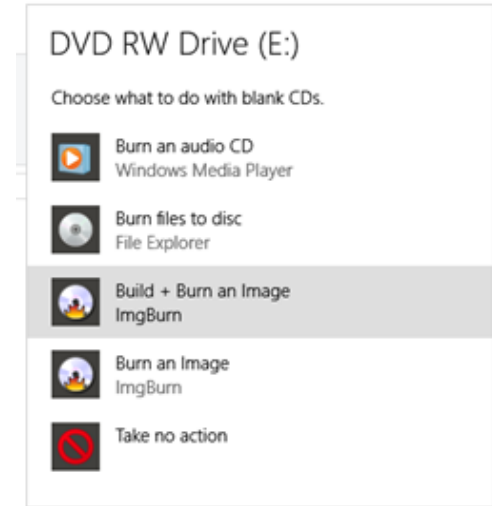
The complete list according to Dell is as follows:

DRIVE TYPE	BOUGHT CD	CD-R DISC	CD-RW DISC	BOUGHT DVD	DVD-R/RW	DVD+R/RW	BOUGHT BD	BD-R DISC	BD-RE DISC	BD-R (DL)	BD-RE (DL)
CD-ROM	Read Only	Read Only	Read Only								
CD-R	Read Only	Read & Write	Read Only								
CD-RW	Read Only	Read & Write	Read & Write								
DVD-ROM	Read Only	Read Only	Read Only	Read Only	Read Only	Read Only					
DVD-R	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read Only					
DVD-RW	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read Only					
DVD+R	Read Only	Read & Write	Read & Write	Read Only	Read Only	Read & Write					
DVD+RW	Read Only	Read & Write	Read & Write	Read Only	Read Only	Read & Write					
BD-ROM	Read Only	Read Only	Read Only	Read Only	Read Only	Read & Write	Read Only	Read Only	Read Only	Read Only	Read Only
BD-R	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read Only	Read Only	Read Only
BD-RE	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read Only	Read Only
BD-R (Dual Layer)	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read Only	Read & Write	Read Only
BD-RE (Dual Layer)	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read Only	Read & Write	Read & Write	Read & Write	Read & Write

We will look first at data CDs. Data on these can usually simply be copied and pasted (or dragged and dropped) from the optical drive to other folders on your computer using File Explorer.



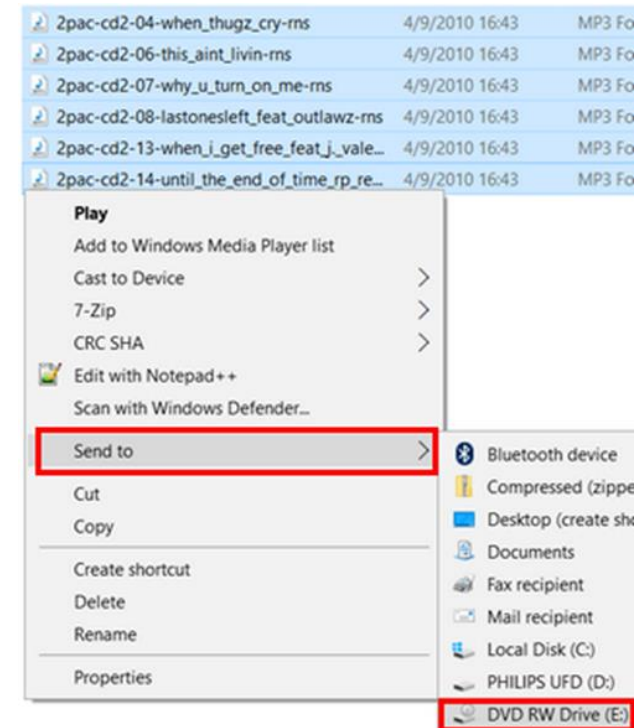
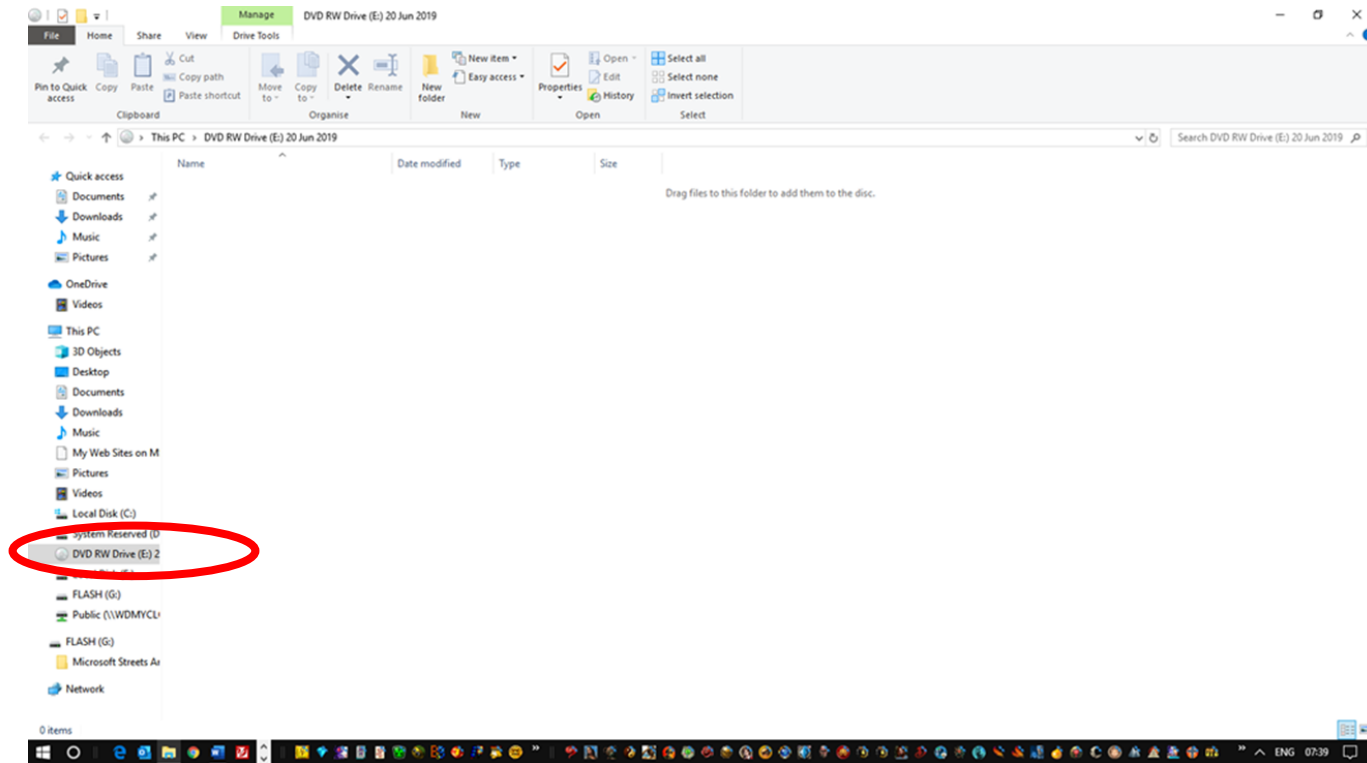
The first time you put a disc (blank or not) in your computer, you will probably see a message like this:



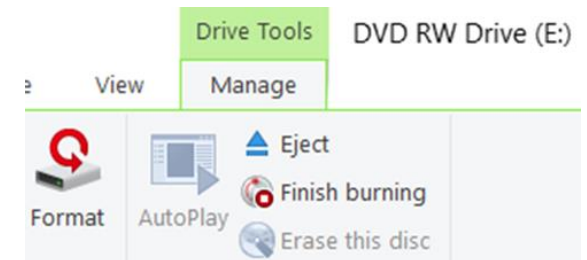
The File Explorer option is probably the best.

The process works in a very similar way when adding (“burning”) data to a disc and we will look at this on the next slide.

The blank disc will be visible in File Explorer, and for ordinary data files including your own digital music files you can simply copy or drag them to that disc. If the files are all together you can also select them all then right-click and choose “Send to”.



Once File Explorer shows that all the files you want to include on the disc are present, you need to complete the process and actually “burn” them to the disc. Select the blank disc in File Explorer and choose the burn option under “Drive Tools”.



Ripping audio from CD

For this you need a ripping program, many of which exist from free to quite expensive, but perhaps the easiest to use is already part of Windows: Windows Media Player. This may open automatically when you insert a music disc into your computer, but if not you can open Windows Media Player (WMP) which should recognise the disc at once.

Before we explore how to use WMP we need to discuss file compression (yawn) so that you can decide in which format to save the music you are taking from the disc.

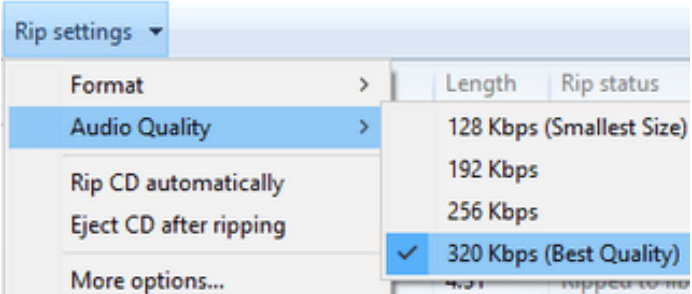
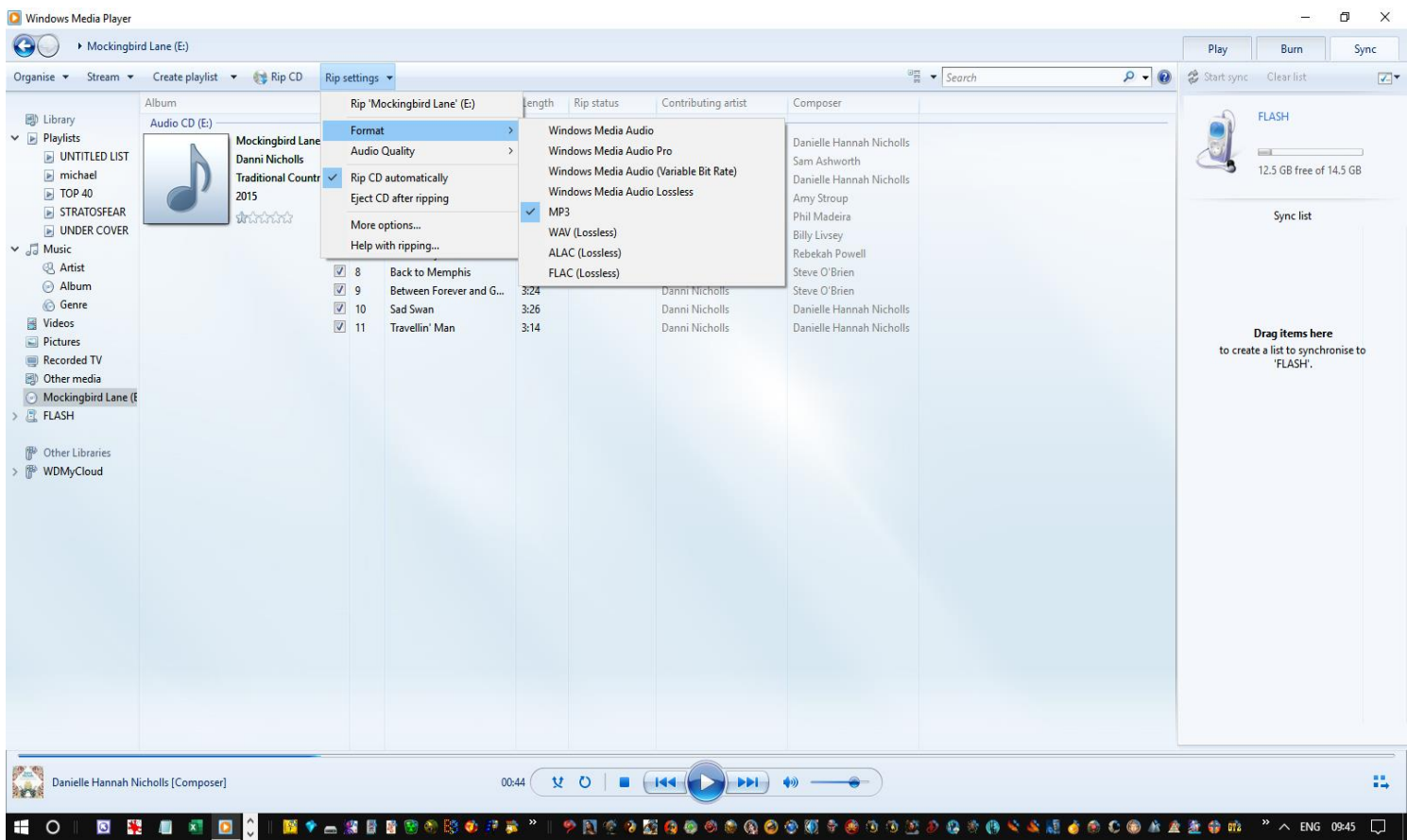
File type	Compression	Notes
Lossless:		
.wav	100.00%	All CD players will read these
.flac	61.05%	
.ape	59.61%	
Lossy:		
.ogg	N/A	
.mp3	N/A	Most widely used format
.mp4, .m4a	N/A	
.wma	N/A	Only Windows, generally

If you just want to keep the music on your computer then you can save it in any format you choose (and which your computer can play back). The chart on the left shows that .wav files are the largest “lossless” type, meaning that they have no loss of quality. Music aficionados like the .flac and .ape formats as they maintain original quality while taking up less space on the computer’s hard drive, but .mp3 is far and away the most widely-used format and can be understood by almost all portable music players and many CD players. The files are also usually small enough to e-mail, but be warned that doing so may render you liable to prosecution for breach of copyright.

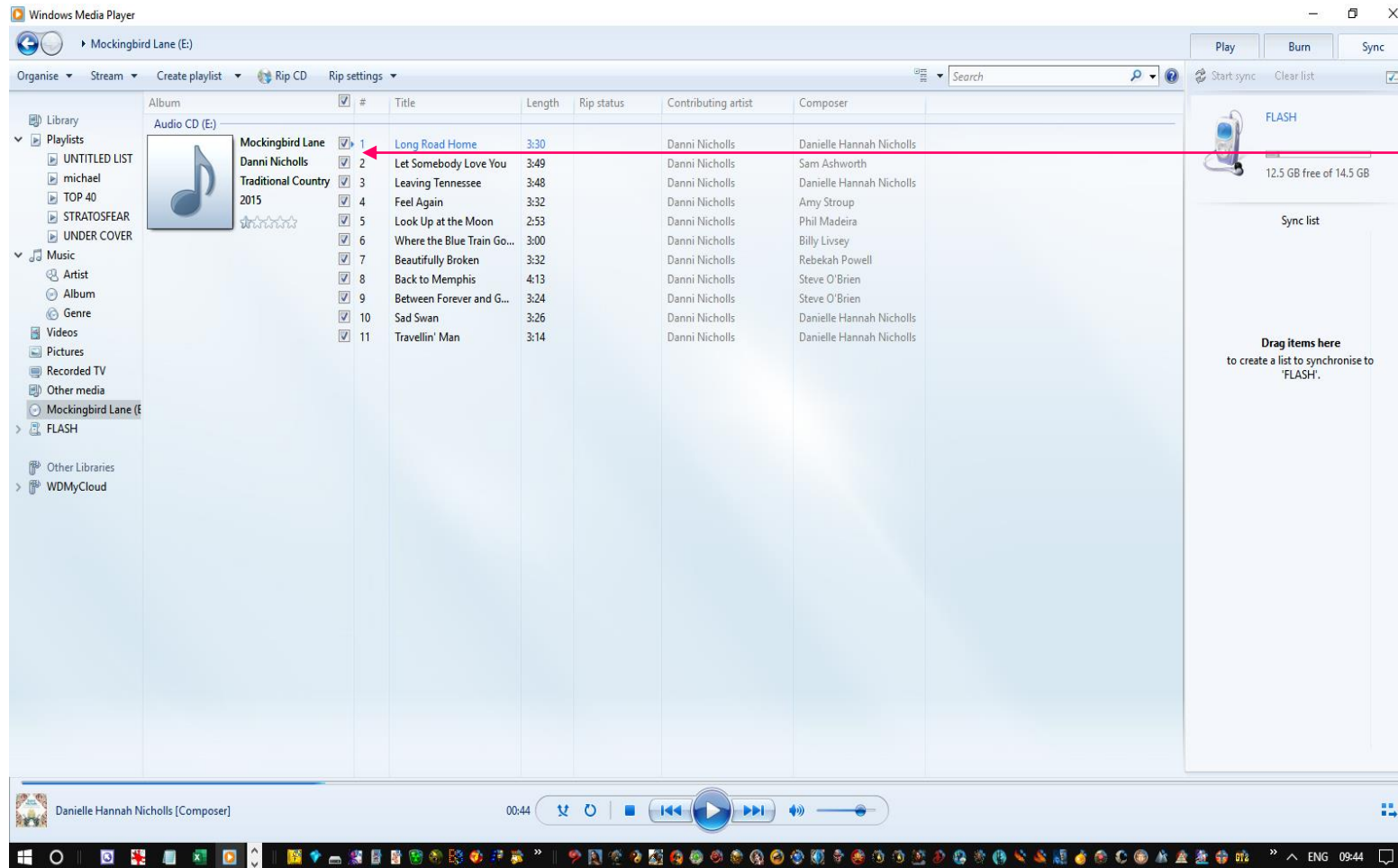
Windows Media Player is very good but until you tell the player which file format you want, it creates WMA files — a format that won't play on iPads, most smartphones, nor many other music players.

When you first insert an audio CD click on “Rip settings”, then “Format”, and select your preferred format.

If you choose mp3 it is also worth clicking on “Audio Quality” and choosing something other than the smallest file size unless space is very tight.



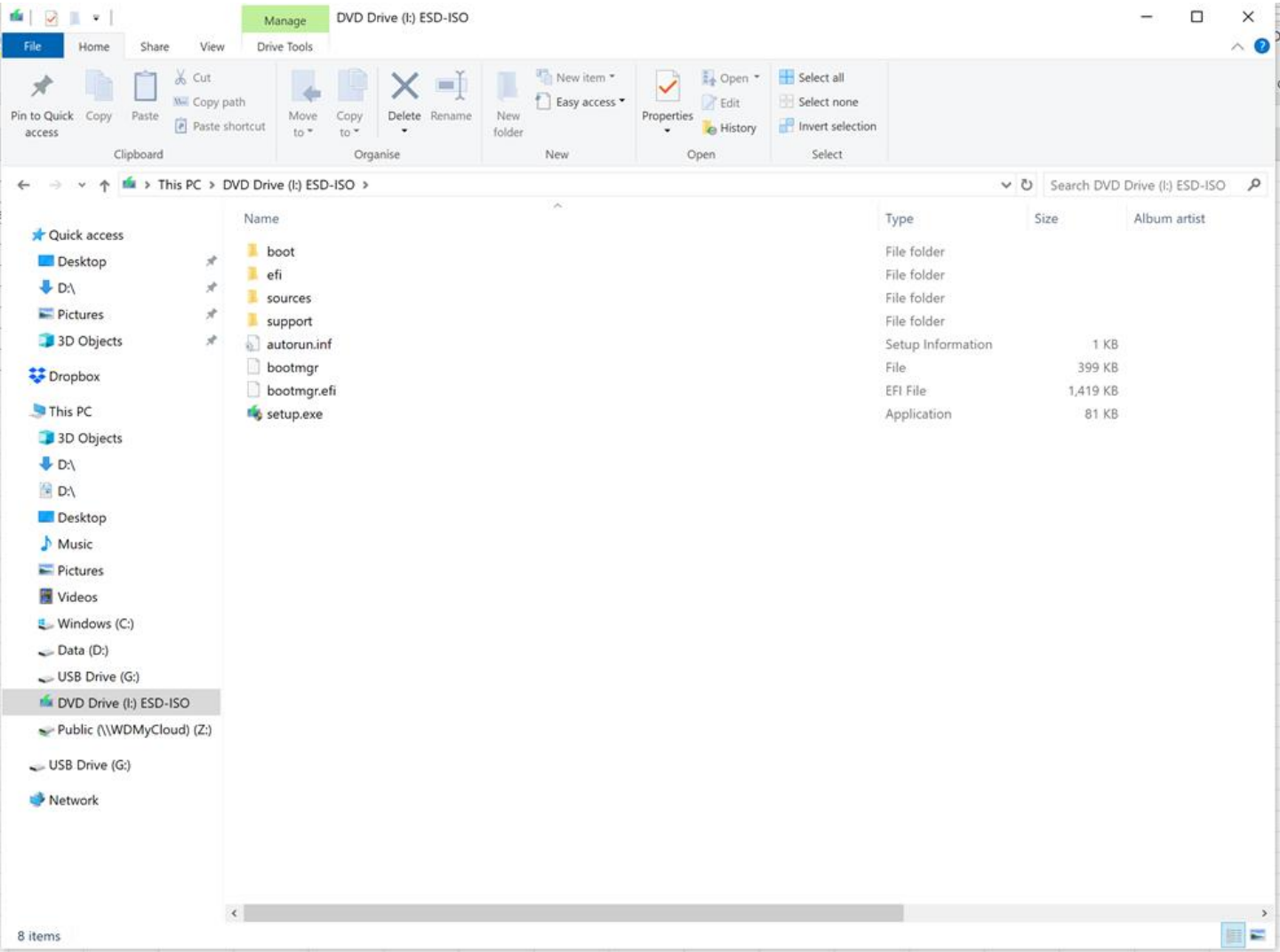
Windows Media Player normally connects to the Internet, identifies your CD, and fills in the album's name, artist, and song titles. Once you have configured your settings, click on "Rip CD" and the program will begin copying the CD's songs to your PC and listing their titles in the Windows Media Player Library.



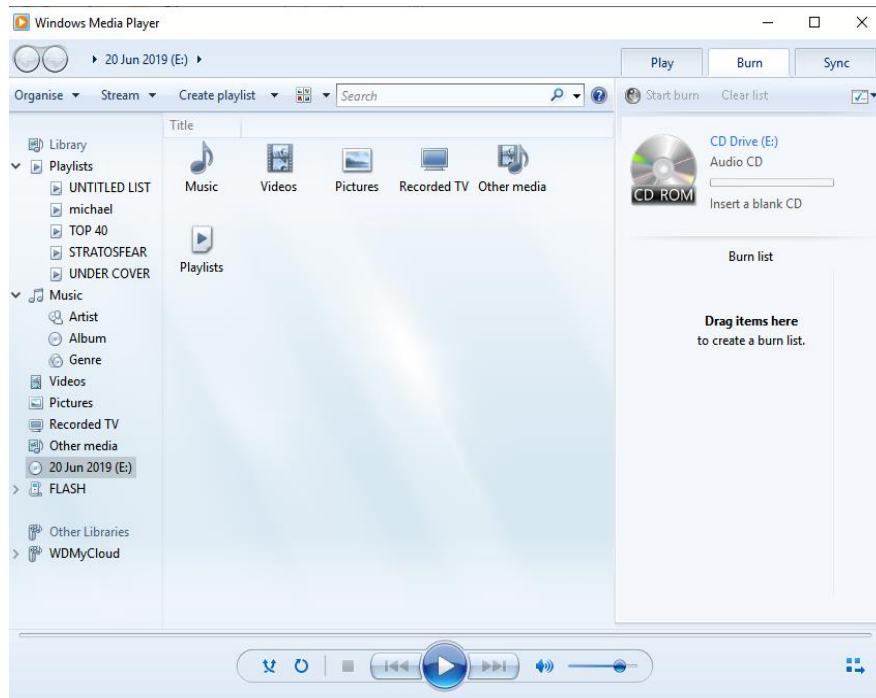
If there are songs on the CD which you do not want, you can deselect them using the tick boxes here (which are likely to be ticked already).

If the boxes are not ticked (for example if you have previously ripped the CD in a different format) you will need to select them individually or by using the "select all" button (not labelled as such).

Audio CDs created other than by the music industry can contain music files such as wav, flac and mp3. These can usually simply be copied and pasted from the optical drive to other folders on your computer in the same way as data files such as Word documents and all image types.



If you want to be sure that your audio CD will work on most CD players, Windows Media Player will accept most formats of audio files and convert them into a format which will be almost universally playable.

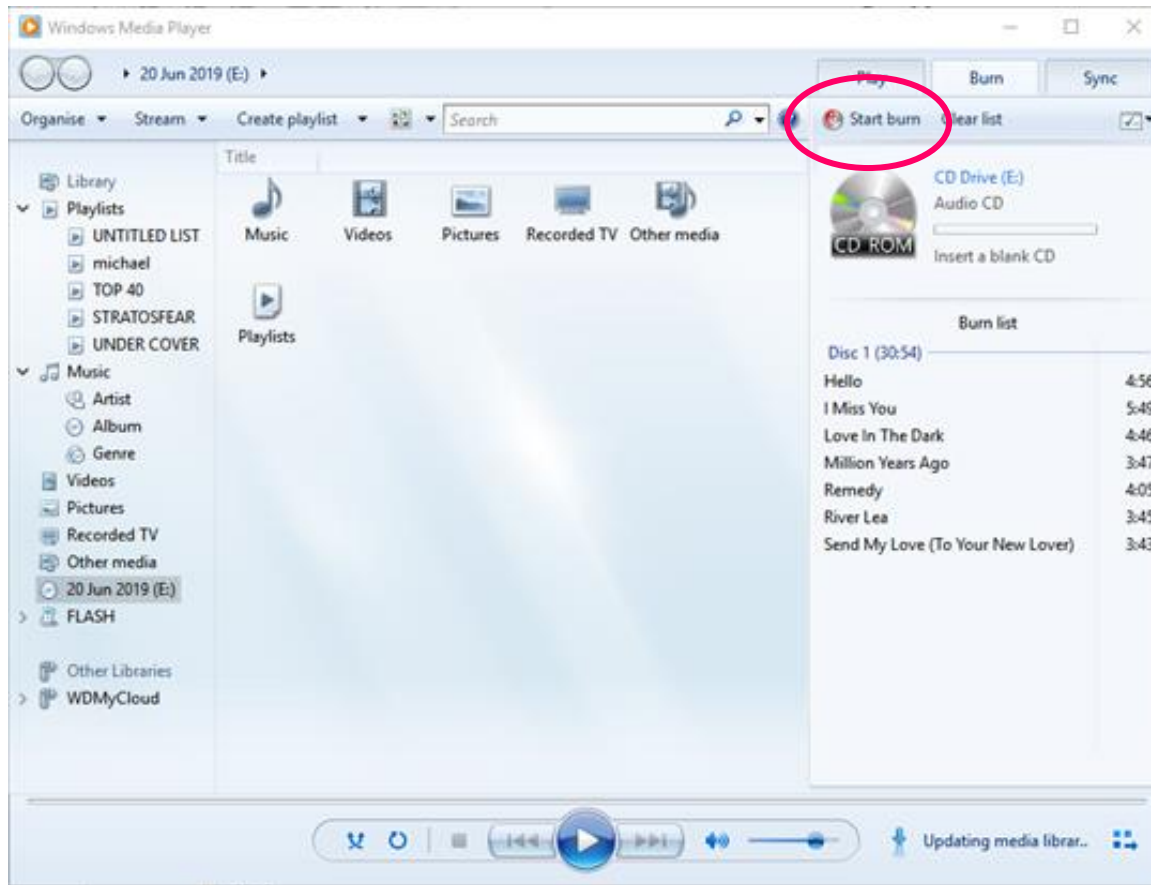


When you open WMP with a blank CD inserted in your computer, the window on the left should be visible. Drag your tracks to the “Burn list” area on the right. As you add them, WMP calculates the total playing time as shown below:

Burn list	
Disc 1 (30:54)	
Hello	4:56
I Miss You	5:49
Love In The Dark	4:46
Million Years Ago	3:47
Remedy	4:05
River Lea	3:45
Send My Love (To Your New Lover)	3:43

If the total exceeds 80 minutes WMP will start a section for a second disc.

{If your selection of tracks works out at just over 80 minutes, it is probably best to cancel one track (right-click and delete) rather than creating a second disc with only 1 track.}



Once all the tracks are ready, click on “Start burn”, circled in red in the picture on the left, to start burning the tracks to your blank disc. The process normally only takes a few minutes.

THE END

Additional recommended resources:

A free program called ImgBurn allows you to create copies of CDs and then burn them to another CD by creating image files (which can also be used on your computer just like a CD). Be aware, however, that doing so may well be illegal.