

**Sun City Summerlin Computer Club
Seminar**

Digital Music 2020

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Agenda

- **Basics of *Digital* Music**
- **Audio & Video File Formats and Standards**
- **Building Your Music Collection**
- **Cleaning up and editing recorded music**
- **iTunes Tutorial**
 - Ripping Music CDs
 - Organizing Your Music Library
 - Burning Music CDs
 - Downloading Music to Your Hand-held
 - Internet Radio
- **Streaming Media Services**
- **Useful Web Links for More Information**

Basics of *Digital Music*

- **Music is represented as a stream of numbers.**
 - Measurements of recorded electrical voltage level at an instant.
 - Generally use 16 bits (2 bytes) per measurement (sample).
 - For stereo, two streams – one for each channel (left / right).
 - Standard audio CD sample rate is 44,100 times per second.
 - Can later convert the stream of numbers back to voltages.
- **Number stream may be saved in various ways**
 - On an audio CD.
 - In a music file on a PC hard disk (.WAV, .MP3, .FLAC or .AAC)
 - Music files may be compressed in various ways or left uncompressed.
- **Let's look at a .MP3 file with Audacity Music Editor**

Audio File Formats (1)

- **Microsoft WAVE (.WAV)**
 - 44,100 samples/sec, stereo, 16-bit samples each channel.
 - Each 16-bit value can range from -32768 to + 32767.
 - Uncompressed, consumes about 10.6 MBytes per minute of sound ($44,100 * 2 * 2 * 60$).
 - True audio CD Quality (same specs).
- **Motion Picture Experts Group 1 - Audio Layer 3 (.MP3)**
 - Compressed, size varies based on sample rate.
 - .MP3 is “lossy” – removes very high and low frequencies.
 - 256 Kbits/sec (Music store quality), 64 Kbits/sec (FM quality).
 - At 256 Kbits/sec, uses about 2 MB per minute of sound (20% of .WAV).
 - Little point in going higher than 256 Kbits/sec for MP3.

Audio File Formats (2)

- **Microsoft Windows Media Audio (.WMA)**
 - Compressed, size varies based on sample rate.
 - Supports Digital Rights Management standards.
 - MS claims files about half the size of .MP3 files. (*My experiments didn't confirm that*).
- **Apple Advanced Code (.AAC)**
 - Compressed, size varies based on sample rate.
 - Supports Digital Rights Management standards.
 - Proprietary to Apple.
- **Other Formats:**
 - Free-Lossless (.FLAC), Ogg-Vorbis (.ogg)
- **More Information**
 - <http://ekei.com/audio>

Building Your Own Music Library

- **Convert *your* music CD collection to music files.**
 - Use iTunes or any of the many other popular CD “rippers”.
- **Buy “used” CDs (save about 50%) to rip.**
- **Borrow music CDs to rip?**
 - From friends, public library.
- **Use the Library’s Freegal music service (6 songs / week)**
- **Buy digital music on-line (unlocked MP3 files).**
 - \$.99 per song, \$9.99 per “album” (sometimes less)
 - Amazon.com and iTunes.com are now the biggest.
- **Record Internet streaming audio**
 - Use a tool like Total Recorder
- **Convert your old analog audio tapes and LPs to music files.**
 - Need a “line-in” recording tool (e.g. Spin It Again or GoldWave).
 - After recording, need to separate and “clean-up” the recorded sound.

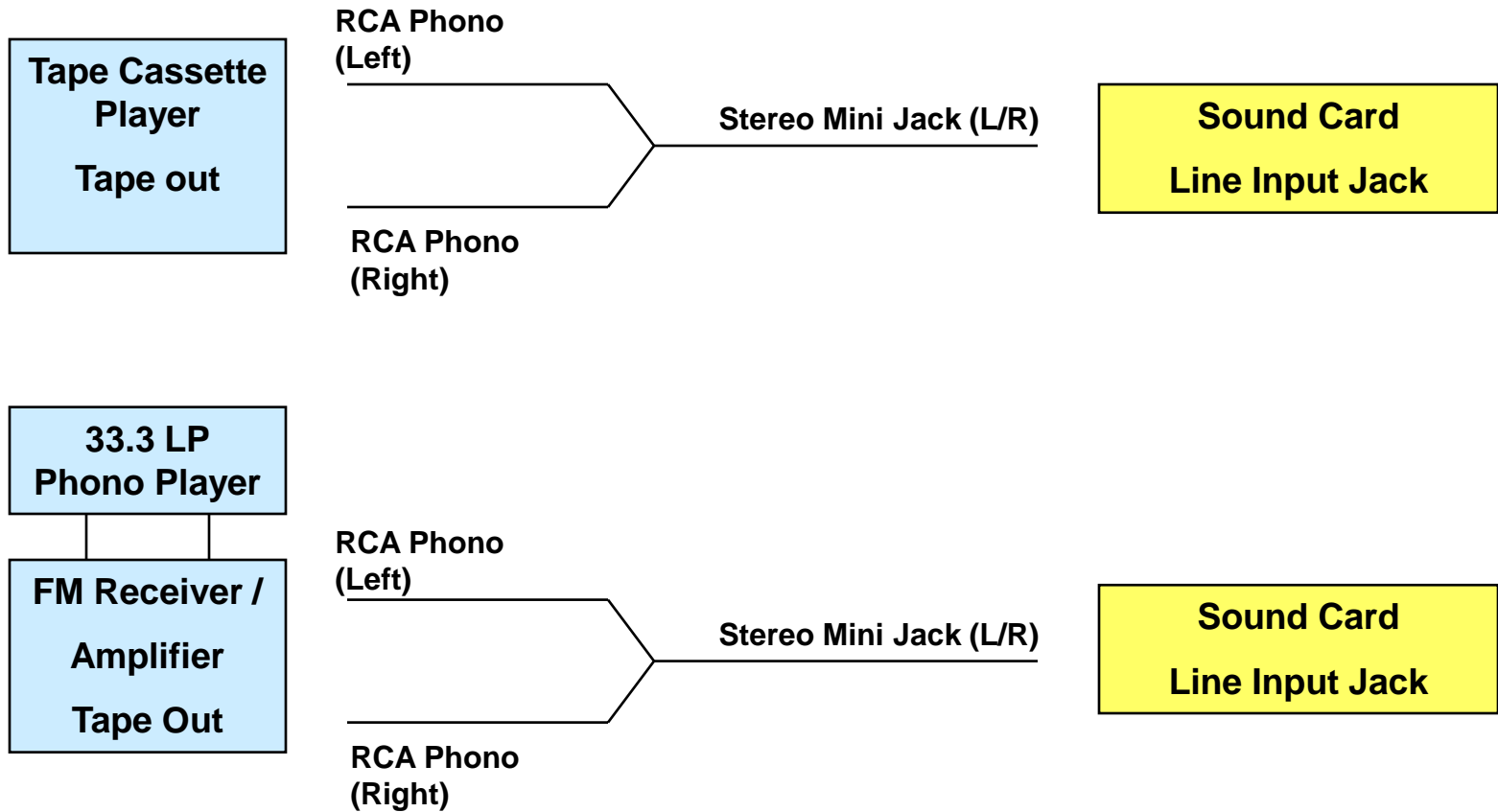
CD Rippers

- **Ripping (Definition)**
 - Copying contents of an Audio CD to your hard disk.
 - Digital audio data is converted to: .WAV, .MP3., .WMA or .AAC
 - Often audio album, artist and track information looked up in an Internet CD Database (CDDB).
 - Legal, fair *personal* use of copyrighted material you own.
- **Many CD rippers available (shareware, freeware, jukeboxes).**
 - iTunes is very easy to use for ripping.
 - Easy – Place CD in your CD drive and “rip away”.
 - Ripped files can go in any folder – usually “My Music”.

Demo - Ripping An Audio CD

- We'll use *iTunes*, but Media Player or FreeRip can also rip audio CDs.
- **First - Get Your Settings Right (Only need to do this once):**
 - Click Edit > Preferences. Then click “Import Settings”.
 - Choose Import using MP3 encoder in the drop down.
 - For setting, click “Custom”. In the popup dialog, choose “256 kbps”.
 - Click OK as needed to get back to the main preferences screen.
 - Click the Advanced tab.
 - For “iTunes Media Folder Location”, click Browse and choose the folder on your hard drive where you want ripped songs to go.
 - Click OK as needed to exit the Preferences dialog.
- **Insert the audio CD to be ripped.**
- **iTunes will ask if you want to import. Click “Yes”**

Converting Audio Tapes and LPs



Free Digital Music Editors

- **GoldWave (Shareware)**
 - Does line-in recording
 - Full-featured music editor
 - <https://www.goldwave.com/goldwave.php>
- **Audacity (Open Source)**
 - Does line-in recording
 - Full-featured music editor
 - <https://www.audacityteam.org/download>

What Are Music Library Programs?

- <https://windowsreport.com/music-library-software>
- Most support a Music Library to organize your music. Can “import” files and folders into the library.
- Most support ripping to MP3 files from Audio CDs.
- All can play CDs and music files back through your sound card.
- Can usually convert between some file formats.
- Can often burn new audio or MP3 music CDs with a custom mix of your favorite tracks.
- Most now support on-line music radio streams.
- Most now support on-line music stores for downloads.

Popular Music Library Programs

- **Microsoft Windows Media Player – Free (Good)**
 - **Bundled with Windows**
- **iTunes – Free (Now in Microsoft Store)**
 - <https://www.microsoft.com/en-us/p/itunes/9pb2mz1zmb1s?rtc=2&activetab=pivot:overviewtab>
- **MediaMonkey – Free (good) & Paid (\$25, excellent)**
 - <https://www.mediamonkey.com>
- **VideoLan VLC –Free (audio and video player / converter)**
 - <https://www.videolan.org>

Organizing Your Music Library

- **Physical Placement of your music files.**
 - Folder and file hierarchy important.
 - Best is Artist > Album > Song name.
 - Default location is your personal “My Music” or “Music” folder.
 - If have two hard drives, consider placing on the non-boot drive.
- **Use a Music Library program to *index* your files into a Library.**
- **Set up Descriptive “tags” in music files**
 - Artist name, song name, album name, genre, date
 - Tedious work. But, once done, these are recognized by all players and Music Library programs.
- **Adjust physical file names based on tags.**

Adding Files to Library / Editing Tags

- We'll use *iTunes*; Media Player, MediaMonkey also work.
- **Demo – Add Files to an iTunes Library / Edit Tags**
 - File > Add Folder to Library
 - Browse to the Top-level folder containing the Files and Folders you wish to add.
 - Click “Select Folder”.
 - iTunes will scan and index the collection and build the library, indexed by Genre, Artist, Album and Song Title.
- **Demo – Edit the tag information for a set of MP3 files.**
 - Click the “Songs” button (or you can select a playlist)
 - Select one or a set of files by clicking, shift clicking, right clicking.
 - Right click on the file or set and then select “Get Info”.
 - Click the Info tab in the dialog that appears.
 - Make changes as needed and then click OK to save the changes.

Demo – Downloading MP3s

- **Can use iTunes to download to iPhone, iPod, iPad**
 - <http://ipod.about.com/od/ipad/qt/download-music-to-ipad.htm>
 - <http://www.aimersoft.com/tutorial/transfer-itunes-music-video-on-ipad.html>
- **Demo – Download an iTunes Play List to a Flash Drive**
 - Plug in your flash drive to a USB port.
 - Select or create a Play List (see previous slide).
 - Sort or order the playlist to suit.
 - Select All (Ctrl+A) of the files and then right click and select Copy.
 - In File Explorer, navigate to the flash drive, right click and select Paste.
- **Download an iTunes Play List to an Android Hand-held.**
 - Plug in your Android device to a USB port.
 - Windows will “mount” in File Explorer.
 - Follow the steps above for copying to a flash drive.
Paste the selected files into the Android Music folder
 - Or ... copy the music files to a micro-SD card and plug it in to your device.

Streaming Music Services (1)

- <https://www.consumerreports.org/streaming-music-services/best-music-streaming-service-for-you/>
- Amazon Prime Music (Free with a Prime subscription) or Amazon Music Unlimited (\$8 monthly)
 - <https://www.amazon.com/music>
- Apple Music (\$10 / month)
 - <https://www.apple.com/apple-music>
- Napster (\$5 and \$10 monthly)
 - <http://us.napster.com>
- Pandora (Free, \$5, \$10 monthly)
 - <http://www.Pandora.com>

Streaming Music Services (2)

- **Spotify (free & \$10 monthly)**
 - <https://www.spotify.com/us/>
- **YouTube Music (free & \$10 per month)**
 - <https://www.youtube.com/musicpremium>
- **Shoutcast (Internet Radio stations)**
 - Available via iTunes & other Music Library programs
- **Sirius XM - Satellite radio (\$17 / month)**
- **Music channels on Cox, DirecTV & Dish (Bundled)**

Where To Find Music & Videos

- <http://www.emusic.com/>
- <http://www.amazon.com>
- <http://www.walmart.com>
- <http://www.freekaraoke.com/>
- <http://www.freemidi.com/>
- <https://play.google.com/store/music?hl=en>

Other Useful Web Links

- <https://electronics.howstuffworks.com/cd.htm>
- <https://www.audacityteam.org/download/>
- <https://www.goldwave.com/goldwave.php>
- <http://download.cnet.com/windows/>
- <http://www.roxio.com>
- <https://www.nero.com/enu/>
- <http://www.itunes.com>
- <http://www.videolan.org>
- <http://www.microsoft.com>
- <http://www.ashampoo.com>
- <https://acoustica.com/products/spin-it-again>