Sun City Summerlin Computer Club Seminar

Digital Media 2017

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<u>Agenda</u>

- **Basics of *Digital* Music and Video**
- **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**
- **Video Editing Tools**
- **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.**
  - **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 or .AAC)**
  - **Music files may be compressed in various ways or left uncompressed.**
- **Let's look at a MP3 file with GoldWave Music Editor**

<u>Basics of *Digital* Video</u>

- **A digital video is represented as a stream of frames.**
  - **Each frame is an image with up to 2 million pixels (HD) or 8 million pixels (UHD).**
  - **Video displays 30 or 60 frames per second (like a really fast slide show).**
  - **Sound track is also included as 2 to 8 channels of audio.**

- **To achieve manageable file sizes, video is compressed.**
  - **Mpeg Level 2 is video compression – about 55 to 1.**
  - **Possible because from one frame to the next, there is very little change.**

- **Video, sound and other content can all be stored in a single "container file"**
  - **.MOV, .AVI, .MP4, H.264 and others**

- **Video can also be stored as a structured set of files on a Video DVD or Blu-ray disc.**

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).**
  - **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.**
  - **128 Kbits/sec (near CD quality), 64 Kbits/sec (FM quality).**
  - **At 128 Kbits/sec, uses about 1 MB per minute of sound (10% 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. (*Our* 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:**
  - **Ogg-Vorbis (.ogg), Free-Lossless (.FLAC)**

- **More Information**
  - **http://ekei.com/audio**

Vidio File Formats

- **http://imagenevp.com/top-10-video-formats/**
- **Mpeg 1 & Mpeg 2**
- **H.264**
- **Motion Picture Experts Group (.MP4)**
- **Quicktime (.MOV)**
- **Microsoft (.WMV and .AVI)**
- **FLV (Adobe Flash)**

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.**
- **Buy digital music on-line.**
  - **$.99 per song, $9.99 per "album" sometimes less)**
  - **Most stores now sell "unlocked" MP3 files.**
  - **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.**
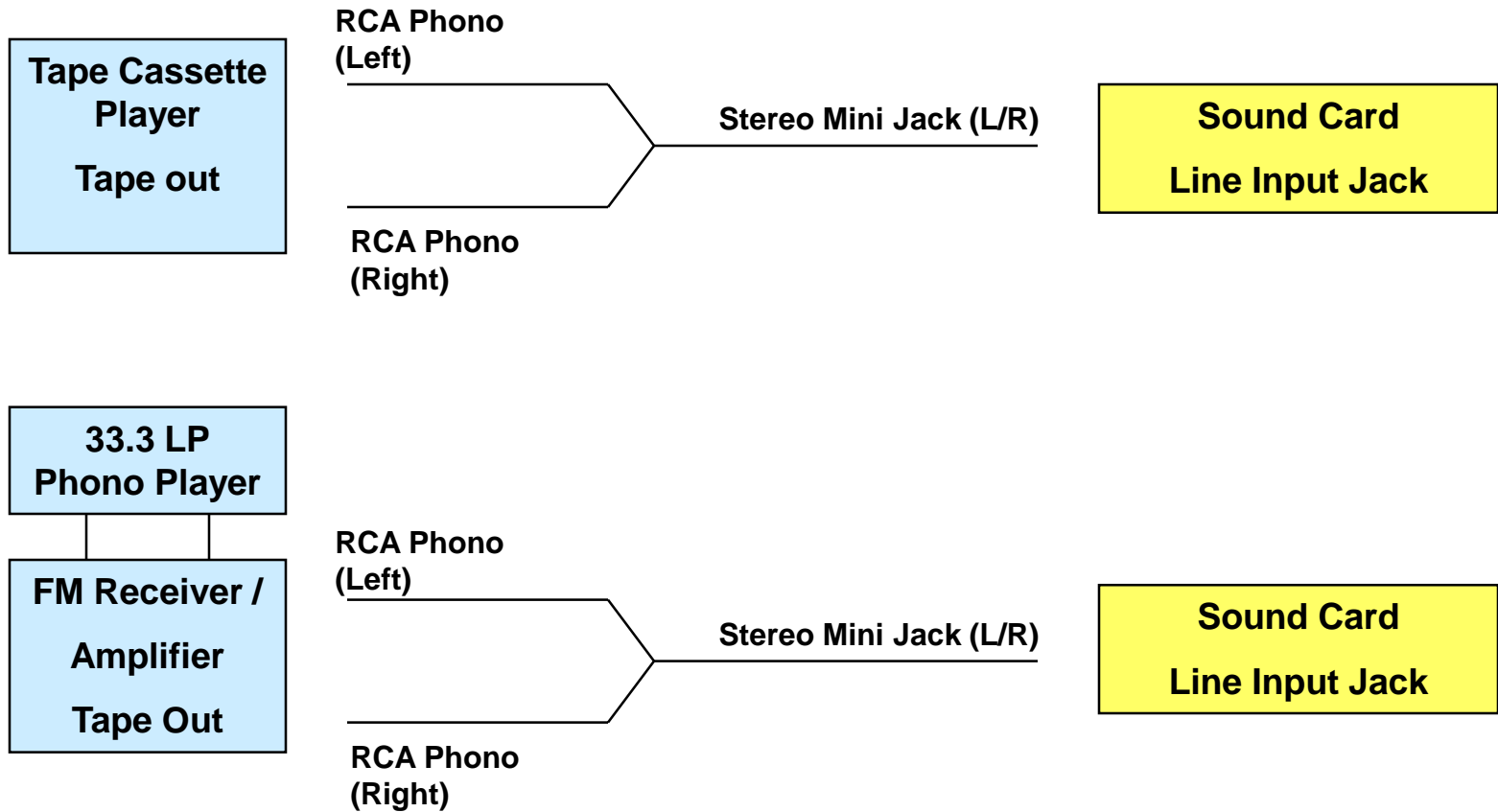
CD Rippers

- **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, WinAmp, Roxio or Nero 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

Tape Cassette Player **Tape out**	

RCA Phono (Left)

Stereo Mini Jack (L/R)

RCA Phono (Right)

Sound Card

Line Input Jack

33.3 LP Phono Player	
FM Receiver / Amplifier **Tape Out**	

RCA Phono (Left)

Stereo Mini Jack (L/R)

RCA Phono (Right)

Sound Card

Line Input Jack

Digital Music Editors

- **GoldWave (Shareware)**
  - **Does line-in recording**
  - **Full-featured music editor**

- **Audacity (Open Source)**
  - **Does line-in recording**
  - **Full-featured music editor**

- **Roxio Creator Suite - Music Editor**

- **Nero Suite - Wave Editor**

What Are Jukebox Programs?

- 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 Free Juke Box Programs

- **Microsoft Windows Media Player**
- **Itunes**
- **WinAmp (oldie, but still a goodie)**
- **VideoLan VLC (audio and video player)**
- **All of the above are FREE!**

Organizing Your Music Library

- *Physical* Placement of your music files.
  - Folder and file hierarchy important.
  - Best is Artist > Album > Song name.
  - Default is your personal "My Music" or "Music" folder.
  - If have two hard drives, consider placing on the non-boot drive.

- Use a Jukebox 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 jukebox programs.

- Adjust physical file names based on tags.

Adding Files to Library / Editing Tags

- **We'll use *iTunes, but* Media Player, WinAmp 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.**

Music CD Burning Programs

- **Most Jukebox Programs (see previous).**

- **Roxio - Easy CD Creator or Easy Media Creator**
  - **Good, easy to use, handles all media types.**

- **Ahead Software – Nero (CD & DVD)**
  - **Good, easy to use , handles all media types..**

- **Ashampoo Burning Studio**
  - **Free version available**

CD Burning Tips

- **Use good quality media. Clean it before inserting!**
- **Use media rated to desired speed (e.g. 40X).**
- **Burners should have full access to the CPU and HD.**
- **Enable "Burn Proof" buffer mode if available.**
- **Shut down background programs, especially those that access the Internet. For example:**
  - **Web browsers.**
  - **E-mail client (Outlook, Windows Mail or AOL).**
  - **Stock tickers, indexers, power managers.**
  - **Screen savers.**

Demo - Burning MP3 CDs

- Can use *iTunes*, Media Player, WinAmp, Roxio or Nero.
- *Demo* – creating and burning an iTunes Play List
    - File > New Play List.
    - Drag and drop songs from the Library to the Play List (about 200).
    - Keep track of total playing time (< 650 minutes)
    - Drag songs in the play list into preferred order or turn on shuffle.
    - Edit > Preferences > Advanced (check your settings).
    - Click the "Burn Disc" item on the File menu.
    - Set the CD burning parameters for "MP3 CD".
    - iTunes will check the collection and then begin the burn.

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* – Downloading an iTunes Play List**
  - **Plug in your i-Thing to a USB port with iTunes running.**
  - **Select or create a Play List (see previous slide).**
  - **Adjust settings for the Device (see web tutorial above).**
  - **Tell iTunes to synch just the selected Play List.**

- **Can use Windows Explorer to download to an Android Hand-held.**
  - **Plug in your Android device to a USB port.**
  - **Windows will "mount" it with a drive letter.**
  - **Copy music files from your hard drive's "Music" folders to folders on your Android device.**
  - **Or copy music files to a micro-SD card and plug it in to your device.**

Streaming Media Services

- **http://www.Pandora.com**
- **http://www.amazon.com (Amazon Prime)**
- **http://us.napster.com (formerly Rhapsody)**
- **http://www.Netflix.com**
- **http://www.youtube.com**
- **http://www.hulu.com**
- **Shoutcast (Internet Radio stations)**
  - **Available via iTunes & other Jukebox programs**
- **Music channels on Cox, DirecTV & Dish**

Free Video Editing Tools

- **DVDShrink 3.2.0.15**
  - **Removes copy protection from a video DVD**
  - **http://www.softpedia.com/get/CD-DVD-Tools/CD-DVD-Rip-Other-Tools/DVD-Shrink.shtml**

- **HandBrake**
  - **Converts a region free DVD or .ISO to a .MP4**
  - **http://handbrake.fr**

- **Windows Live Movie Maker 2012**
  - **http://windows.microsoft.com/en-us/windows/get-movie-maker-download**

Where To Find Music & Videos

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

Other Useful Web Links

- **http://www.howstuffworks.com/cd.htm**
- **http://audacity.sourceforge.net/**
- **http://download.cnet.com/windows/**
- **http://www.roxio.com**
- **http://www.nero.com/eng/index.html**
- **http://www.itunes.com**
- **http://www.videolan.org**
- **https://winamp.en.softonic.com/download**
- **http://www.microsoft.com**
- **http://www.ashampoo.com**
- **http://www.acoustica.com/spinitagain/**