

Sun City Summerlin Computer Club Seminar

Digital Music *Getting Started*

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Agenda

- **1 What Is *Digital* Music**
- **1 Audio File Formats and Standards**
- **1 Building Your Music Collection**

- **2 Cleaning up and editing recorded music**
- **2 Organizing Your Music Library**

- **3 Burning Music CDs**
- **3 Making Videos and Slide Shows**
using your music and Movie Maker

- **Useful Web Links for More Information**

What Is Digital Music?

- **Music is represented as a stream of numbers.**
 - Measurements of recorded electrical voltage level at an instant (A to D).
 - Use 16 bits (2 bytes) per measurement (sample).
 - For stereo, two streams – one for each channel.
 - Standard audio CD sample rate is 44,100 per second.
 - Can convert the stream of numbers back to voltages (D to A).
- **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.
- **Look at a MP3 file with GoldWave Music Editor**

Sound Card / Chip Basics

- **Able to output analogue stereo sound from digital output stream (D to A conversion; i.e. numbers become an electronic wave form).**
- **Able to convert analogue stereo input to a digital sound stream (A to D conversion; i.e. an electronic wave form to numbers).**
- **Connects to CD / DVD drive so PC can “play” music CDs.**
- **Card has Line-in, Line / Speaker out, and Microphone jacks.**
- **<http://www.howstuffworks.com/sound-card.htm>**

Audio File Formats (1)

- **Microsoft WAVE (.WAV)**
 - 44,100 samples/sec, stereo, 16-bit samples each channel.
 - Uncompressed, consumes about 10.6 MBytes per minute of sound (44,100 * 2 * 2 * 60).
 - Audio CD Quality (same specs).
- **Motion Picture Experts Group Level 3 (.MP3)**
 - Compressed, size varies based on sample rate.
 - 128K bits/sec (CD quality), 64 Kbits/sec (FM quality).
 - At 128Kbits/sec, uses about 1 MB per minute of sound (10 to 1).
 - Little point in going higher than 192Kbits/sec for MP3.

Audio File Formats (2)

- **MP3Pro (.MP3) – Newer Standard (Never caught on)**
 - Double compressed, size varies based on sample rate.
 - 64 Kbps (CD quality), 48 Kbps (FM quality).
 - At 64Kbps, uses about .5 MB / minute of sound.
- **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*).
- **Other Formats:**
 - Apple (.AAC), Ogg-Vorbis (.ogg), Free-Lossless (.FLAC)
- **More Information**
 - <http://ekei.com/audio>

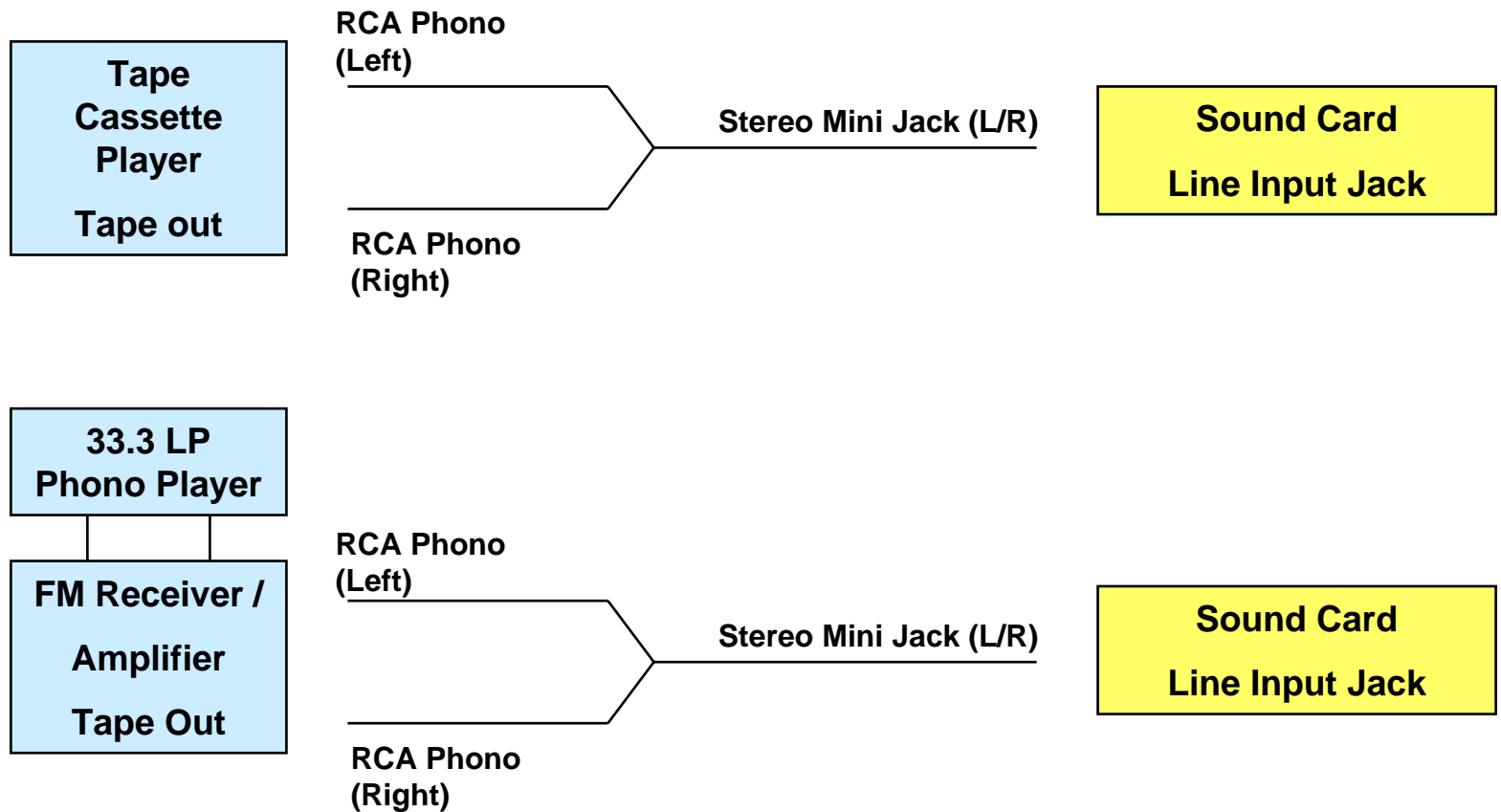
Building Your Music Library

- **Convert *your* music CD collection to music files.**
 - Use any of the popular “rippers”.
- **Buy “used” CDs (save about 50%) to rip.**
- **Borrow music CDs to rip?**
 - Friends, public library.
- **Buy digital music on-line.**
 - \$.99 per song, \$9.99 per “album” sometimes less)
 - Most stores now sell “unlocked” MP3 files.
- **Record Internet streaming audio**
 - Use a tool like Total Recorder
- **Convert your old 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 Internet CD Database (CDDB).
 - Legal, fair *personal* use of copyrighted material you own.
- **Many CD rippers available (shareware, freeware, jukeboxes).**
 - <http://www.freerip.com>
 - Easy – Place CD in your CD drive and “rip away”.
 - Ripped files can go in any folder – usually “My Music”.

Converting Audio Tapes and LPs



Line-In Preliminary Steps (1)

- Hook up equipment as per preceding diagram.
- **Make sure Line-in is coming from RCA jacks (316 milli-volt), not *speaker* jacks.**
- Power on all the stereo equipment.
- Use Windows Volume Control to set levels and mute the Mic input.
- Clean the LP, tape heads, stylus, ...

Line-in Preliminary Steps (2)

- **“Play” the tape / LP to be recorded into the line-in jack.**
 - **PC speakers will output the sound.**
 - **Tests reception and volume levels.**
- **Rewind or re-queue the audio to be recorded.**
- **Launch Line-in recording software**
 - **GoldWave, MusicMatch, Audacity, ...**
- **Adjust program settings as needed to record from Line-In.**
 - **(Set MP3 bit rate to 128 or 160 – no point in going higher)**

Line-In Recording (1)

- **Best Approach:**
 - Record entire LP or tape as two large single MP3 files (easiest).
 - Side 1 is one large MP3; Side 2 is a second large MP3.
- **Activate the recording window in GoldWave or Spin It Again.**
- **Set the artist name, album name and track title (e.g. “Side 1”).**
- **Start Recording in the software.**
- **Start playing the LP, tape or single song you want to record.**

Line-In Recording (2)

- **Allow the album or tape side to play to completion.**
- **Stop the LP or tape on the player.**
- **Stop the recording software.**
- **Save the recorded file if necessary.**
- **Set up and proceed as above to record the second side using track title “Side 2”.**
- **Set up for recording the next LP, tape or single song.**

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**

Post-Processing a Full Album

- Use GoldWave, Nero Wave Editor, Roxio, Audacity
- Clean up each “side x” file with noise and hiss filters, mute and crop off start / end noise.
- Optional - can break each side up into individual files:
 - Open the “full album” MP3 file for Side 1 or Side 2.
 - View the entire wave form.
 - Zoom in as needed.
 - Identify start / end of each song (short interval of 0 level between).
 - Highlight the song from start to end (include some silence at each end).
 - Save the highlighted segment as a separate MP3 file.

Organizing Your Music Library

- **Physical Placement of 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 second.
- **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.**
- **Use a Jukebox program to index your files into a Library.**

Jukebox Programs

- **Most support a Music Library to organize your music.**
- **Most support ripping from Audio CDs.**
- **A few support stereo recording off the sound card “line” input.**
- **All can play CDs and music files back through your sound card.**
- **Can usually convert between some file formats.**
- **Can often burn new music CDs with your favorite tracks.**
- **Most now support on-line music radio streams.**
- **Most now support on-line music stores for downloads.**

Popular Juke Box Programs

- **Microsoft Windows Media Player 10, 11 or 12**
- **iTunes V10**
- **VideoLan VLC (audio and video)**
- **WinAmp 5**
- **Rhapsody Real Player (*not recommended*)**

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**

CD Burning Tips

- **Use good quality media.**
- **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:**
 - **MS Internet Explorer, MS Personal Web Server.**
 - **E-mail client (Outlook, Outlook Express or AOL).**
 - **Stock tickers, indexers, power managers.**
 - **Screen savers.**

Demo - Burning Audio 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 23).
 - Keep track of total playing time (< 70 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 “Audio CD”.
 - iTunes will check the collection and then begin the burn.

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.

Making Video Slide Shows

- **Start Windows Movie Maker**
- **Choose “New Video”**
- **Select photos to be included in the slide show**
- **Drag and Drop them into the time line.**
- **Specify slide transitions, durations**
- **Choose background music (optional)**
- **Drag and Drop it into the time line.**
- **Preview your video slideshow**
- **Publish (burn) your slide show video to:**
 - **DVD**
 - **Video CD**

Useful Web Links

- <http://www.howstuffworks.com/cd.htm>
- <http://audacity.sourceforge.net/>
- <http://www.download.com/>
- <http://www.roxio.com>
- <http://www.nero.com/eng/index.html>
- <http://www.itunes.com>
- <http://www.videolan.org>
- <http://www.winamp.com>
- <http://www.microsoft.com>
- <http://www.ashampoo.com>
- <http://www.rhapsody.com>
- <http://www.audio4fun.com/>

Where To Find Music

- <http://www.napster.com/>
- <http://www.emusic.com/>
- <http://www.amazon.com>
- <http://www.walmart.com>
- <http://www.itunes.com>
- <http://www.midikaraoke.com/>
- <http://www.half.com/products/music/index.cfm>
- <http://www.secondspin.com>