

Sun City Summerlin Computer Club Seminar

Digital Media *Getting Started*

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Agenda

- **What Is *Digital* Music**
- **Audio File Formats and Standards**
- **Building Your Music Collection**
- **Cleaning up and editing recorded music**
- **Organizing Your Music Library**
- **Burning music CDs**
- **Useful Web Links for More Information**
- **Recording Video Tapes**

What Is Digital Music?

- **Music is represented as a stream of numbers.**
 - Measurements of electrical voltage level at an instant.
 - Can convert the stream of numbers back to voltages.
 - 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.
- **Number stream may be saved in various ways**
 - On an audio CD.
 - In a music file on a PC hard disk.
 - Music files may be compressed in various ways or left uncompressed.
- **Look at a MP3 file with GoldWave**

Sound Card / Chip Basics

- **Able to output analogue stereo sound from digital output stream (D to A conversion; i.e. numbers converted to an electronic wave form).**
- **Able to convert analogue stereo input to a digital sound stream (A to D conversion; i.e. convert an electronic wave form to numbers).**
- **Connects to CD / DVD drive so the PC can “play” music CDs.**
- **Card has Line-in, 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 MB per minute of sound (44,100 * 2 * 2 * 60).
 - CD Quality (same specs).
- **Motion Picture Experts Group Level 3 (.MP3)**
 - Compressed, size varies based on sample rate.
 - 128K bits/sec (“Near CD” quality), 64 Kbps (“FM” quality).
 - At 128Kbps, uses about 1 MB per minute of sound.
 - Little point in going higher than 192 Kbps for MP3.

Audio File Formats (2)

- **MP3Pro (.MP3) – Newer Standard**
 - 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.
(But check out *our* experimental results).
- **More Information**
 - <http://ekei.com/audio>

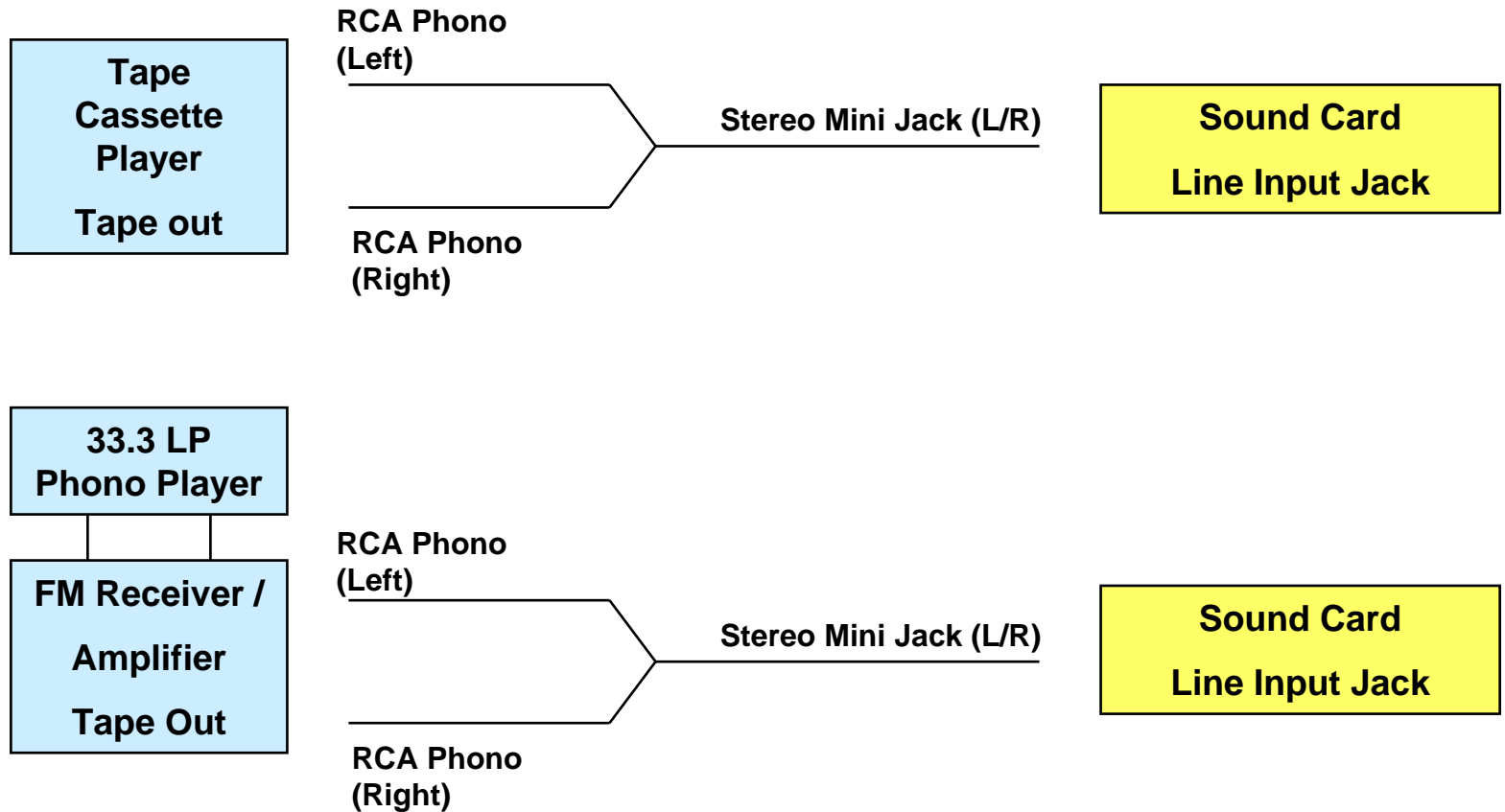
Building Your Music Library

- **Convert *your own* 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”.**
 - **Most stores now sell unprotected MP3 files (256KB sampling)**
- **Record Internet streaming audio**
 - **Use a tool like Total Recorder**
- **Convert your audio tapes and LPs to music files.**
 - **Need a “line-in” recording tool (e.g. Spin It Again).**
 - **After recording, need to separate and “clean-up” the recorded sound.**

Audio CD Rippers

- **Ripping (Definition)**
 - Copying contents of an Audio CD to your hard disk.
 - Digital audio data is converted to: .WAV, .WMA or .MP3.
 - Often audio album and track information looked up in online CD Database (CDDB).
 - Legal, fair *personal* use of copyrighted material you own.
- **Many CD rippers available (shareware, freeware, jukeboxes).**
 - <http://www.mgshareware.com/frmmain.html>
- **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 or Spin It Again's Volume level check to set recording levels.
- 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**
 - **Spin It Again, GoldWave, Audacity, Nero, ...**
- **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 single MP3 files (easiest).
 - Side 1 is one large MP3; Side 2 is second large MP3.
- **Activate the recording window in Spin It Again or GoldWave.**
- **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 file to the E:\Music_Temp folder (if on the Media PC).**
- **Set up 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 Wave Editor**
- **Spin It Again (can do noise reduction)**

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.
 - iTunes does this very well.
- **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.**
- **Some 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**
- **iTunes V9**
- **WinAmp 5**
- **VLC Player**

- **Yahoo Music Jukebox (*not recommended*)**
- **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**
- **Music Morpher Gold (Free)**

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
 - Keep track of total playing time (< 70 minutes)
 - Drag songs in the playlist into preferred order or turn on shuffle.
 - Edit > Preferences > Advanced
Set the CD burning parameters for “Audio CD”.
 - Click the “Burn Disc” button at the bottom right.
 - iTunes will check the collection and then begin the burn.

Recording Video Tapes

- **Can use Pinnacle Direct to DVD or Pinnacle Studio 12.**
- **Example Steps:**
 - Turn on the VHS player.
 - Place your VHS tape into the VHS player.
 - Rewind the tape.
 - Start Pinnacle Direct to DVD (icon is on the desktop).
 - Insert a blank DVD disk into the PC's DVD recorder tray.
 - Press the play button on the VHS tape deck
 - Click the record button in Direct to DVD.
 - Be patient – recording is in real time.
 - Limit – 104 minutes of recording.

Useful Web Links

- <http://www.howstuffworks.com/cd.htm>
- <http://www.smartcomputing.com> (subscribers)
- <http://audacity.sourceforge.net/>
- <http://www.download.com/>
- <http://www.roxio.com>
- <http://www.nero.com/en/index2.htm>
- <http://www.musicmatch.com>
- <http://www.winamp.com>
- <http://www.microsoft.com>
- <http://www.ashampoo.com>
- <http://www.audio4fun.com/>

Where To Find Music

- <http://www.mp3.com/>
- <http://www.emusic.com/>
- <http://www.midikaraoke.com/>
- <http://www.half.com/products/music/index.cfm>
- <http://www.jumpmusic.com/>
- <http://music.download.com/>
- <http://www.secondspin.com>
- **On-line Music stores:**
 - Amazon store
 - iTunes store
 - Walmart store