

HOW TECHNOLOGY HAS CHANGED THE WAY WE LISTEN TO MUSIC

- Presented by Ray Baxter
 - Acting President & Treasurer, APCUG
 - Payson Computer Meet-Up Club, Payson, AZ



Background Info

Music Related

- ▶ Born and raised in New York City; as a youngster at the birth of R&R I started my record buying at the age of 11.
- ▶ The first President of the Doo-Wop Society of Southern California which for 14 years starting in 1989 produced live quarterly stage shows primarily featuring the vocal groups of the 1950s and early 1960s
- ▶ Member of RCA (Record Collectors of Arizona), a Phoenix, AZ based club that meets bi-weekly to play 45 rpm records and CDs while discussing the early days of Rock & Roll (now meet via Zoom)
- ▶ Co-founder of local music listening club that meets monthly where we play all types of popular music from the last 70 years as well as watch YouTube music related videos (now meet via Zoom)

Technology Related

- ▶ Acting President & Treasurer Association Personal Computer User Groups
- ▶ President of the Payson Meet-Up Computer Club in Payson, AZ
- ▶ Adjunct Instructor at the Payson campus of Eastern Arizona College teaching three computer related courses (not this semester)

“ MUSIC IS FOREVER; MUSIC SHOULD GROW AND MATURE WITH YOU, FOLLOWING YOU RIGHT ON UP UNTIL YOU DIE ”

Above quote is from Paul Simon. Most likely a true statement for the majority, but for me rarely a day goes by that at some point I'm not listening to the music of my youth.

Trivia question: Before they were Simon & Garfunkel, do you know the name this duo used in 1957?

Tom & Jerry “Hey School Girl”

Reached #49 on Pop charts in late 1957. Garfunkel (Tom) and Simon (Jerry) had known each other since their Queens, New York elementary school days.

While there were follow-up song releases, none generated any interest, and the teenage boys went back to focusing on what they must have thought would be their non-music future.



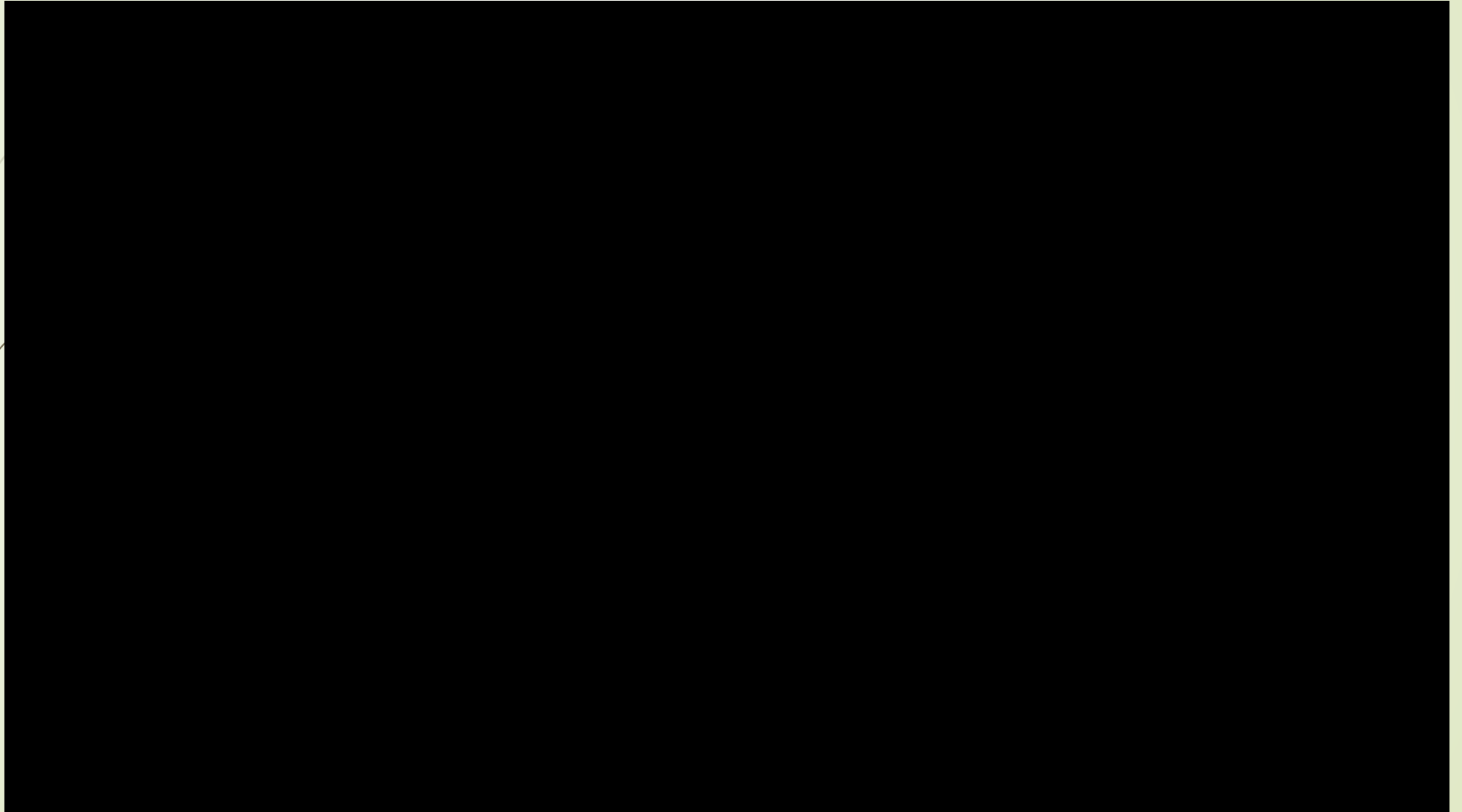
Now, on with the show!

➤ A Two-Part Presentation

- 1.** *A review of our music listening habits and devices used during the last 70 years - from the 78 rpm Victrola to the Compact Disc. We'll see how many of these you remember and which ones you may have owned at one time, or even still have tucked away in a closet or attic.*
- 2.** *A look at today's download and streaming offerings. Music clouds, owning vs. renting music, and all the choices that are available to listen to your favorite tunes.*



A Brief Introduction to Ray's "Man Cave"



Before 1948

- ▶ The phonograph, invented in 1877 by Thomas Edison, led to the development of the 78-rpm record where during the first half of the 20th century allowed consumers to choose what music they wanted to listen to at home.



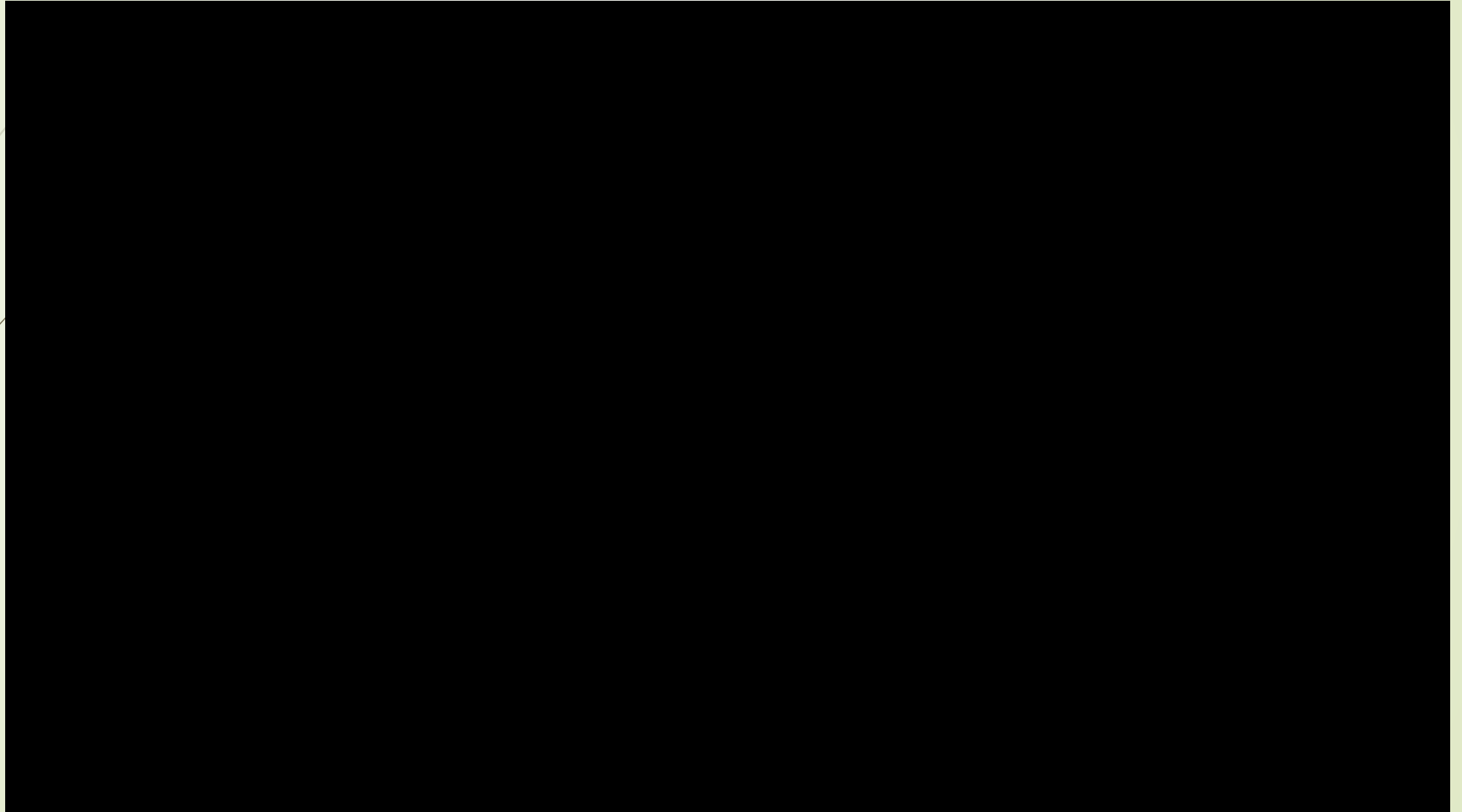
78 RPM - A Format With A Need For Improvement

- 78 RPM records were made of shellac and could easily chip or shatter.
- Due to the weight of the tone arms on early players, the recording grooves (and thus the sound quality) would deteriorate after many plays.
- Some consumers would add to this problem by taping a coin to the tone arm to help reduce skipping. **Sound familiar?**





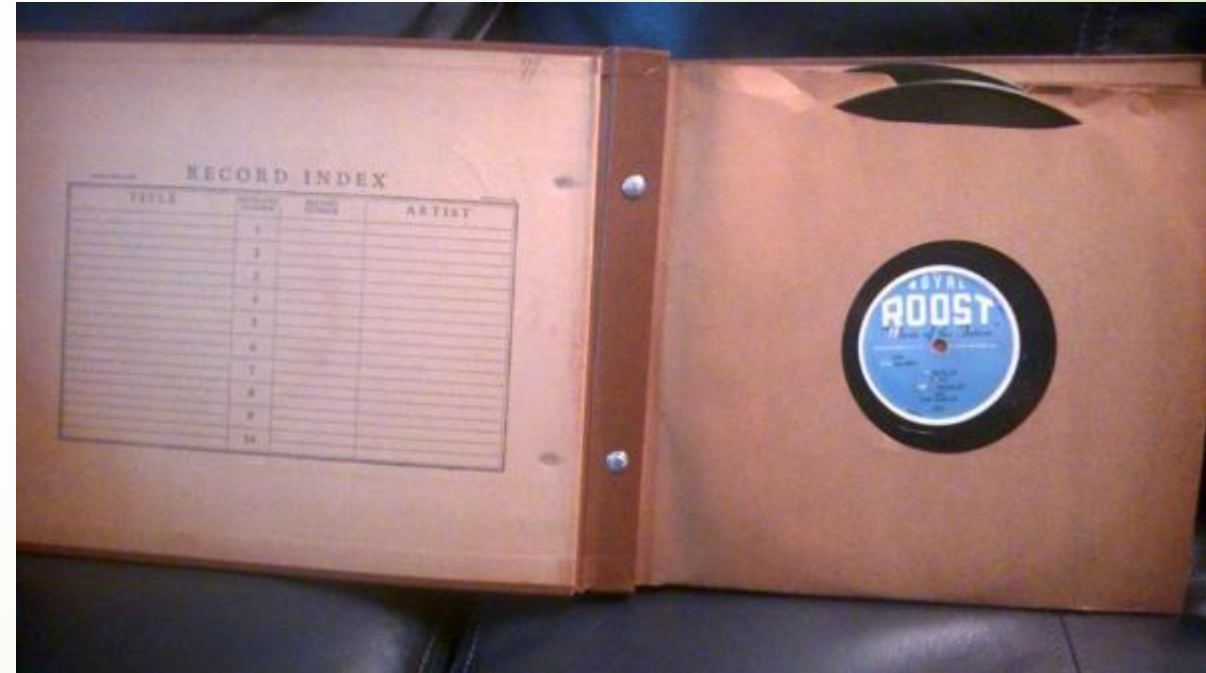
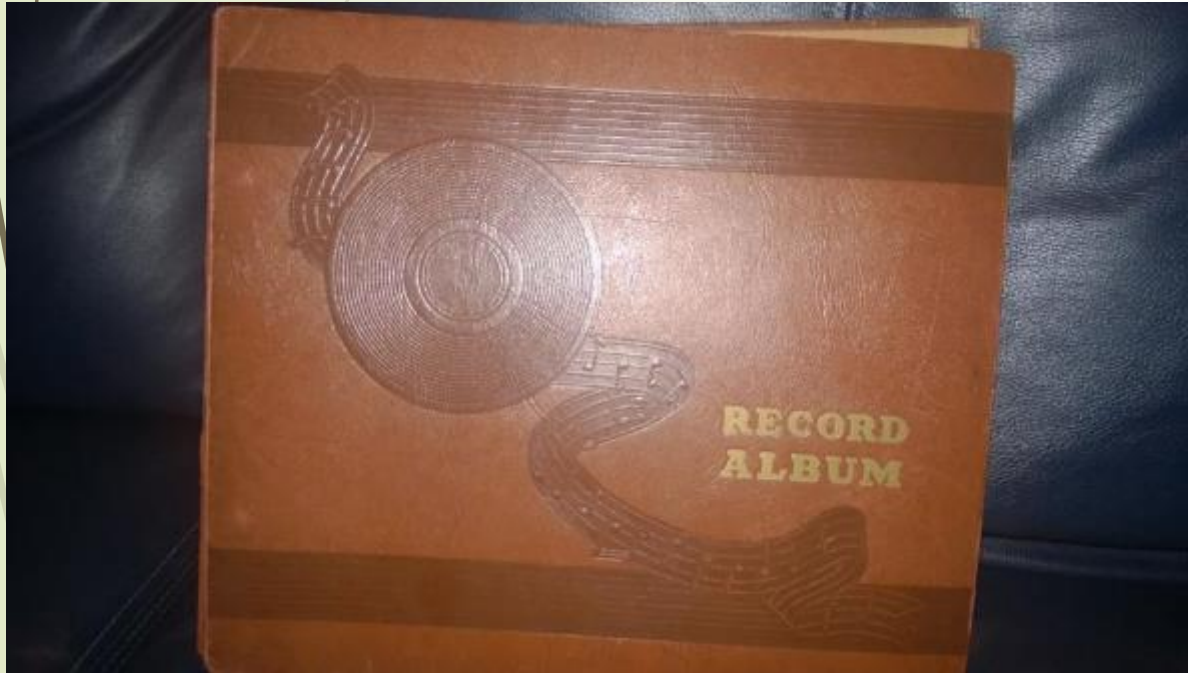
How Does a 78 RPM Record Sound?



Why Are LP Records Called Albums?

- Early on classical releases laid the groundwork for the origin of the term “**album**” because each side of a 78 could only hold about five minutes of music. Hour-long symphonies had to be divided into multiple discs, which were bound together in something resembling a photo album.
- The usage of the word “album” with respect to music sound recordings continues into the 21st century as another name for a musical CD, or even a full “album” download.

78 RPM Record Album That Can Hold Up to Ten Records



Let's Not Forget About the Radio

- ▶ Record players were expensive and there were many people who could not afford them.
- ▶ But before 1948 most households had a radio, and after the initial cost, the music was free.





Radio Made Available All Types of Music for All Kinds of Listeners

Before the 1960s in a segregated America phonograph records broadcast over the radio were available for all to hear; it only depended where on the tuning dial the listener chose to stop.

In a small way radio helped equalize the social classes

- Both the poor and the rich could hear the great vocalists
- White listeners could listen to black music without fear of violating any of the current day social norms.
- In the mid-1950s, particularly in large urban cities, there were many a young white teenager with a transistor radio tucked under the pillow in the wee hours listening to the transition of Black R&B into early Rock 'n' Roll.
 - **(Just ask me.)**

Records Become Vinyl: A Format War Begins

LP (Long Playing) Album

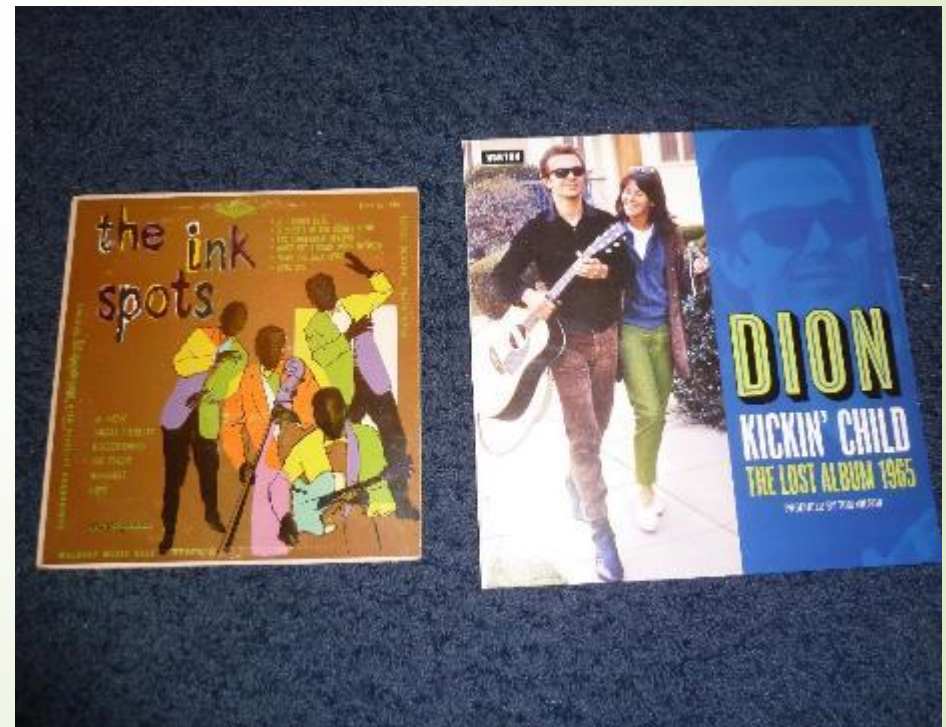
- Developed and introduced by the Columbia Broadcasting System in 1948 to improve upon the decades old 78 RPM format.
- At the time Columbia's archrival RCA Victor was the largest record label for distributing 78 rpm records.

Benefits of the LP over the 78

- Greater sound fidelity
- Weighed less
- Far less breakable
- By playing at a slower speed (33.3 RPM) a 12 inch disc could have as much as 22 minutes of music per side.

First LP Records were 10 inches in diameter

- The first Long Play records were 10 inches in diameter, the same as the 78-rpm record.
- My guess is Columbia thought it best to keep the same size disc that the general public was already used to.
- Within a few years the LP size was increased to 12 inches (to accommodate more tracks on each side) where it has remained to this day, although over the years various other size discs were tried but failed to catch on.





The Little Disc With The Big Hole In The Middle

The 45 RPM Record

- RCA Victor needed to compete from a sound quality perspective with the LP and so introduced in 1949 its new format.
- RCA Victor had an advantage in that they also made the record players and could sell them at cost to entice new buyers.

Benefits: 45 over the LP

- With about 3 minutes of playing time on each side, this was the perfect length for the “pop” as well as “hillbilly” songs of the day.
- This size disc was also ideal to replace 78s in the nation’s jukeboxes, which at the time were extremely popular.

How Many Of You Still Have Your 45's?



45 RPM "EP" - Extended Play

Two Songs on Each Side

Today when a new artist does not have enough songs for a full album, they release typically 4 to 6 songs as a download and call it an EP, but this term has been around for many years

Early R&R helped make the EP 45 RPM popular by offering two songs to each side of the record

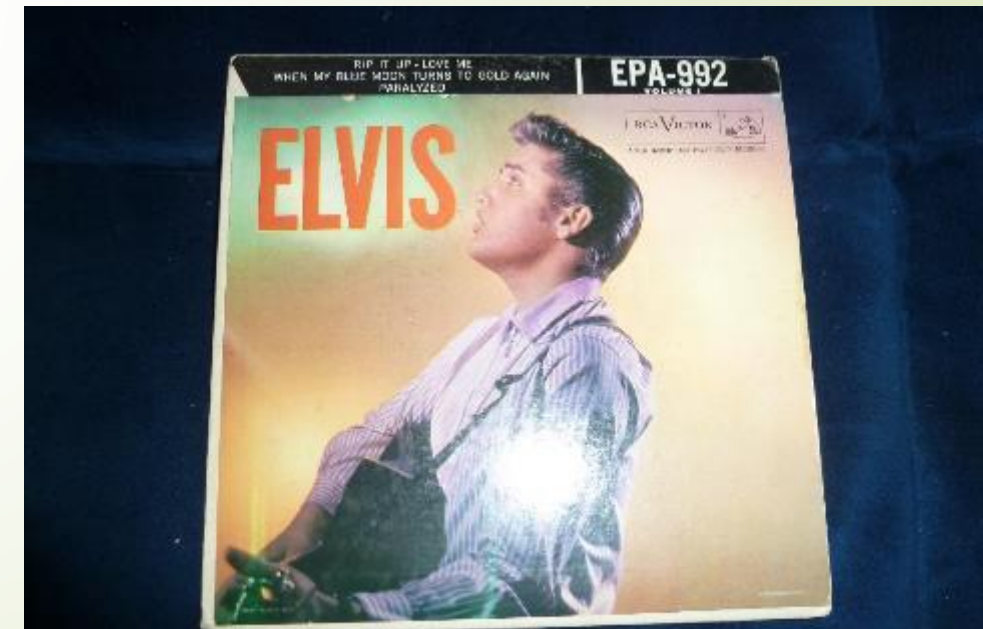
Typically came with a cardboard picture sleeve like their "big brother" LP (Long Play) album

These EP record sleeves from the 1950s are worth much more today than the actual record

Elvis Presley continues to be one of the most collectible recording artists of all time

Elvis comes in second place for the top selling solo-artist of all time in any genre in U.S. history, the first is Garth Brooks

Both Elvis and Garth are behind the Beatles, who are the top selling of all artists all time



How Many Can Relate To This?



WHEN I WAS A KID

**THIS IS
HOW WE MADE A
PLAY LIST**

8-Track Tape Arrives: Have Music Will Travel

Unintended Results

- Invented by Bill Lear in 1965 (for his line of private jets) the units were ideal for consumers to play music in their cars.
- The players were initially manufactured by a Ford Motor Co. affiliate, thus making the name “**Motor Victrola**” into **Motorola Corporation**.

Music On The Go With The Continuous Endless Loop



The Compact Cassette

Humble Beginnings

- Developed in 1963 but initially only used for dictation recording due to poor sound quality.
- Early 70s introduction of Dolby B tape noise reduction system and the ability to record “hi-fi” made the Compact Cassette a serious format for recording music.



Staying Power

- Home recording decks allowed consumers the ability to create their own “mix tapes.”
- Continuing improvements in tape quality, and other features kept the Compact Cassette a popular format into the 21st century.

The Sony Walkman

- The Sony Walkman in 1979 ushered in a new era of portability selling over 200 million units.
- Compact size made them conducive for “music to jog by” and other outdoor activities.
- Sony’s lead helped the cassette tape outsell vinyl records for the first time in 1983.
- The popularity of the Walkman was at its highest during the period 1987-97.
- With the introduction of the Compact Disc the cassette format began to fade.
- The “Walkman” name stayed relevant for many years as an MP3 player, a phone and a portable DVD player.

Music Portability Before the iPod was

- The Sony Walkman



What to do with my old “mixtape” cassettes?

If your old cassette tapes just have the music of the day, your best choice is to replace them by buying a new format.

But if you have “one of a kind” tapes that you want to digitize here is a solution.

Upper photos are what appear to be a standard cassette player with typical controls of Play, FF, Stop, etc.

Bottom left photo shows this player has a connection for a USB flash drive that will record as an MP3 file when the cassette tape is being played.

Bottom right photo shows a similar but larger “boom box style” device that can also accommodate a USB flash drive as well as an SD card.



Timelines For The Compact Disc

From The Beginning

- In mid 1970s both Sony and Phillips were involved in the research and development of optical disc technology
- As I recall the first commercial CD's were expensive and consisted of mostly classical music
- First pop album on CD in 1982 was Billy Joel's 52nd Street
- Less than a year later players and discs were released for sale on mass levels

To Almost The End

- In 1985 Dire Straits became the first artist to sell a million CDs.
- Phillips and Sony create CD-R (recordable CD) in 1990.
- In 2008 sales for large label CDs drop 20% due to the rising popularity of music downloads.
- While still a popular format, CD sales have continued to decline each year since.
- Many new cars no longer offer a Compact Disc player

Do you copy your CDs to your computer?

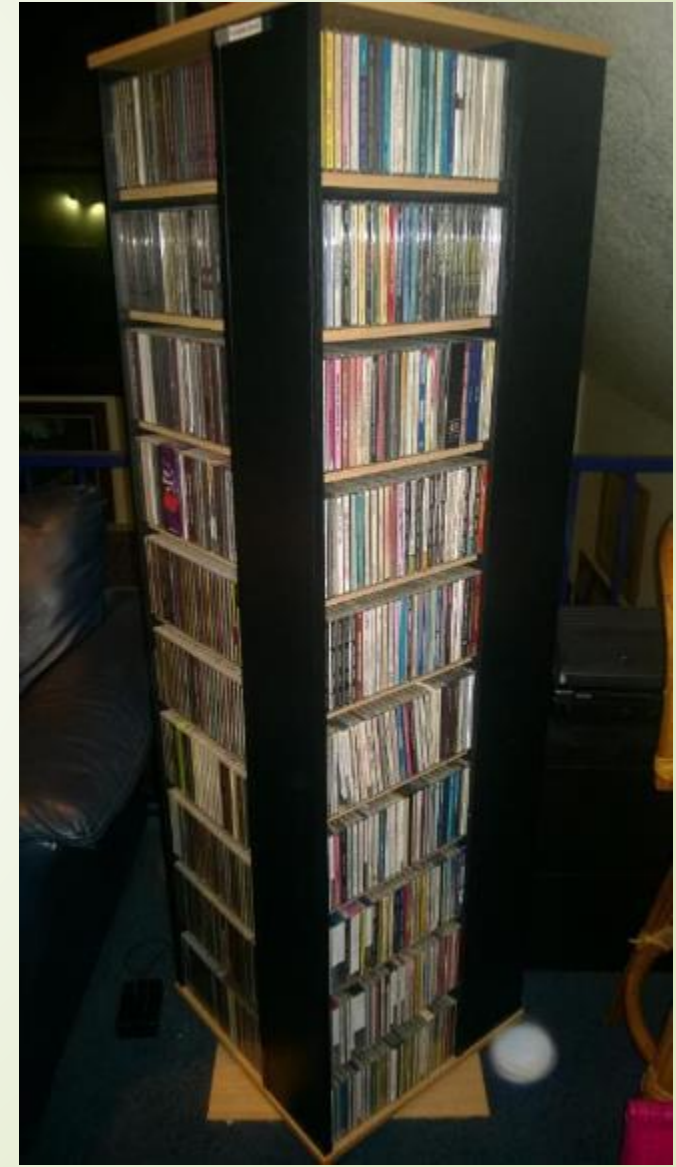
➔ The main reason for “ripping” a CD to your computer is to “**back up**” your music collection so you can:


- ➔ Make a CD copy to use in the car while keeping the original safe at home
- ➔ Organize your collection so a song can be found quickly by title, artist, or album name
- ➔ Download your music to your Smartphone
 - ➔ Many newer autos allow you to play your smartphone through the car sound system via Bluetooth or using a wired audio connection
- ➔ Copy MP3 music files to a flash drive to play in your car
 - ➔ Many newer cars have a USB connector that is voice operated allowing the user to choose music by artist name, or song title, or album title

How Does A Computer Know What Songs Are on a Music CD?

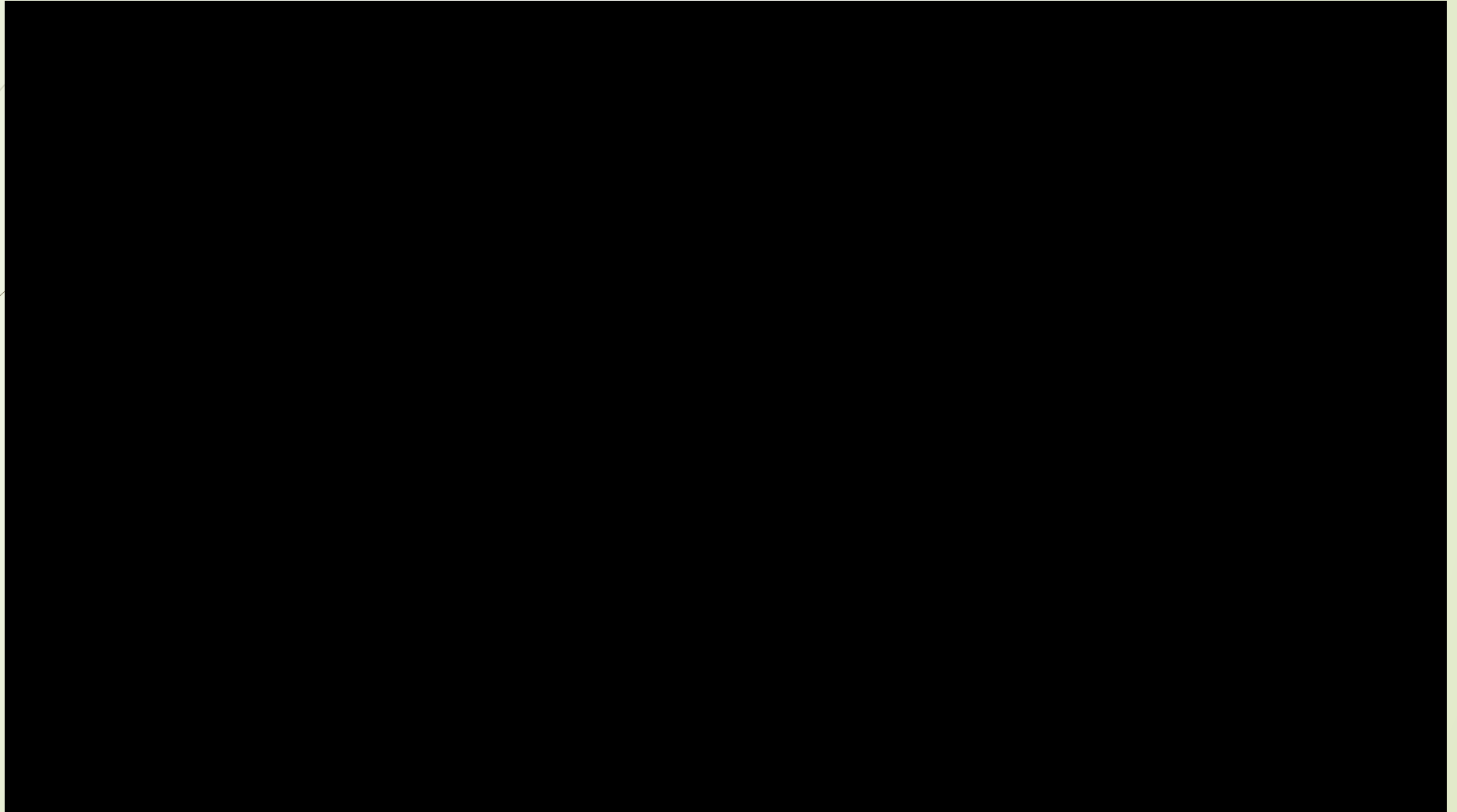
- Music CDs were first introduced to the public before the PC became standard in the home so for many of the older CDs in circulation the data for the song title and artist are not stored on the actual disc.
- When you insert a CD in a computer the metadata is automatically retrieved within seconds from an online database by comparing the number of tracks and their individual times
 - The chances of two different CDs having the same number of tracks and each track being the same length of time are remote.
 - There are several online music databases with Gracenote being the most popular
- More recent music CDs have the artist and track information encoded into the CD so this data can be read by CD players used in cars and the home, but computers cannot read this CD Text

Guess How Long It Took to Rip These?





CD trays have an inner indentation to accommodate a 3-inch Compact Disc?



The iPod Leads The Way To The Popularity of Portable Music Players

- The iPod line leads to a portable music player explosion.
 - First released by Apple Inc. in October 2001, the line continues today. **It's an iPhone without the phone.**
 - Apple's iTunes (and other similar software) provided the ability to transfer songs , photos, videos, and other data to this and other portable devices.
 - The advent of compressing music files allowed consumers to create large music libraries without using up enormous amounts of precious storage capacity.

MP3 Audio: Making Your Entire Music Collection Portable

What is an MP3?

MP3 is an audio compression subset of the **M**oving **P**ictures Expert Group family of standards.

- MP3 is a process to compress to roughly 10% the size of the original audio recording file without noticeable loss of sound quality.
- Many audiophiles disregard the MP3 and instead opt for “lossless” recordings with full fidelity.

The impact of the MP3

- Portable MP3 players which can hold thousands of songs were popular until the advent of this feature in smartphones.
- Data music discs created at home with hundreds of MP3 song files can be played on most recent car CD players
- Many modern car stereos have a USB connector allowing flash drives containing thousands of songs to be played.

Digital Downloads

Replacing CD's

- According to both Nielsen and Billboard, digital music purchases for the first time in 2011 accounted for more than 50% of music sales.
- For several years digital sales increased each year while physical CD album sales continued to decline.
- iTunes store, Amazon, and others replaced music purchases from physical stores .

Benefits

- Digital downloads are more economical as you pay for only the songs you want.
- Typically you can listen to a 30 second clip of a song before deciding if you want to make a purchase.
- New Artists can showcase their work without the need for a full album.
- Providers such as Amazon allow the purchase of a CD with immediate availability of the songs in your account as MP3 files.

Is Your Music In The Clouds?

Advantages

- Millions of songs for you to choose from
- Some allow you to upload your music collection within a limit
- Some services will match with a higher quality version of your music
- Your music is available to you on a number (typically 5) of home and portable devices

Disadvantages

- Process to move your music to the cloud can be labor intensive depending on your upload speed and the size of your music collection
- Typically need an internet connection to listen to your music

Recap of Online Music Services

Online Streaming Services

- ▶ Two levels of services:
 - ▶ **Free** where you choose genre or the artist you like, and the service chooses what songs to play with limitations on how many can be skipped each hour.
 - ▶ **Subscription** where for about \$10 per month you choose the genre or artist, and then create specific song playlists to hear on multiple (but a limited number of) devices.

Online Music Stores

- ▶ Offers the ability to purchase and download music to save on your computers and devices.
 - ▶ Individual song prices can range from 99 cents to \$1.99.
 - ▶ Not all stores offer highest quality downloads, and none offer all the music ever recorded

The Best Music Streaming Services

Most music streaming services offer a free (with ads) version and a paid version

- **Amazon Prime Music** is best for Amazon Prime members as this is a benefit of Prime membership with a 2 million song catalog; Amazon also offers the fee-based Amazon Music Unlimited which boasts a 50 million song catalog
- **Apple Music** is best for those committed to the Apple ecosystem. iTunes has been retired and replaced by the new Apple Music along with sister apps for TV and Podcasts
- Google Play Music is being retired in 2020 and replaced by the new **YouTube Music** which is geared to those who also enjoy watching music videos

The Best Music Streaming Services (continued)

- ▶ **Spotify** is headquartered in Sweden and is the largest music streaming service in the world. In addition to individual plans, they offer \$15 per month for a family of up to 6 users
- ▶ **Pandora's** free service is like the others, where you input a favorite artist and you'll hear songs by that specific artist as well as "similar" artists
- ▶ **Tidal** offers a high-end audio version for \$20 monthly to its 60 million song catalog as well as 240,000 videos. This service is noted for its focus on Hip-Hop and R&B
- ▶ Check out CNET article "**Best music streaming services for 2020**" for an in-depth review of all these music streaming services

Pros and Cons of Music Streaming Services

Advantages

1. Listen to who else recorded a favorite song
2. Listen to other songs a favorite artist recorded
3. Introduces new artists that otherwise you might never hear
4. Access to millions of recorded music songs

Disadvantages

1. Free services have limitations on the music you can hear
2. Typically need an internet connection
 1. new feature allows download of music to the app for limited time offline listening, but file cannot be copied to device
3. When not using Wi-Fi your monthly data allotment is being used

Millennials Love Music Streaming

- Younger music lovers have moved away from purchasing and collecting music media (CD and digital downloads)
- They are instead “renting” their music from these on-line services which provide a form of personalized internet radio
- By creating their own specialized “playlists” they can sort their music by genre, tempo, artist, etc. and have so much more available to listen to
- Major benefits include no need to worry about storage issues, damaging a disc, theft, etc.

How Do Singers, Composers and Others Get Paid From Streaming

- The Music Streaming Service (Spotify, Apple, Pandora, etc.) receives income from two main sources
 - Free Account - Advertisers pay the streaming service to interrupt the music you are listening to with ads.
 - Subscription Account – Users pay the streaming service a monthly fee so they can choose the music they want to hear without interruption
- What the Music Streaming Service pays the artists (and others entitled to “royalties”) is complicated and based on a variety of factors. In general:
 - Spotify pays artists \$0.0032 per stream which equals 1 cent for every 3 plays
- The next slide shows the top charting songs on Spotify, the artists behind them, and the amount they’ve earned from streaming as of March 2020

SONG	NO. OF PLAYS	ESTIMATED EARNINGS
Justin Bieber - Yummy	261,054,656	\$835,375
Future (feat. Drake) - Life Is Good	217,012,200	\$694,439
Halsey - You Should Be Sad	124,064,975	\$397,008
Justin Bieber (feat. Quavo) - Changes	110,023,238	\$352,074
Selena Gomez - Rare	102,059,311	\$326,590
Jonas Brothers - What A Man Gotta Do	81,421,741	\$260,550
Dua Lipa - Physical	70,993,401	\$227,179
Ali Gatie - What If I Told You That I Love You	63,991,466	\$204,773
Justin Bieber (feat. Post Malone & Clever) - Forever	41,310,180	\$132,193
Blackbear - me & ur ghost	40,892,196	\$130,855
Sam Smith - To Die For	32,467,956	\$103,897
Taylor Swift - Only The Young	25,948,152	\$83,034
Lauv - Changes	22,751,282	\$72,804
Hailee Steinfeld - Wrong Direction	21,449,955	\$68,640
5 Seconds of Summer - No Shame	20,433,181	\$65,386

To Stream or Not to Stream That Is The Question

You Should Consider Streaming if:

- You don't have a large collection of music but would still like to have access to favorite artists
- You enjoy discovering new artists and their music
- You are considering "downsizing" and no longer want to store and maintain a collection of vinyl or CDs
- You listen to music every day and want to have it readily available using today's technology

You Don't Need to Stream if:

- You don't have an interest in today's new artists and/or the various pop music offerings
- Listening to music is not an important aspect of your daily life
- You have been collecting music for decades, and already own all the music you ever want to hear
 - That being the case, you should take the time to "rip" the music to your computer and then to portable storage devices that you can play anywhere

Music Apps to download to your Smartphone

- ▶ Ever hear a song playing but can't recall the name or artist? With **Soundhound** or **Shazm** these apps will give you details such as
 - ▶ Song Title, Artist name, Lyrics, and Video if available
 - ▶ Top songs from this artist, and more
- ▶ Want a music player for your Android smartphone?
 - ▶ **Musiclolet** is my music player of choice for the songs saved on the SD card in my Android smartphone; features I like best include
 - ▶ Ability to search by voice
 - ▶ Free with no ads or need for internet access
 - ▶ Easily handles large collections with many features including tag editor, equalizer, and headphone control

Smart Speakers for the Home

Amazon Echo, Google Home, and the Apple Home-Pod offer an ever-increasing array of voice activated functionality with their smart speakers

- ▶ to play a song by verbal request continues to be for many the most attractive offering
- ▶ Software updates continue to make the devices more intelligent and functional by frequently adding new skills.
- ▶ Amazon offers several styles at prices starting below \$50
 - ▶ My personal favorite is the (discontinued) Amazon Tap because it has a battery that makes it portable around the house.

YouTube Music Videos

- In the early days of R&R national TV programs like American Bandstand, and many of the weekly variety shows (e.g. Ed Sullivan) were how viewers watched their favorite music icons
- Various archives have saved these clips over the decades and have uploaded them to YouTube
 - While YouTube offers a subscription music app service, most watch the free music related videos with ads
 - Current day concert footage from professionals or just individual attendees with their smartphone cameras are often uploaded to this site
 - Be careful as the YouTube site can be habit forming. More than once I've told my wife I'll be coming to bed in a little while, and the next thing I know, I can see the sun rising

Bullet Points from CNET – Feb. 28, 2019

- Digital downloads that ruled the music industry as recently as four years ago, now make less money than CDs and vinyl.
- While physical sales fell, vinyl record sales were up 7.9%
- Streaming sales accounted for 75% of revenue last year.
- People are increasingly paying monthly fees for all-you-can-access tunes on services like Spotify or Apple Music or listening free by sitting through advertising on sites like YouTube.
- This growth of subscriptions has fueled the music industry's best sales growth in years.
- Overall last year, retail revenues from recorded music in the US grew about 12 percent, to \$9.85 billion.

Question: Can you still be considered a collector if you do not buy the music?

Yes, because

- ▶ using “playlists” you still organize your music by genre, artist, and other categories just as someone who physically owns the media.
- ▶ you take the same care, maybe more, with keeping your music organized.
- ▶ with playlists you have a “collection” of the music you care about.

No, because

- ▶ you don't own the media as you do with CDs, vinyl records, and even downloads.
- ▶ due to digital rights protections, you are not able to copy the music to a device.
- ▶ the word “collector” implies that you own something, while paying a monthly fee infers you are renting.

Are LP's Taking Us Back To The Future?

According to Rolling Stone magazine, the sale of vinyl records in 2020 will soon generate more annual income than compact discs for the first time since 1986

- ▶ Vinyl sales earned \$224.1 million over the first six months of 2019 compared to \$247.9 million for CDs
- ▶ CD sales are declining three times as fast as vinyl sales are growing
- ▶ A reality check reminds us that streaming remains the most popular way to consume music, accounting for 80% of industry revenues, and growing 26% to \$4.3 billion for the first half of 2019

Are LP's Taking Us Back To The Future?

Something Old



Something New

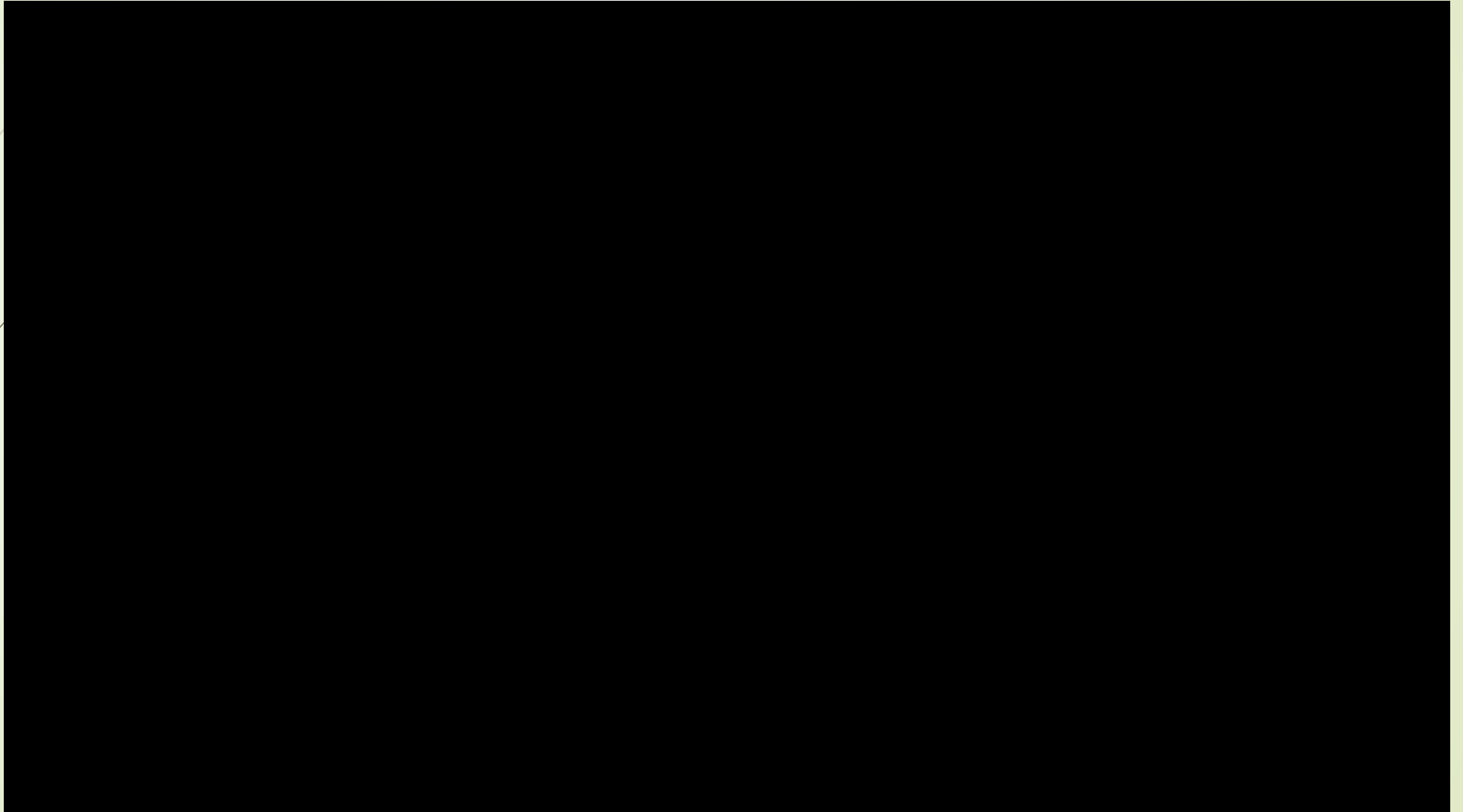


You Can Have Your Cake And Eat It Too

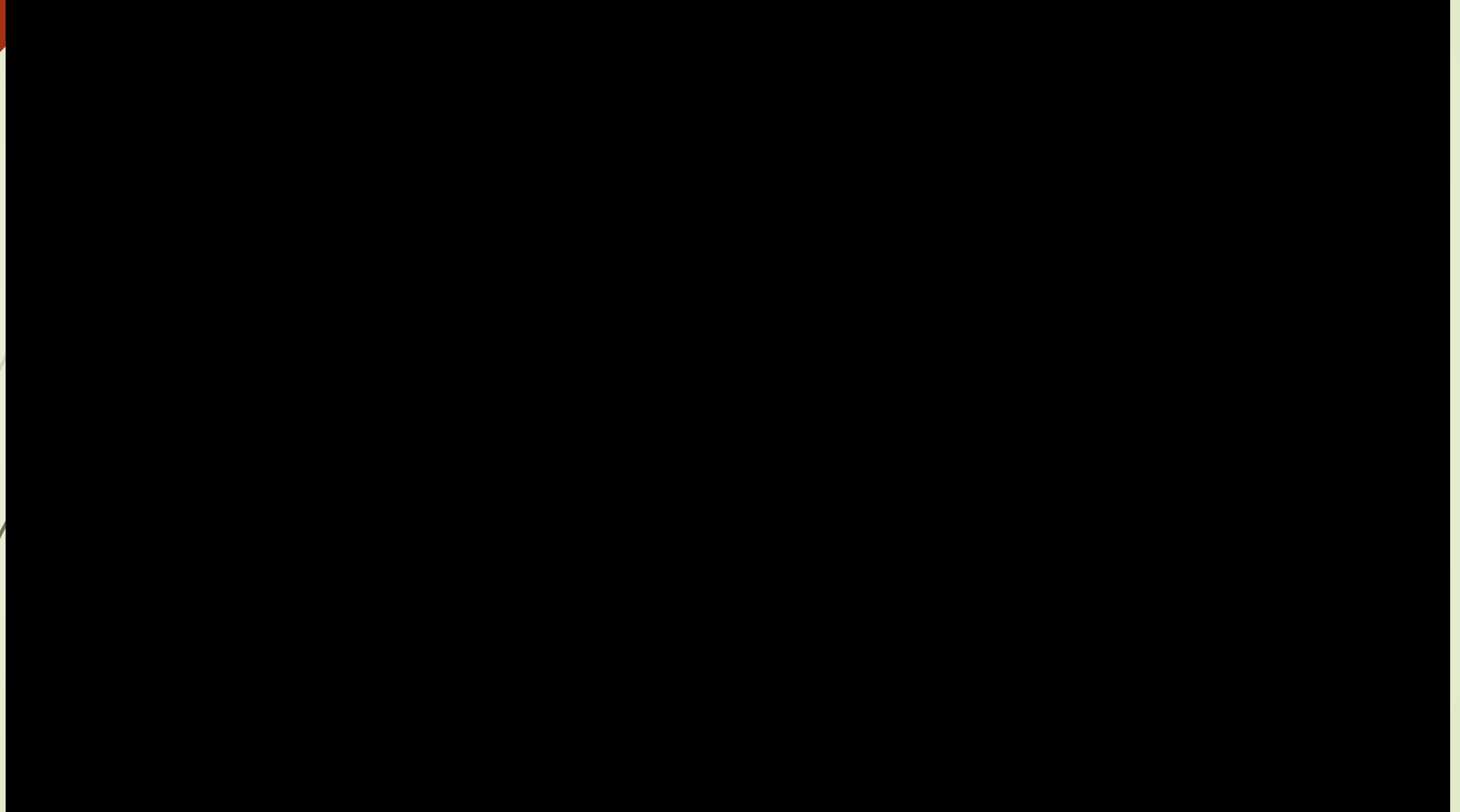
- Today's modern phonographs connect to standard RCA inputs (red and white) without the need for the higher amplification "phono" connection that was used on older receivers.
- You can purchase a turntable with a USB cable which will allow you to connect it to your computer and record the songs in real time as MP3 files.
- Some new record albums contain a one-time use code that will allow you to download for free all the songs on the album as MP3 files.



Have Music Will Travel

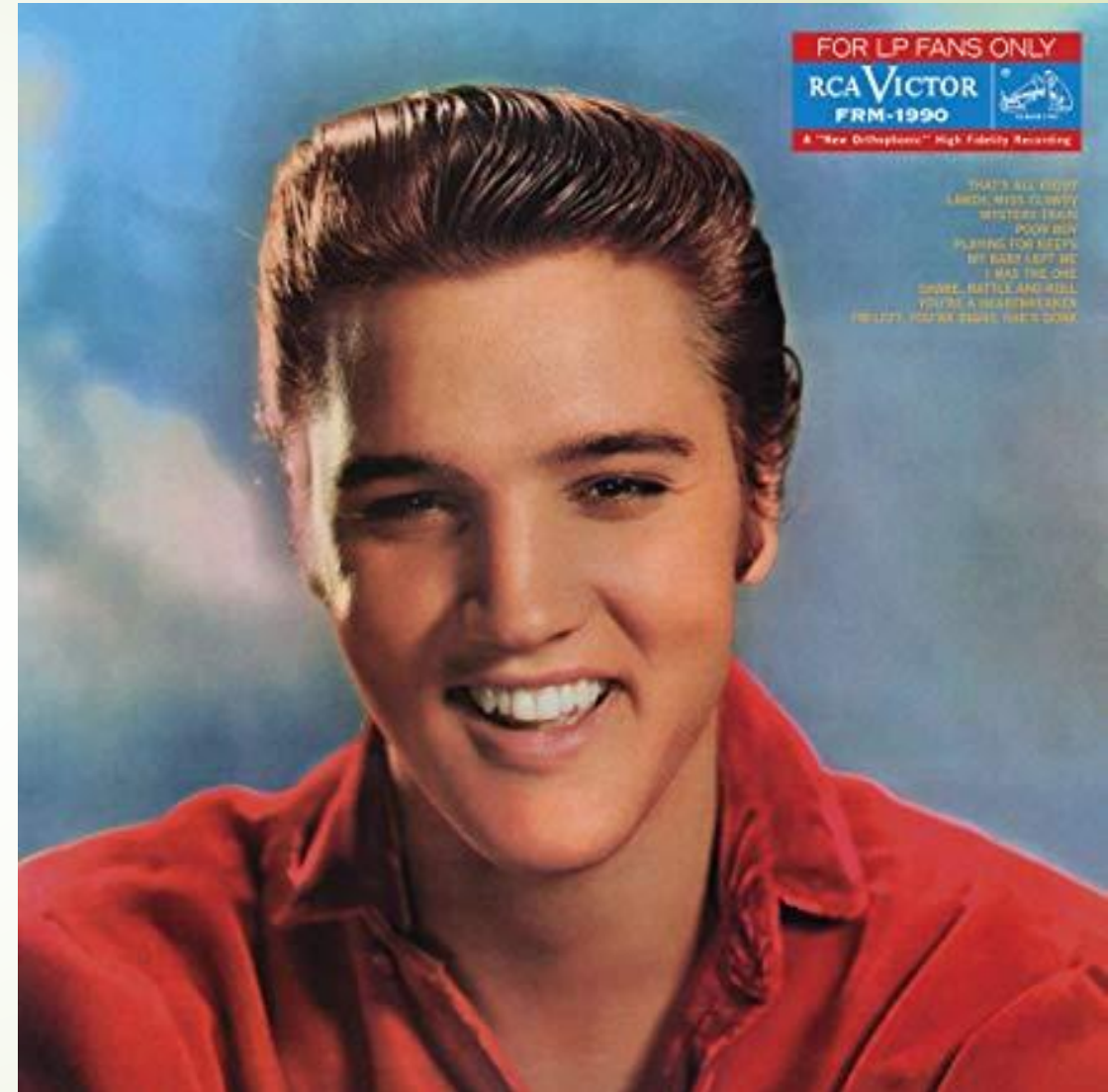


Music Related Apps: Discogs and Music Bee



How Many Times Can You Buy The Song "Heartbreak Hotel?"

1. 78 rpm record
2. 45 rpm record
3. EP 45 rpm record
4. LP containing this song
5. 8-track containing this song
6. Cassette containing this song
7. Compact Disc containing this song
8. Downloaded MP3 file
9. This LP is available today from Amazon for "only" \$32.98 titled "For Fans Only Audiophile Translucent 60th Anniversary"



Questions?

How Technology Has Changed The Way We Listen To Music

Ray Baxter, Payson Meet-Up Computer Club
Payson, Arizona

ray@paysoncomputer.club
rbaxter@apcug.org

