

HOW TECHNOLOGY HAS CHANGED THE WAY WE LISTEN TO MUSIC

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Ottawa PC Users Group

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.
- ▶ Former 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), that meets weekly via Zoom, and monthly in person to jointly listen and/or watch music related YouTube videos while discussing the early days of Rock & Roll
- ▶ Co-founder of local music listening club that meets monthly at rotating member's homes where we discuss and watch YouTube music related videos of all types of popular music from the last 70 years

▶ Technology Related

- ▶ Treasurer Association Personal Computer User Groups
- ▶ Coordinator for the Payson Meet-Up Computer Club in Payson, AZ
- ▶ Formerly Adjunct Instructor at the Payson campus of Eastern Arizona College teaching three computer related courses



Part One

How Technology Has Changed
The Way We Listen To Music at Home



A Brief Introduction to Ray's "Man Cave"

See: 2026-01-ManCave.mp4

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?**



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 hear 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

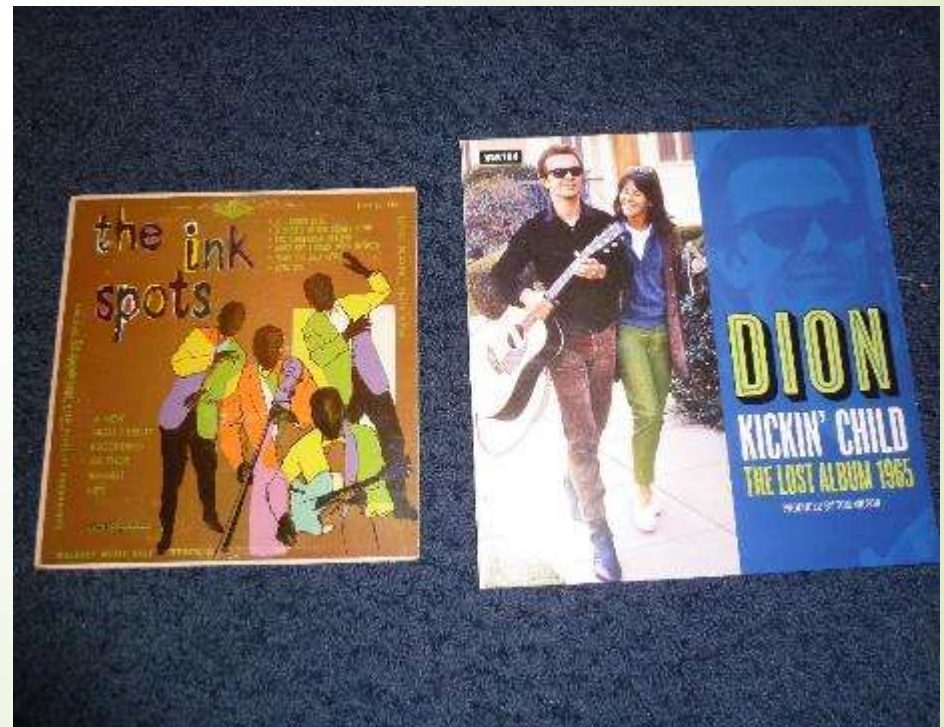
- Developed and introduced by the Columbia Broadcasting System in 1948 to improve upon the decades old 78 RPM format.
- At the time Columbia's archrival RCA Victor was the largest record label for distributing 78 rpm records.

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 public was already use 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?



How Many Can Relate To This?



WHEN I WAS A KID

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

Personal Story - Nature or Nurture

- I was adopted and found my birth family in the 1990s. I learned my birthfather Sam played the accordion and harmonica and was an avid record collector of Irish songs and pop hits of the day.
- My birthmother's son Joe is such a Beatles' fan that he named his first son Sean following the lead of John Lennon.
- My adopted parents provided me with a wonderful life and while they had little interest in music, on my 11th birthday I received my first phonograph.
- In 1957 I purchased the record "That Will Be The Day" by Buddy Holly & the Crickets. Little did I know that Sam had purchased the same record at the same time.
- I have yet to meet anyone close to my age where the parent and child were buying the same music in the 1950s.

“That Will Be The Day” from 1957

Sam's 78 RPM



Ray's 45 RPM



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

Brief History

- 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



Philco Cassette Deck for USB Copying

- If you have “one of a kind” tapes (e.g., voice of a departed loved one) that you want to digitize here is a solution.
- As you play the cassette, in real time the audio is copied to the inserted flash drive.
- The deck has a built-in speaker and is self contained



Timelines For The Compact Disc

- In mid 1970s both Sony and Phillips were involved in the research and development of optical disc technology
- As I recall the first commercial CDs were expensive and consisted of mostly classical music
- First pop album on CD in 1982 was Billy Joel's 52nd Street
- 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 (with the exception of 2021).

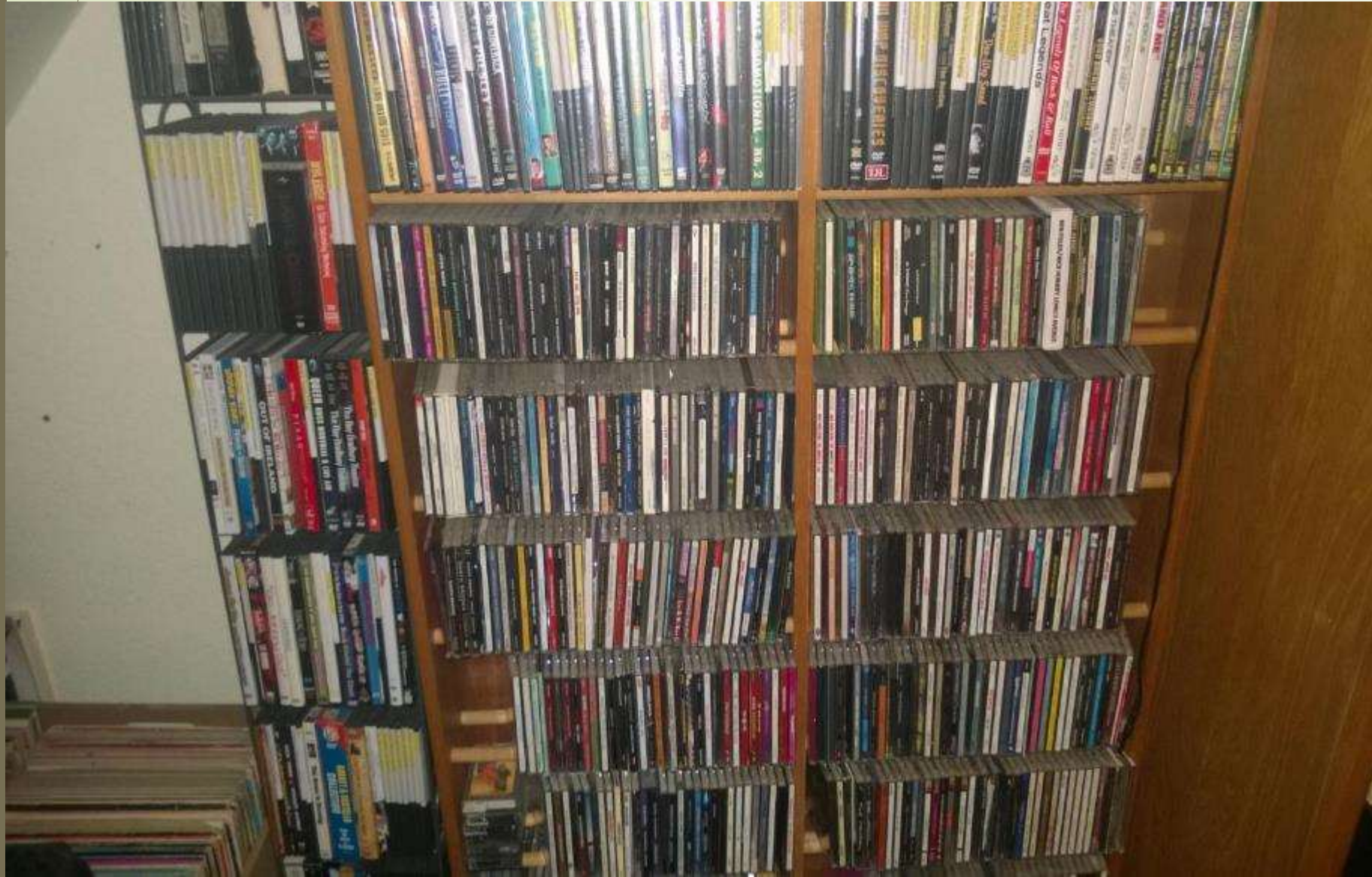
How Does A Computer Know What Songs Are on a CD?

- ▶ Music CDs were first introduced to the public before the PC became common in the home so for all music CDs 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, but it can happen
- ▶ There are several online music databases with Gracenote being the most popular
- ▶ If you're not connected to the internet, the responses for artist will be unknown, and the listing will be Track 1, Track 2, etc.

Do you copy your CDs to your computer?

- It's always been a good practice to "rip" a music CD to your computer for "**back up**" purposes.
- In addition, this allows your collection to be organized so a song can be found quickly by title, artist, or album name
- In addition, the music you already own can then be downloaded to your Smartphone and played without a streaming expense.

Guess How Long It Took to Rip These?



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.
 - 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.
 - Apple discontinued making the iPod in May 2022.

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 CD audio recording WAV file without noticeable loss of sound quality.
- Many audiophiles disregard the MP3 and instead opt for “lossless” recordings with full fidelity (such as FLAC).

The impact of the MP3

- Portable MP3 players which can hold thousands of songs were very popular until the advent of this feature in smartphones.
- Most modern car stereos have a USB connector allowing flash drives containing thousands of songs to be played while driving.

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 Music, and others flourished replacing music purchases from brick-and-mortar locations.

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.

The Best Music Streaming Services

Check out the CNET article [**“Best music streaming services for 2026”**](#) for an in-depth review of all these music streaming services and more

- **Best Music Streaming Service Overall: Apple Music.** It is favored for its vast 100-million-song catalog, high-resolution and spatial audio included at no extra cost, and seamless integration with the Apple ecosystem.
- **Best for Discovery and Ease of Use: Spotify.** While criticized for lacking high-resolution audio, it remains the leader for personalized recommendations, social sharing features, and intuitive interface.
- **Best for Serious Audiophiles: Qobuz.** Recommended for those who prioritize high-fidelity sound and wish to purchase high-resolution tracks alongside streaming.
- **Best Value for Prime Members: Amazon Music Unlimited.** It offers a discounted rate for Amazon Prime subscribers and features a massive library with HD audio.
- **Best for Music Video Fans: YouTube Music.** It stands out for its unique ability to switch between audio and official music videos, plus its deep integration with user-uploaded
- **Best High-Resolution Alternative: Tidal.** Recognized for its direct artist payment initiatives and its robust high-res, lossless, and spatial audio offerings.

Pros and Cons of Music Streaming Services

Advantages

- ▶ Listen to who else recorded a favorite song
- ▶ Listen to other songs a favorite artist recorded
- ▶ Introduces new artists that otherwise you might never hear
- ▶ Access to millions of recorded music songs

Disadvantages

- ▶ Free services have limitations on the music you can hear
- ▶ Need an internet connection
- ▶ When not using Wi-Fi your monthly data allotment is being used
- ▶ Premium services have a cost.

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.
- An example would be a streaming service paying an artist \$0.0032 per stream which equals **1 cent for every 3 plays**

Most Streamed Artists All-Time

- These rankings are based on total cumulative streams across major audio platforms, primarily Spotify and YouTube:
- **Taylor Swift:** The most-streamed artist in history, surpassing 117 billion streams as of early 2026. Total estimated royalties US\$487 million
- **Drake:** Holds the second spot with over 97 billion streams as a lead artist. If "all-credits" (including features) are counted, he often ranks even higher.
- **Bad Bunny:** The top Latin artist globally, with over 101 billion streams. He has been the most-streamed artist in a single year for a record four times (2020–2022, 2025).
- **The Weeknd:** Amassed over 80 billion lead streams. He holds the record for the most-streamed song of all time, "Blinding Lights".
- **Ed Sheeran:** A long-time leader who was the first to reach several follower and stream milestones, currently exceeding 51 billion streams.

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

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
- Theatrical movies were made to showcase the R&R stars of the day. Various archives have saved these clips over the decades and 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 see the sun rising

Music Apps to download to your Smartphone

Ever hear a song playing but can't recall the name or artist? With **Soundhound** or **Shazam** apps on your smartphone you will learn the

- ▶ Song Title
- ▶ Artist name
- ▶ Lyrics
- ▶ Video if available
- ▶ Top songs from this artist, and more
- ▶ Want a music player for your Android smartphone now that Google Play Music is retired?
 - ▶ **Musicrolet** is my music player of choice for the songs saved on my Android smartphone; features I like best include
 - ▶ Ability to search by voice
 - ▶ Free with no ads or need for internet access
 - ▶ Many features including tag editor, equalizer, and headphone control

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.



Are LP's Taking Us Back To The Future?

- ▶ According to Rolling Stone magazine, the sale of vinyl records in 2020 generated more annual income than compact discs for the first time since 1986
- ▶ CD sales had been declining three times as fast as vinyl sales.
 - ▶ In 2021 CD sales increased by 1.1% from 2020 with experts attributing this to Adele's top selling CD titled "30"
- ▶ A reality check reminds us that streaming remains the most popular way to consume music, accounting for over 80% of industry revenues in the U.S.

Are LP's Taking Us Back To The Future?

Something Old



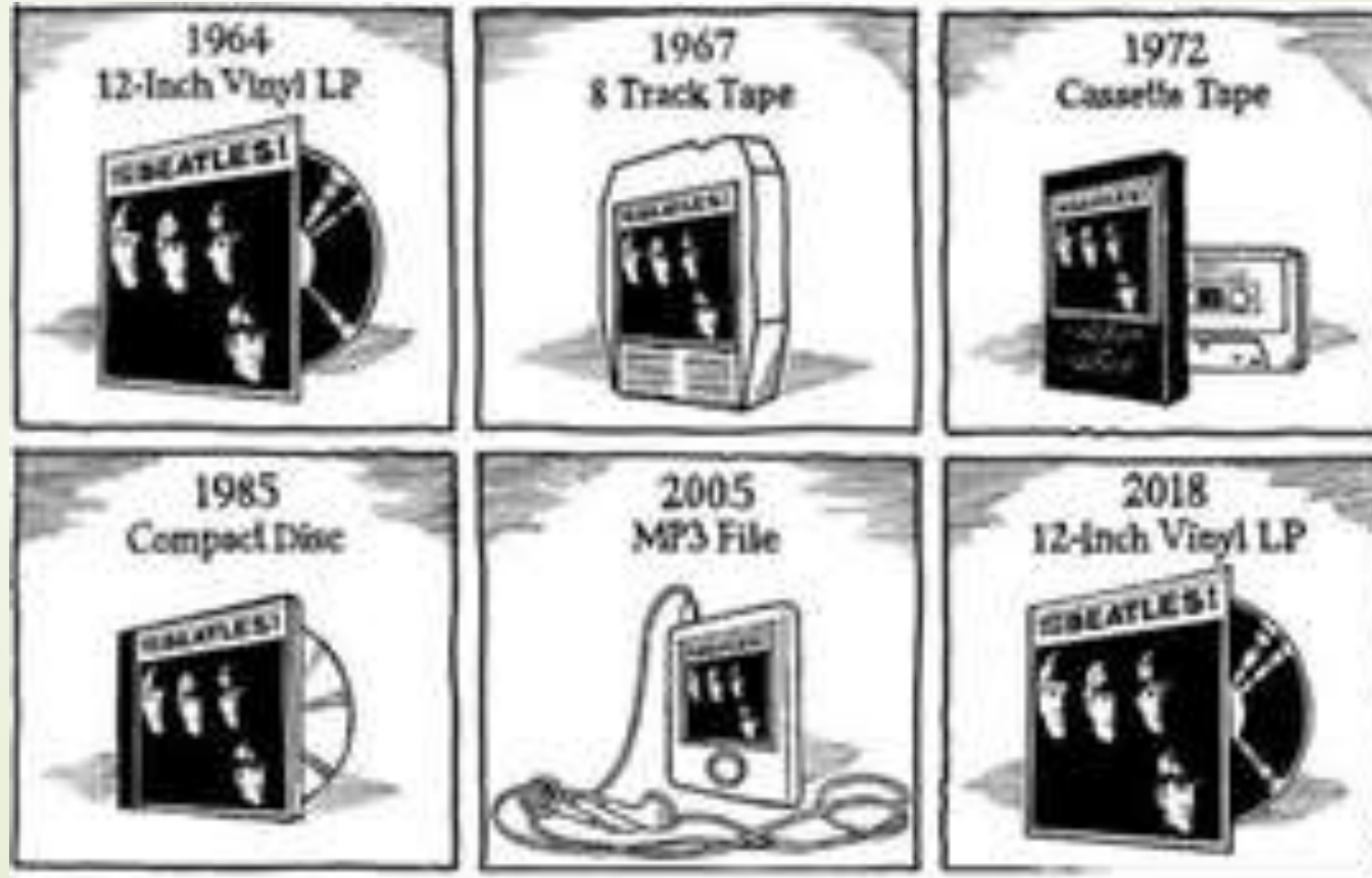
Something New



Interesting and Revealing Statistic

- ▶ According to recent data, only half of the consumers who have purchased vinyl records own a turntable or record player.
 - ▶ In other words, a significant portion of buyers lack the equipment to play the records they have purchased.
- ▶ The reason is they want something tangible, something they can hold in their hand to show support for their favorite artist, while at the same time using more modern methods to listen to the actual music.
- ▶ Obviously, long-time record collectors have and continue to use a turntable (I have two in my home and a spare in storage).
- ▶ The resurgence of vinyl records and the nostalgia associated with turntables has led to increased sales which I expect to continue.

Have We Gone Back To The Future?



Music File Formats

High Quality = Large File Size

Average Quality = Smaller File Size

The different file formats



Popular, compressed format ensures small file size, but not the best sound quality. Convenient for storing music on smartphones



An alternative to MP3, it's still lossy and compressed but sounds better. Used for iTunes downloads (at 256kbps) and YouTube streaming



The standard 16-bit/44.1kHz format all CDs are encoded in. Good quality, but huge, huge file sizes. Poor metadata support



Lossless compression format supports high-resolution sample rates, takes up much less space than WAV and stores metadata



Apple's own lossless compression format does hi-res, stores metadata and takes up half the space of WAV. iTunes-friendly alternative to FLAC



The format used for Super Audio CDs. It comes in 2.8MHz and 5.6MHz varieties, but isn't widely supported elsewhere

What Is Hi-Res Audio and Should You Care

- ▶ Streaming services like Tidal and Amazon Music HD are touting their ability to stream music to smartphones and most digital hi-fi components as High-Resolution Audio
- ▶ Simply put Hi-Res audio are music files that have a very high sampling frequency and/or bit depth
 - ▶ Positive - a higher quality sound reproduction
 - ▶ Negative – requires expensive high-end speakers or headphones to receive the full benefit

What Is Hi-Res Audio and Should You Care

- ▶ Bottom line
 - ▶ Type of music you listen to – soft vocals vs. classical or rock with lots of instrumentation
 - ▶ Type of speakers you listen with – inexpensive ear buds vs. high quality headphones or tower speakers
- ▶ Take the Music Listening Blindfold Test by picking a favorite song and having a friend play it on the same equipment alternately from the original CD and then from an MP3 computer file
- ▶ If you can correctly tell the difference, hi-res audio may be a worthwhile investment for you
- ▶ If you are like me and are unable to notice a stark difference, you've just saved a bunch of money

Best of Both Worlds

“Shivers” by Ed Sheeran from Equal (=)

Plex App on TV

Vinyl LP Record





Part Two

How Technology Has Changed The
Way We Listen to Music In the Car

Listening To Music In Your Car

How Far We've Come
From the AM Radio



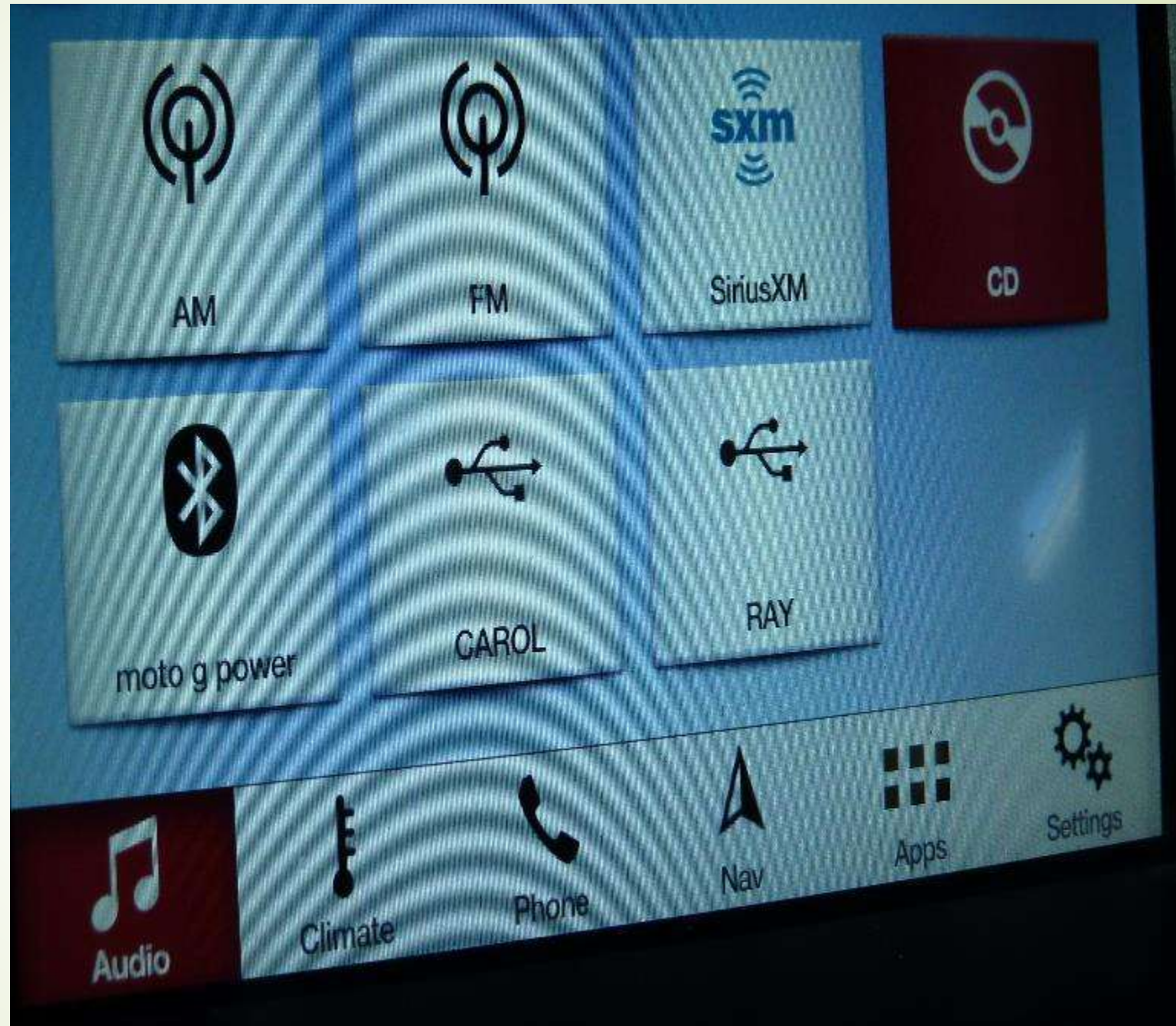
Music In The Car Has Evolved

- Starting with an AM radio
- Add Station Push Buttons
- Add FM radio
- Add 8-track Player
- Add Cassette Player
- Add CD player (then multiple disc players)
- Add Satellite Reception
- Add Wired connection
- Add Flash Drive connection
- Add Bluetooth connectivity

Today the options for music in the car are numerous and can be confusing

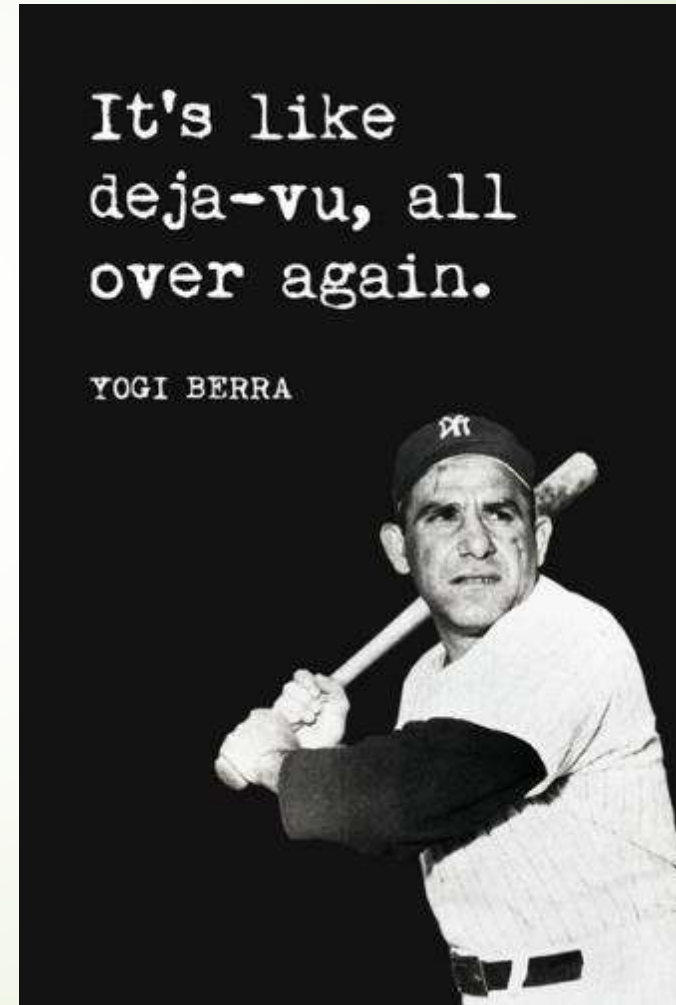
Choices Include:

- AM Radio (sometimes AM Stereo)
- FM Radio (may include HD-FM that offers up to 3 additional channels on same frequency)
- SiriusXM satellite radio with 100+ channels of music, news, sports
- USB connections with later model cars offering connectivity for two drives including USB-C
- Bluetooth connectivity to play streaming music as well as songs saved on smartphone
- CD players have disappeared from new cars



“It’s Like déjà-vu All Over Again”

- The above quote is of course from famed New York Yankees catcher Yogi Berra
- Most of us can recall when the following disappeared from cars:
 - 8 track tape players
 - Cassette tape players
- Now, in addition to the CD player disappearing, my 2019 Ford Edge doesn’t even have the simple audio cord input connection



Why Don't New Cars Have CD Players?

- ▶ Time for new technology to take over as Car CD players have been around for more than 30 years
- ▶ Requires the user to have physical presence of the media (a compact disc and usually the jewel case) while that is not necessary with newer technology
- ▶ Music CD sales had been declining since 2004 (although 2021 saw a brief uptick) as younger listeners opt for newer methods to hear their favorite artists and tunes
- ▶ Auto manufacturers are now providing newer technology so they can eliminate the expense of a CD player which today has limited appeal with younger consumers

Decide How You Want To Proceed

- Option 1: Convert (rip) the songs from your existing Compact Disc collection to computer files so they can then be copied to devices to play the music in your car
- Option 2: Choose a streaming service and play the music in your car from your smartphone via Bluetooth or a wired connection
- Option 3: Be like me, and use both

Windows Media Player and CD Metadata

- ▶ Since mid December 2025, Windows Media Player (as well as the older “Legacy” version) have stopped retrieving CD info to include the album name, artist, and track titles during the ripping process.
- ▶ CD data is not stored on the CD itself but is automatically retrieved from an external metadata provider.
- ▶ While Microsoft has not issued any statement regarding this issue, the latest reporting say they have intentionally shut down the service and have no intention to restore it.
- ▶ An official reason has not been forth coming but many conclude Microsoft feels too few users still play CDs to justify the service.

Very Disappointed In MS Decision

- ▶ While it is true there are fewer people playing CDs today, for many years my focus has been encouraging users to rip their CDs so they can take advantage of more modern ways to listen to the music they have purchased and own. I do not understand why Microsoft did not take this into consideration before shutting down this feature in Media Player.
- ▶ The good news for Apple and Linux users is their ripping apps continue to work with retrieving this necessary data.
- ▶ I now use a program called **EZ CD Audio Converter Free** with my Windows computers that is available at the MS Store.
- ▶ This YouTube link provides an easy-to-understand tutorial.
- ▶ <https://www.youtube.com/watch?v=7ZBHJP6v-9M>
- ▶ I'll put this link in the Chat box.

Option 1

Convert Existing CD Music Files to MP3

- Over the many years this is a process I would perform as soon as I purchased a new CD for all the obvious back-up benefits.
- Interestingly, I have found that when I asked the question “Who rips their CDs?” most folks responded they did not take the time to do this.
- With the recent decision by Microsoft not to support CD ripping, perhaps now is the time to begin the process before ripping CDs becomes completely outdated.

Ripping CDs to your computer requires an optical drive



- For those newer laptops that do not have an optical drive, external units that plug into a USB connection are readily available
- The units for CDs and DVDs are reasonably priced but for Blu-Ray discs, these players/recorders are more expensive

Change In My Approach to This Presentation

- In the past when making this presentation I included several instructional home-made videos of the various audio related devices I was using at the time in my 2018 Ford Taurus Limited (which has since been totaled) and a 20-year-old motorhome (which has since been sold).
- Fast forward to today, and there are countless YouTube videos that explain the steps to be taken specifically geared to the make and model of a particular car – perhaps the one you own.
- So now I'll list the instructional steps in the slide, and if you want further video instructions specific to your vehicle, you can copy the slide title into the YouTube search box to locate a corresponding clip.
- When related to computer functions, my commentary will assume you are using Windows 11.

“Ripping a Music CD To My Computer”

- Insert the music CD in the computer's optical drive.
- Open the CD ripper of your choice and the disc information should automatically appear.
- Click on Rip settings and choose mp3 for format and 320 kbps for Bit rate. For higher quality (and larger file size), choose FLAC.
- Save choices and choose Rip CD.
- The saved music files should appear in your Music folder.
- Copy the album and music files to a flash drive or your smartphone.

“Use A Flash Drive for Music In The Car”

- Insert flash drive with loaded songs into the car's USB connector.
- Songs will appear on the infotainment screen and begin to play.
- In addition to standard dashboard controls, and electronic choices on screen, most cars will have ability to make volume and song choice from steering wheel buttons for safer driving.
- When multiple albums are on flash drive, infotainment screen will allow for “Source” choices so you can pick the one you want to play.
- Ability to verbally request songs and/or artist is the best feature to allow hands-free usage thus improving safe driving.

Getting Sound to the Car's Speakers From A Smartphone

- Bluetooth systems allow you to pair your smartphone with the car stereo head-unit to play music wirelessly.
- Audio Jack Cable – while starting to disappear, older smartphones have an audio jack that is typically used with wired headphones but can also be used with cars that have this type connection.
- FM Transmitter – by plugging into DC power slot, allows music to play from device to an unused FM station on the car's radio.

“Using Bluetooth to pair Phone to Car’s Head Unit”

- There are many YouTube videos that show how to accomplish the pairing as it differs slightly from each auto manufacturer.
 - Your car dealer is another option that can help in this regard.
- With most cars you can pair more than one phone so passengers can also play music from their phone for others in the car to hear from the car’s built-in speakers.

Option 1: Play Songs Stored on Your Phone

- Begin by bringing up the song or artist on your phone and begin to play.
- Using the car controls (on screen, dashboard or steering wheel) adjust for volume and song choice.
- Most phones come with a player but there are others than can be downloaded for use.

Option 2: Choose a Music Streaming Service

- Most streaming services provide 2 listening choices
 - Choice 1 is to use the free service with ads and where the service decides what songs to play in the genre you prefer.
 - Choice 2 is to pay for the service (typically \$10 or more monthly) where you choose the songs and artists you want to hear without ads.
- Streaming service leaders include Spotify, YouTube Music, Apple Music and Amazon Prime
 - For those already paying for Amazon Prime, this is an included benefit and an excellent way to experience a streaming service at no extra cost.
 - Amazon also offers a premium (pay) service called Amazon Music Unlimited with upwards of 100 million song choices available.

“Use Music Streaming In the Car via Bluetooth”

- This method begins with your phone being paired with the car's head unit via Bluetooth.
- Bring up your preferred streaming service app on your phone.
- Type in artist name to see different album and song choices.
- As the music plays on the phone, it will be heard from the car speakers.
- Track selections and volume control can now be done from the phone or the car's steering wheel or dashboard.

“Using Audio Cable in an Older Car to Play Music From Phone”

Connect Your Phone to Car Audio System
Enjoy your music any time, any place



- Older cars without Bluetooth capability often allow for a wired connection.
- Connect audio cable from phone to the car's audio jack.
- Best to have phone in holder attached to dash for easy selection of choices.

Use Cassette Adapter

This is for older cars that have a built-in cassette player.

The adapter slides into the car's cassette player while the connector end plugs into your phone or an mp3 player.

This allows the sound from your phone to be heard thru the car's speakers.



FM Transmitter For Older Cars Without Modern Audio Features

Bluetooth FM transmitters plug into the DC power for hands free phone calls and music playing thru car speakers

Use Bluetooth or attach audio cable between speaker jack of FM transmitter and the device that will be playing your music, e.g., cell phone

FM transmitters often accepts USB and/or SD cards with stored music

Configure the FM Transmitter to send audio sound to a “not-in-use” FM radio station, then listen to your music on that station on your car FM radio



Other Options

- ▶ Android Auto is a mobile app that allows features from an android phone to appear on a car's compatible entertainment head unit, and be voice operated
 - ▶ Works primarily on car models 2017 and later
- ▶ Apple Car Play software runs from a connected iPhone to provide a variety of audio features like Android Auto
 - ▶ Works primarily on car models 2016 and later

Infotainment Screen Changes When Android Phone Plugged into USB Port

Ford Sync 3.4 Screen



Android Auto Screen



Android Auto

- You should use the USB-C cable that came with the phone or one that is made for “Android Auto” because some USB-C aftermarket cables are only for charging and will not work.
- If your vehicle does not have a factory installed navigation app, Android Auto is a smart way to have your route appear on the larger infotainment screen

Android Auto Wireless Adapter

Initially to utilize the benefits of Android Auto required having your Android phone physically plugged into the car's USB connector

Plugging and unplugging your phone each time you enter and leave your car can be annoying, so wireless adapters became available.



Apple Car Play

- Apple Car Play is similar in function to Android Auto except that it is made to work with iPhones and all the Apple apps including maps, music, text messages, and talking on the phone without holding the device
- Apple continues to add more benefits to Car Play. A recent feature is called “Car Keys” which allows you to leave your keys at home since you’ll be able to unlock and start your car with your iPhone using NFC tap technology

Factory Installed

Android Automotive and Apple Car Play

- Relatively new, and in contrast to Android Auto, Android Automotive is a full operating system installed at the factory running the vehicle's infotainment system and not relying on a smartphone to be present for its operation
- Messaging, phone, navigation, music playback as well as vehicle-specific functions such as controlling air conditioning are part of the operating system
- A similar situation with Apple Car Play where the operating system can be ordered as a new car option
- When you are ready to buy a new car be sure to see if the model you are interested in has such availability

Music Formats Will Continue to Change

One certainty
with technology
- it's always
evolving.

Either you
evolve with it or
get left behind.



Questions?

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