Recording Technology History

notes revised July 6, 2005, by Steve Schoenherr

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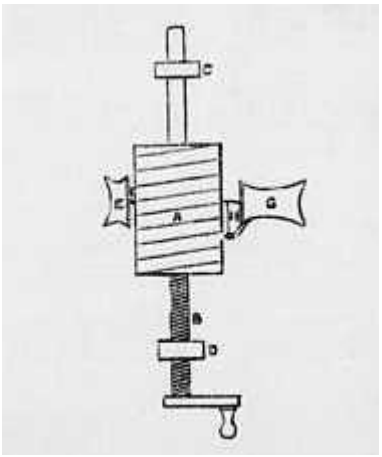
What's New



Origins

1877 - Edison made the first recording of a human voice ("Mary had a little lamb") on the first tinfoil cylinder phonograph Dec. 6 (the word "Halloo" may have been recorded in July on an early paper model derived from his 1876 telegraph repeater) and filed for an American patent Dec. 24. John Kruesi built this first practical machine Dec. 1-6 from a sketch given to him by Edison that was made Nov. 29 (not on "Aug. 12" that Edison mistakenly wrote on another sketch in 1917). When Kruesi heard Edison's first words Dec. 6, he exclaimed "Gott in Himmel!" (but these words for "God in Heaven" were not recorded and thus have been forgotten). Others before Edison had tried to record sound, but Edison and his tinfoil phonograph were the first to succeed.

Scott phonautograph from before Edison

Mary had a little lamb on Edison tinfoil cylinder

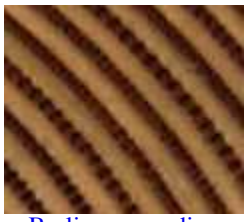
1878- Edison was granted patent 200,521 on Feb. 19 for a phonograph using cylinders wrapped with tinfoil with 2-3 min. capacity. None of these early fragile tinfoils have survived, but after Edison experimenters used different recording materials, such as the lead cylinder of Frank Lambert that is known today as the oldest surviving playable cylinder ("One o'clock, Two o'clock"), and the brass

discs of Augustus Stroh in England ("mama" and "papa").


engraver 1888
from Gramophone

1881 - Charles Tainter at the Volta Lab made the first lateral-cut records, but without any practical machine to play them back.

1885 - A second type of phonograph was invented by Chichester Bell and Charles Tainter; they were granted patent 341,214 on a machine that they called the "Graphophone" using wax-coated cylinders incised with vertical-cut grooves; see photos from Smithsonian and the essay Tainter and the Graphophone.


Berliner recording
on lateral groove

1887 - A third type of phonograph was invented by Emile Berliner; he was granted patent 372,786 for a "Gramophone" using a non-wax disc photo-engraved with a lateral-cut groove; see pictures of the three rival phonographs.

1887 - Edison filed an application Nov. 26 for patent 386,974 on an improved phonograph using a battery-powered electrical motor and wax cylinders, but neither he nor the graphophone inventors were able to mass-produce copies.


Edison ad from LC

1888 - Emile Berliner demonstrated an improved early gramophone May 16 at the Franklin Institute using a flat 7-inch disk with lateral-cut grooves on one side only, hand-cranked at 30 rpm with 2-min. capacity; Berliner was the first to mass-produce hard rubber vulcanite copies from a zinc master disk.

1889 - The Columbia Phonograph Co. was organized January 15 by Edward D. Easton with rights to market a treadle-powered graphophone; however, Easton would have more success selling music rather than business machines, especially cylinders of the popular United State Marine Band under John Philip Sousa. Easton produced the first record catalog in 1890, a one-page list of Edison and Columbia cylinders.

Cylinder vs. Disc

1890 - The first "juke box" was the coin-operated cylinder phonograph with 4 listening tubes that earned over $1000 in its first 6 months of operation starting the previous November 23 in San Francisco's Palais Royal Saloon, setting off a boom in popularity for commercial nickel phonographs that kept the industry alive during the Depression Nineties.

1893 - Emile Berliner finally began to succeed with his new U. S. Gramophone Company; in 1894 he made and sold 1000 machines (some electric-powered, most hand-powered, but no spring motor yet) and 25,000 records (7-inch hard rubber discs). The Berliner Gramophone Co. was incorprated Oct. 8, 1895, and Berliner discovered in 1896 that shellac from the Duranoid Co. was better than hard rubber for records; Frank Seaman created the National Gramophone Co. Oct. 19, 1896.

1894 - in December, Guglielmo Marconi made radio history when at the age of 20 he invented his spark transmitter with antenna at his home in Bologna, Italy. He took his "Black Box" to Britain in Feb. 1896 and although it was broken by custom officials, he filed for British Patent number 12039 on June 2, 1896, and began to build a world empire of Marconi companies.

1896 - Eldridge Johnson improved the gramophone with a motor designed by Levi Montross and his own patent 601,198 filed Aug. 19, 1897, for a simple and inexpensive machine that became the most popular disc phonograph by 1900; he then merged his Consolidated Talking Machine Co. with Berliner's company to create the Victor Talking Machine Co. in 1901 with the "little nipper" dog as trademark.

1897 - shellac discs replaced vulcanite, but the typical heavy steel stylus tracking at 9 oz. caused heavy wear; with the introduction of low-cost talking machines such as the Columbia Eagle graphophone and the Edison Gem cylinder and the Berliner improved gramophone, strong growth in sales began of commercial cylinders and discs, mostly classical and Tin Pan Alley songs.

1898 - Valdemar Poulsen patented in Denmark on Dec. 1 the first magnetic recorder, called the "telegraphone," using steel wire; he exhibited his device at the Paris Exposition in 1900 and formed the American Telegraphone Co. in Nov. 1903 after Congress validated his American patent 661,619.

1900 - Thomas Lambert developed a successful method of mass-duplicating "indestructible" cylinders of celluloid; his patent 645,920 described making a copper negative matrix by electrolysis from a wax master, and using heat and pressure to "mould" durable celluloid copies from the matrix. Although Lambert's patent was upheld by the courts, Edison would use expensive lawsuits to drive Lambert's company and the Indestructible Phonograph Record Company out of business by 1907.

Indestructible cylinder case, see record labels

1902 - Edison introduced "Gold Molded" cylinders for $.50 each with an improved hard wax surface and able to be mass-produced by a molding process; in Europe "Red Seal" 10-inch discs with 4-minute capacity were sold for $1.00, each featuring famous European artists, such as tenor Enrico Caruso and baritone Mattia Battistini. The first Red label records were made in Russia by Fedor Chaliapan, singer for the Imperial Opera, who recorded 10 records for Fred Gaisberg and the Gramophone Co. April 11 in Milan; Victor began to import these celebrity labels in 1903 and became the leading seller of classical music records. The 10-inch disc would quickly become more popular that the previous 7-inch standard disc that could only play for 2-3 minutes.

1903 - Eldridge Johnson began to sell the Victor IV phonograph, the first model equipped with his tapered tone arm, patent 814,786 filed Feb. 12.

1904 - The Odeon label was created in Germany by the International Talking Machine Co. to sell double-sided discs that Zonophone had pioneered in South America in 1902, based on patent 749,092 by Ademor Petit, yet it was still impossible to put an entire symphony on a single disc that could play both sides for no more than 10 minutes. HMV in England recorded in 1903 the first complete opera, Verdi's "Ernani" on 40 single-sided discs. Odeon pioneered something called the "album" in 1909 when it released the "Nutcracker Suite" by Tchaikovsky on 4 double-sided discs in a specially-designed package.

1906 - Columbia announced in July the Velvet-Tone thin and flexible laminated shellac record with paper core, following the proposal of Marconi who had visited the Bridgeport plant of the American Graphophone Company. This record had less surface noise than regular shellac records.

1906 - Victor introduced the first all-enclosed cabinet phonograph that by 1907 was being widely

advertised as the "Victrola" upright with enclosed tapered horn; Victor would spend $50,000,000 on print advertsing and $17,000,000 on catalogs and brochures by 1929, creating the generic name victrola that is applied to all phonograph players designed as furniture.

1906 - William Randolph Hearst in October began to use cylinder recordings of his speeches in the election campaign for governor of New York. The wax graphophone masters were made by Columbia in New York City, electroplated and molded, played at public meetings and distributed to libraries for public check out.


Dictaphone 1907
see pictures

1907 - The Dictaphone Corporation was organized when the Columbia Graphophone Co. sold its business machine division.

1908 - John Lomax, on his first trip west, recorded a black saloon keeper in San Antonio singing "Home on the Range" on an Edison cylinder and the lyrics were written down and published in the book "Cowboy Songs and Frontier Ballads" by Lomax in 1910 and the song became a national favorite; Lomax and his son Alan would record 10,000 songs for the Library of Congress Archive of the American Folk Song.

1910 - John McCormack signed his recording contract with the Victor Co. that would result in hundreds of recordings made over the next 20 years.

1911 - Edwin S. Pridham and Peter L. Jensen in Napa, California, invented a moving-coil loudspeaker they called the "Magnavox" that was used by Woodrow Wilson in San Diego in 1919.

1912 - Edison introduced celluloid blue Amberol cylinders that played for 4 minutes. When played with a diamond stylus, the new cylinder had low surface noise that resulted in higher acoustic quality than flat discs.

1913 - Edison finally conceded victory to the flat disc when he began to sell the Diamond-Disc players and recordings. The Diamond discs had a surface of Condensite plastic laminated to a solid core and a thickness of 1/4 inch. Condensite was a resin plastic like Bakelite, the first artificial plastic patented in 1909 by Leo Baekeland. The players used the same Diamond Point Reproducer used in the Blue Amberols but tracked at heavier force; see pictures of the Diamond Disc phonographs.

1914 - ASCAP founded to enforce 1909 Copyright Act.


1914 vacuum tube by AT&T
came from radio

1915 - U.S. Navy seized Telefunken radio station at Sayville, Long Island, that was using Telegraphone wire recorders to send high speed transmissions to Germany.

1915 - Edison suggested in 1915 that the U.S. create a Naval Research Laboratory - picture of Edison sculpted from life.

1916 - Theodore Case founded his Case Research Laboratory in Auburn, New York, to develop a sound-on-film recording system for motion pictures to compete with Edison's sound-on-cylinder system; Case and Earl Sponable developed the Thalofide photo-electric cell used by the Navy in WWI to transmit secret messages by infrared light.

1917 - Over There recording written by George M. Cohan, performed by Billy Murray. "Written in 1917 and introduced by the famous singer Nora Bayes, this World War I hit became the anthem for America's war effort." (from Library of Congress)

1918 - first wartime actuality sound recording of gas shell bombardment.

1918 - Poulsen's 1898 Denmark patent expired; Germany developed improvements to the wire telegraphone; see picture.

New Popular Music

Columbia Grafonola ad from *Literary Digest*, 1919/09/27

1917 - The first "Jazz" record "Livery Stable Blues" was recorded by the all-white Original Dixieland Jass Band from New Orleans, according to The Origins of Big Band Music. Jazz recordings stimulated the recording of the blues, first popularized by vaudeville performer Ma Rainey who became the first successful blues singer in 1902 and later recorded 100 songs 1923-1928 for Paramount as the "Mother of the Blues," by black composer W. C. Handy in 1911, and by Mamie Smith who recorded the first vocal blues song, "Crazy Blues" in 1920, on the Okeh label.

1919 - Gennett Record Company in Indiana began to make lateral-cut records and was sued by Victor. Smaller labels such as Okeh, Vocalian, Compo joined Gennett in defending its claim that lateral-cut was in the public domain. Gennett won case 1921 before Judge Learned Hand and won appeal 1922 before Judge Augustus Hand, cousin of Learned. Gennett became one of the largest record producers in the nation, releasing some of the earliest jazz records of Jelly Roll Morton and opened the gates for smaller independent companies to record their own records.


early RCA radios, from NMAH

1920 - David Sarnoff in January proposed in a 28-page memo the "Sales of Radio Music Box for Entertainment Purposes" and led RCA into cross-licensing patents with AT&T and Westinghouse and to leadership in the broadcasting and recording industries by the end of the decade.

1920 - KDKA in Pittsburg inaugurated commercial radio when it was the first radio station to receive its commercial call letters from the Department of Commerce Oct. 27; it began regular scheduled broadcasting Nov. 2 with the returns of the presidential election, and continued broadcasting every evening from 8:30-9:30 pm.

1921 - Public address amplifiers and speakers developed by AT&T since 1916 were used at the Armistice Day ceremonies at the Tomb of the Unknown Soldier in Arlington Cemetery.

1921 - majority record sales began decline from $106 million high due to the growth of live radio, but new kinds of minority music become popular.

1921 - The Coon-Sanders Novelty Orchestra in Kansas City recorded "Some Little Bird" for Columbia, began regular radio broadcasts Nov. 1922 on the clear channel station WDAF, and recorded 65 songs for Victor 1924-32, becoming one of the nation's most popular big bands of the Jazz Age.


Bessie Smith, from LC

1923 - Bessie Smith's first record "Down-Hearted Blues" was an important landmark on The Blue Highway, selling 750,000 copies for the Columbia label in one year, and making Smith the "Empress of the Blues." Her recording of Handy's classic "St. Louis Blues" with Louis Armstrong on cornet for Columbia in 1925 was one of the finest records of the era, and led her to star in the 1929 RCA Photophone two-reel sound film *St. Louis Blues* with an all African American cast.

1923 - New York's WHN broadcast of the influential big band led by Fletcher Henderson.

1923 - Fiddlin' John Carson's "Little Old Log Cabin in the Lane" became the first hit country record.

1924 - Chicago's WLS started the National Barn Dance radio show.

1925 - The Rice-Kellogg research paper was published, establishing the basic principle of the direct-radiator loudspeaker with a small coil-driven mass-controlled diaphragm in a baffle with a broad midfrequency range of uniform response. On Nov. 28, WSM in Nashville ("We Shield Millions" slogan of owner Edwin Craig's National Life and Accident Insurance Co.) began its Barn Dance radio show (hosted by George D. Hay who had previously hosted the WLS Barn Dance show) that in 1927 became the Grand Ole Opry broadcast from WSM's Studio B on the new NBC network. The Grand Ole Opry moved to the the Ryman Auditorium in 1943 and with the Acuff-Rose1942 studio and WSM's 1947 Castle Studio would attract recording companies to Nashville's Music Row.


Bing Crosby in 1939 from Judy MacDonald

1926 - Bing Crosby recorded his first record "I've Got the Girl" with an old carbon mic; hired by Paul Whiteman to sing with Harry Barris and Al Rinker as "The Rhythm Boys" and began to use the new microphones developed by Bell Labs that encouraged the "crooner" sound when held close to the singer's mouth; see Der Bingle Technology for Harry Lillis Crosby's influence on records, radio, movies, audio and video tape recording. He is the No. 1 recorder of songs (1600 songs on 400 million records); the No. 1 recorded song in history remains *White Christmas* (35+ million copies sold since 1942); the first pop singer to win an Academy Award for Best Actor (in the 1944 film *Going My Way*); the No. 1 film box office star 1944-49; the No. 1 radio star 1931-1957.


Carter family from Birthplace Of Country Music Alliance

1927 - Ralph Peer held recording sessions on State Street in Bristol TN for the Victor company using the new electrical recording equipment made by Western Electric. The Bristol sessions have been recognized as "Big Bang of Country Music" that helped to launch the careers of the Carter Family and Jimmie Rodgers, the first commercially successful modern country music artists.

1929 - Paul Whiteman's Old Gold Special was the first national big band promotional road show.

Orthacoustic record from

Electric Era Replaces Acoustic Era - see pictures and articles

1925 - first electrically-recorded discs and Orthophonic phonographs go on sale, using Western Electric system developed at AT&T's Bell Labs over the previous

10 years, making it now possible to record whole orchestras and symphonies and even sound motion pictures (see Sound Recording Research at Bell Labs).

Electrical Era pictures

1925 - Warner Bros. joined Walter J. Rich to create the Vitaphone Co. and in October began making experimental sound pictures in the Warner Vitagraph studio in Brooklyn.

1926 - Vitaphone Co. signed a contract April 20 with AT&T to develop sound pictures using the electrical recording system of Western Electric, using 16-inch acetate-coated shellac discs at the new recording speed of 33 1/3 rpm in synch with film reel by electric motors; Warner Bros. moved the Vitaphone studio to the Manhattan Opera House in May and made some short subject musical films such as *Volga Boatman* on May 24 before releasing *Don Juan* on Aug. 6, the first full-length film with sound recorded for the musical scenes.

1926 - Charles Brush sold the first piezo-electric featherweight stylus.

1927 - On Jan. 1, Western Electric created Electrical Research Products, Inc. (ERPI) to license motion picture technology to the motion picture producers and exhibitors; Fox had acquired a Western Electric license in Dec. 1926 to use the AT&T electrical sound system in ts theaters to show Fox Movietone newsreels made with the rival sound-on-film method, starting Apr. 20 with marching West Point cadets; in July, Warner Bros. moved the Vitaphone production to Hollywood in the first studio built for sound; *The Jazz Singer* premiered Oct. 6, the first commercial sound film with spoken dialogue.

condenser mic 1928
from Neumann History

1927 - Automatic Music Instrument Co. of Grand Rapids (AMI) introduced the all-electric coin-operated phonograph, the "juke box," to replace coin-operated pianos, but few built before 1934.

1928 - Georg Neumann started his microphone company in Berlin and began production of the CMV3 "Neumann Bottle" condenser microphone.

1928 - John Baird in England developed an early form of mechanical television and recorded moving images and sound on Phonovision wax discs but Vladimir Zworykin in the U.S. and Manfred von Ardenne in Germany perfected the cathode ray tube for electronic television by 1929.

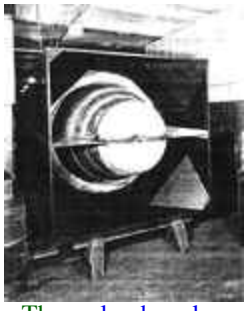
1929 - RCA began making "transcription" discs of vinyl "Vitrolac" from optical soundtracks for radio stations to play on the air; Magnavox developed the hum-bucking coil that reduced loudspeaker hum; final production of Edison cylinders and discs; merger of RCA and Victor.

1930 - Bing Crosby recorded his first solo "I Surrender, Dear" and became the nation's most famous crooner; signed by Bill Paley to CBS in 1931 and sponsored by G.W. Hill's Cremo Cigars; more radio stations began to play records of all kinds.

1930 - Albert L. Thuras filed patent No. 1,869,178 on Aug. 15, 1930, granted July 26, 1932, for the bass-reflex principle, and worked at Bell Labs on other designs significant in loudspeaker history

1931 - RCA tried to market coarse groove discs of "Vitrolac" vinyl plastic that ran at 33-1/3 rpm

"professional" speed, but it failed to replace popular 78 rpm consumer speed; however, the professional transcription disc coated with cellulose acetate remained the standard transcription disc for radio station recording until magnetic tape was adopted in 1948.


Thuras loudspeaker 1933, from AT&T Archives

1931 - In April Leopold Stokowski with his Philadelphia Orchestra used the vertical-cut recorder equipped with a new moving coil pickup with sapphire stylus developed at Bell Labs by Arthur C. Keller to improve the dynamic range of cellulose acetate discs pressed from gold-sputtered wax masters. When Stokowski later at Bell Labs in New York City heard the record of a performance of the "Roman Carnival" by Berlioz made on Dec. 1, 1931, he said it was the finest recording he had ever heard.

1931 - Empire State Building opened May 31 in New York City with music piped into its elevators, lobbies, observatories.

1931 - The EMI studio that opened Nov. 12 at Abbey Road in London, was the largest sound recording studio in the world; Louis Sterling hired Alan Blumlein to install Blumlein's own electrical recording system and Sterling stopped paying royalties to Western Electric. Alan Blumlein patented the "binaural" (stereo) recording method in England.

Music for the Masses

1933 - Homer Capehart sold Simplex changer mechanism to Wurlitzer, sold juke boxes to distributors who installed music systems in post-Prohibition grilles and taverns.

Rock-Ola
Rock-Ola 12-selection mechanism used in juke boxes

1934 - first U.S. advertisement for "High Fidelity" records; Duo Junior record player attachment for radios sold for $16.50.

1934 - Rock-Ola, Seeburg, Wurlitzer introduced multiple-selection nickel juke boxes; number installed in U.S. increased from 25,000 to 300,000 by 1939; Bing Crosby became #1 selection, spurring sales of his 35-cent Decca label songs.

1934 - Signal Corps General George Squier founded Muzak to sell recorded music to homes in Cleveland for $1.50 per month on 3 channels.

1934 - Swing music began in December with Benny Goodman on NBC's *Let's Dance*.

1935 - *Hit Parade* sponsored by G.W. Hill's Lucky Strike


Elvis at White House from National Security Archive

1935 - New York's WNEW is first music and news radio station; Martin Block was one of the first disc jockeys in his *Make Believe Ballroom* and earned $500,000.

1935 - Elvis Presley was born January 8 and died in 1977 after selling 41 million albums, recording 107 Top-40 hit songs, making 33 movies, and shook hands with President Richard Nixon (photo at right of meeting 12/21/71) However, Bing Crosby who also died in 1977 recorded 1600 hit songs,

sold 500 million records, made 61 movies, but probably never shook Nixon's hand.

1942 - Armed Forces Radio Service created to distribute programs to soldiers overseas. By January 1946, 1030 vinylite 16-inch transcription discs of 8240 popular and classical songs had been produced as part of the Basic Music Library for the AFRS.

Magnetic Tape Recording Invented

Telegraphone from Magnetic Recording Pictures

1928 - Dr. Fritz Pfleumer patent in Germany for application of magnetic powders to strip of paper or film.

1931 - Pfleumer and AEG begin to construct the first magnetic tape recorders.

1932 - BASF of I.G. Farben joined with AEG of Telefunken to develop magnetic tape recording using Pfleumer patent; by 1934, BASF is able to manufacture reels of plastic-based tape.

Webster wire recorder

1935 - first public demonstration of BASF/AEG "Magnetophone" at Berlin Radio Fair.

1936 - first BASF/AEG tape recording on Nov.19 of live concert by Sir Thomas Beecham.

1939 - independent invention of the wire recorder in U.S. by Marvin Camras at Armour Research Foundation and sold to military during World War II; wire recorders such as the Webster pictured at right were popular with amateurs until the late 1950s.

1940 - David Sarnoff of RCA installed first secret recording devices in the White House for 11 weeks, from June to October, using the same optical Phonofilm method used in RKO films.

1941 - The quality of the Magnetophone in Germany dramatically improved with the use of high frequency biasing developed by Weber and Von Braunmuhl at AEG.

1944 - 3M Co. (Minnesota Mining and Manufacturing) began tape coating experiments in U.S. under Ralph J. Oace.

Tape Recording Comes to America

1945 - Signal Corps Captain John Mullin found Magnetophones at Radio Frankfurt in Germany and 1000-meter reels of 6.5mm ferric-coated BASF tape with 20-min capacity; he mailed 2 machines to U.S. with 50 reels of tape, and after the war worked on them to improve the electronics.

1946 - Mullin demonstrated Magnetophones at San Francisco Institute of Radio Engineers on May 16, and Harold Lindsay told Ampex boss Alexander M. Poniatoff who began work on developing a U.S.-made magnetic tape recorder.

1947 - Mullin demonstrated Magnetophones to Bing Crosby Enterprises in June. NBC had refused to record his show, Bing moved to ABC with Philco sponsor in the fall, brought with him Mullin's Magnetophones to tape his new season shows and dub to 16-inch transcription disc for broadcast starting Oct. 1 - see Der Bingle Technology article on Bing Crosby.

Crosby with early Ampex home model ca. 1948, from Ampex Corp.

1948 - 1st U.S.-made Ampex Model 200 tape recorders arrived for Crosby show #27 along with 3M Scotch 111 gamma ferric oxide coated acetate tape.

War of the Speeds

one of the first RCA 45 rpm players, from the Smithsonian

1948 - Columbia introduced on June 21 the first 12-inch 33-1/3 rpm micro-groove LP vinylite record with 23-minute per side capacity, developed by Peter Goldmark in 1947, using players made by Philco.

1949 - RCA Victor introduced 7-inch 45 rpm micro-groove "Extended Play" vinylite record and player; article from *RCA Review*,later records made of polystyrene. In September, Capitol became the first major label to support all three recording speeds of 78, 45, 33-1/3 rpm.

Capitol Tower

1951 - war of the speeds ended as Victor sold LPs and Columbia sold 45s.

Rock and Roll

1947 - Big 6 record companies controlled majority industry: Columbia, Victor, Decca, Capitol, MGM, Mercury; but teenagers rejected majority music style, giving opportunity to the rise of new small independent labels.

Rock-Ola 120-selection coin wall box found in taverns and diners

1947 - Roy Brown recorded one of the earliest "rock and roll" songs *Good Rocking Tonight* on DeLuxe label, although the name was common in early blues recordings such as Trixie Smith's 1922 *My Man Rocks Me With One Steady Roll*.

Rocket 88 label from World's Rarest Records

1949 - Todd Storz of Omaha's KOWH created Top 40 after observing customers in a bar play the same juke box selection over and over.

1950 - Muddy Waters recorded *Rollin' Stone* for the Aristocrat label of Leonard and Phil Chess on Maxwell Street in Chicago, at the end of Highway 61, "the road to freedom" followed by many black blues singers from the Miss. Delta to Chicago. Waters electrified the blues and helped create rock and roll.

1951- Sam Phillips in his studio in Memphis used his Ampex 350 tape machine to record *Rocket 88,* written by Ike Turner, sung by Jackie Brenston, and sold to Leonard and Phil Chess in Chicago who released it as the 78 rpm Chess record #1458. The sale of this master tape allowed Phillips to start his own Sun Records label.

1952 - Alan Freed started *Moondog's Rock and Roll Party* in Cleveland after

visit to Leo Mintz's record store.


Elvis statue on Beale Street in Memphis

1953 - Elvis Presley in the summer made his first recording (a personal disc for himself, not for his mother's birthday that was in the spring) at the Sun studio of Sam Phillips in Memphis; the second recording by Elvis at Sun was *That's All Right* released July 19, 1954, taped on the two Ampex 350 recorders Phillips used to create the "slapback" audio delay that became a trademark sound of Sun records.

1954 - Bill Haley recorded rhythmic *Shake, Rattle and Roll* and *Rock Around the Clock* on Decca, due to the success in 1953 of his first national rock hit *Crazy Man Crazy* on Essex label.


Soundmirror tape recorder by the Brush Development Co.

1955 - Sam Phillips on Nov. 10 sold his recording contract with Elvis to RCA and Colonel Tom Parker for $35,000.

1956 - Elvis Presley recorded *Heartbreak Hotel* on January 10 in Nashville at his first session for RCA in the RCA Studio on 1525 McGavock Street, and *A Big Hunk o' Love* June 10, 1958, in the new Studio B on Music Row. According to the Elvis Presley Studio Recordings RCA erased most of its tapes from the 1950s for later reuse, but a good transfer of the original, spliced *A Big Hunk o' Love* master can be found on the CD "All Time Greatest Hits", PD90100(2)

From Stereo to Cassette

1945 - Paul Klipsch patented the Klipschorn folded horn speaker. The innovations in speakers and amplifiers and tape recorders after World War II contributed to the birth of a"Hi Fi" era that produced stereo and transistor radios and cassette tape players.

1949 - Magnecord added a 2nd head to its PT-6 tape recorder (the mono model was first introduced at the May 1948 NAB show) to create one of the first open reel stereo tape recorders; see tape recorder ads. Willi Studer in Herisau, Switzerland, made his first Dynavox tape recorder that evolved into the Revox A36 by 1953, and after moving to a new factory in Regensdorf near Zurich in 1960, began to produce the 2 and 4-track Revox D36.

1949 - Frank H. McIntosh and Gordon J. Gow sold the first McIntosh 50W1 Unity Coupled Amplifier, producing 50 watts at less than 1% distortion from 20 Hz to 20,000Hz.

1951 - Stefan Kudelski in Switzerland built the first Nagra portable, self-contained tape recorder with wind-up motor, and Max Grundig in Germany introduced the Reporter tape recorder.

1954 - Acoustic Research introduced the small AR-1 bookshelf loudspeaker that used the acoustic suspension principle developed by company co-founders Edgar Villchur and Henry Kloss. This was soon followed by the $89 AR-2 and by the AR-3 with improved domed tweeters in 1958.

1954 - RCA Victor sold the first prerecorded open reel stereo tapes for $12.95.

1954 - Regency TR-1, first transistor portable radio introduced by I.D.E.A. Co. of Indianapolis - see

note on the question of who made the first such radio.


Chrysler Imperial 1956, from the Imperial Home Page)

1956 - The Chrysler Imperial 16-2/3 rpm record player with 7-inch ultramicrogroove records developed by Peter Goldmark.

1957 - May 28 the National Academy of Recording Arts & Sciences was founded in Hollywood by Paul Weston of Columbia, Lloyd Dunn of Capitol, Sonny Burke of Decca, Jesse Kaye of MGM and Henri Rene and Dennis Farnon of RCA Victor, with Jim Conkling of Columbia as its first president, and began to grant the annual Grammy Awards in 1959 for the best recordings and performers of 1958. Tom Stockham received the first Technical Grammy Award in 1994.

1958 - world standard for stereo records established, and first stereo LPs sold; new generation of Hi-Fi components adopt stereo. Koss introduced stereo headphones.

1959 - Seeburg sold the "Background Music System" with 16-2/3 rpm records.


stereo 'phones 1958, from Koss Museum

1962 - Henry Kloss introduced the KLH Model 11 portable stereo, the first transistorized record player, with the changer/amplifier and two speakers folding into a three-piece suitcase. Kloss had left his previous partner Edgar Villchur at Acoustic Research and founded KLH in 1957 with Malcolm Low and J. Anton Hofmann.

1963 - Philips demonstrated its first compact audio cassette using high-quality BASF polyester 1/8-inch tape that ran at 1-7/8 ips; sold the next year in the U.S. with the Norelco Carry-Corder dictation machine, but the demand for blank tape used for personal music recording was unanticipated by Philips.

1966 - U.S. cars equipped with 8-track stereo cartridge tape players developed by William Lear (who founded the Learjet aviation company in 1962), Ampex, and RCA.

1969 - Dolby Noise Reduction introduced for pre-recorded tapes.

Video Tape Recording

1950 - "Jack Mullin, then Bing Crosby's recordist and chief engineer, began working at the newly established electronics division of Crosby Enterprises to develop a magnetic TV recorder" - from Tape Recorder History by Jerry Whitaker.


first Ampex video tape recorder, 1956, from History of Television

1951 - Ampex team led by Charles Ginsburg began work on a video tape recorder (VTR) in October; Bing Crosby Enterprises demonstrated an experimental 12-head VTR at 100 ips.

1953 - Vladimir K. Zworykin and RCA Labs demonstrated Dec. 1 a longitudinal VTR running very fast at 360 ips over 3 heads with AM sound.

1956 - Ampex demonstrated first practical quadraplex VTR at Chicago NAB show April 14, using 2-inch wide 3M tape at 15 ips over rotating head assembly recording at a slant on tape surface with AM sound; over next 4 years sold 600 units at $75,000 each, mostly to big network stations.

1956 - CBS broadcast the first network television show with videotape Nov. 30, *Douglas Edwards and the News*, for West Coast delayed broadcast.

1957 - Ampex and RCA pooled patents to develop compatible color and B&W VTR.

1959 - first mobile Ampex VTR unit.

Japanese Introduce Helical Scan

1959 - Toshiba in September demonstrated prototype helical scan model VTR-1, with 2-inch tape running at 15 ips over just one head. After the demonstration, Sony began to develop the helical scan VTR.

1960 - Ampex shared VTR patents with Sony and Sony shared transistorized circuitry with Ampex.

1961 - JVC (founded as the American-owned Victor Co. of Japan in 1946, but owned by Matsushita since 1953) demonstrated helical scan color VTR with 2 heads.

1961 - Sony marketed helical scan VTR, the PV100, adopted by American Airlines in 1964 for in-flight movies; Ampex sued Sony in 1966.

1963 - Sony marketed first home VTR for $995, open reel 1/2-inch helical scan deck.

1964 - Ampex joined with Toshiba to market U.S.-designed VTRs in Japan.

Philips cassette

1965 - Sony introduced first consumer 1/2-inch format helical scan VTR and priced under $3000. Philips introduced the compact cassette for consumer audio recording and playback on small portable machines such as the Norelco Carry-Corder 150.

1967 - In March, the Ampex HS-100 color video magnetic disc recorder is used for rapid playback in normal, slow, or stop action, at the ABC "World Series of Skiing" in Vail, Colorado, marking the beginning of "instant replay" on commercial television.

1968 - CBS introduced EVR using film in a cassette; 20th Century Fox agreed to sell movies in EVR; but the format faced growing competition by 1972 from videocassette formats introduced by RCA, Sony, Ampex and Avco, all seeking to develop a new consumer market for home VCRs.

1969 - RCA demonstrated SelectaVision that played pre-recorded cassettes but did not record.

1969 - Sony introduced first videocassette, the 3/4-inch U-Matic one-hour tape, available in U.S. by 1971. For the first time, Sony allowed other manufacturers to sell machines that could play the cassette, and thus succeeded in establishing a world standard for the 3/4-inch videocassette.

1970 - Ampex introduced the Instavision that it had developed with Toshiba; N.V. Philips introduced its own videocassette recorder (VCR) format in Europe; AVCO introduced a solid state compact Cartrivision VCR.

1972 - Phillips demonstrated a laserdisc playback-only deck.

1972 - Sears and Wards sold CartriVision, but too many competing VCR formats caused all to fail by 1973.

Betamax Battles

1975 - Sony introduced in November in the U.S. the Betamax consumer VCR (console only) for $2295 with one-hour 1/2-inch tape cassettes for $15.95. Sony sought to created a standardized format, as it had done with the U-matic in 1969, by getting 7 other companies to agree to produce machines that would play the Beta cassettes.

1976 - JVC introduced in October in Japan the VHS format VCR for $885.

1976 - Sony introduced a Betamax VCR deck for $1300 and began aggressive advertising claiming that it "can actually videotape something off one channel while you're watching another channel" and "build a library of your favorite shows." MCA/Universal and Disney filed lawsuit finally won by Sony in 1984.

1977 - RCA announced in March it would sell VHS with 4-hour tapes.

1978 - Pioneer developed the LaserDisc that was first used by General Motors to train Cadillac salesmen. Pioneer began selling home LaserDisc players in 1980.

1979 - Sony introduced Betascan in April that allowed visible picture while fast-forwarding.


Sony Walkman

1979 - Sony introduced the TPS-L2 Walkman portable audio cassette player, inaugurating a new era of personal music listening; the Sony family of portable personal music players would grow to include over 500 models, from the original pocket-sized 14-oz Walkman to the D-88 Pocket DiscMan of 1988 to the DAT Walkman TCD-D3 of 1991 to the MiniDisc of 1992 to the digital Discman of 1999. According to Sony's press release, in the 20-year history of the Walkman devices, 100 million units were sold in the U.S. creating a $1 billion industry. By 1983, more pre-recorded audio cassettes (236 million) were sold than LPs, a decline in the big vinyl discs that was accelerated in the 1980s by the compact disc digital revolution.

1980 - Sony introduced first consumer video camcorder.

1983 - Sony introduced the Beta HiFi VCR with high-quality FM sound.

1985 - Sony introduced the 8-mm format in April; the VHS group, led by JVC, brought out a compact version of VHS, known as VHS-C, but it only recorded for 20 minutes.

1988 - Super-VHS video format equalled 8-mm in picture quality but not in sound quality.

1989 - Sony introduced the Hi8 video format and the Sony CCD-V99 camcorder.

Digital Revolution - see topics


Sony's first CD player

1982 - first digital audio 5-inch CD discs marketed, merging the consumer music industry with the computer revolution

1985 - Sony and Philips produced the standard for Compact Disc Read Only Memory (CD-ROM) computer discs that would use the same laser technology as the audio CD.

1987 - Digital Audio Tape (DAT) players introduced

1988 - for the first time, CD sales surpassed LP sales, leaving CD and cassette as the two dominant consumer formats; more than 1/2 of TV households own a VCR; the first transatlantic fiber-optic cable carried up to 37,000 telephone transmissions and began to replace satellites for telephone communication.

1990 - Canada began digital radio that used the L-band.

1993 - Digital HDTV Grand Alliance in October selected Dolby AC-3 to provide digital surround sound for the emerging technology of digital television.

1994 - Global Big 6 control $30 billion record industry: Philips (owns Polygram, A&M, Mercury, Island), Sony (owns CBS Records), Matsushita (owns MCA, Geffen), Thorn-EMI (owns Capitol, Virgin), Time Warner, and Bertelsmann (owns RCA Records)

1995 - By September, all companies in the DVD consortium agreed to DVD standards.

1996 - DVD players started selling in Japan, and began in 1997 selling in the U.S.

1997 - San Diego's MP3.com was founded in November by Michael Robertson; Another digital pioneer company was founded in San Diego in August 1998, Packetvideo, that became a leader in cell phone mobilemedia.

1998 - Jonell Polansky produced the first 24-bit 48-track digital recording session at Ocean Way on Nashville's Music Row

1998 - Aug. 6 the first HDTV set went on sale for $5,499 to the public in San Diego, a 56-inch Panasonic set that was developed at the company's research and development center in San Diego and manufactured in Tijuana.

1998 - *The Last Broadcast* premiered Oct. 19 as "the first desktop feature film" produced and exhibited digitally, co-sponsored by Texas Instruments using its DLP digital cinema projector.

1999 - TiVo and Philips announced March 31 in a press release shipments of "the first personal TV system." The 5 largest record companies in the U.S. controlled 84% of the 755 million albums sold in

the U.S. in 1999: 26.3% by Seagram's Universal (owns MCA, Polygram), 16.2% by Sony Music (owns Columbia), 16% by Bertelsmann's BMG (owns RCA Victor), 15.7% by Time Warner's Warner Music, 9.4% by EMI.


Apple's iPod

2000 - Disney released on Jan. 1 Fantasia/2000 in the IMAX film format with 6-channel digital sound.

2001 - Apple Computer introduced on Oct. 23 the iPod portable music player.

2002 - Annual world production of DVD-Video discs surpassed VHS cassettes, according to IRMA industry statistics: DVD increased from 1.08 billion in 2001 to 1.74 billion in 2002; VHS declined from 1.533 billion in 2001 to 1.33 billion in 2002.

2003 - DVD-Video rentals increased 51.2% and VHS rentals dropped 29% from the previous year; DVD-Video sales increased 42.2% to $12.1 billion and VHS sales dropped 34.8% to $2.4 billion, according to Video Store Magazine.

2004 - The first HD car radio was sold Jan. 5 in Cedar Rapids, Iowa, according to the iBiquity Digital Corp. press release, "the biggest revolution in radio since the advent of FM broadcasting more than fifty years ago."

2005 - Apple introduced on Jan. 11 the iPod Shuffle solid-state music player.

Sources and Suggested Readings

Links

Acknowledgements

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