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Moving Image and Sound

Format Assignment

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16^{2/3} RPM Vinyl Disc

Among the various audio disc formats, perhaps none is less known than the 16^{2/3} rpm disc. Before I begin my investigation of this particular format, it will be helpful to draw a brief history of the audio disc generally, and to lay out the major developments which have characterized its evolution. The principal advancements to this technology involve changes to the disc's size, revolution speed, and width of groove.

The first disc gramophone was patented in 1887 by Emile Berliner.¹ By the early 1900s, Berliner's gramophone was widely replacing Edison's cylinder recordings.² Early Berliner discs spun at approximately 80-rpm, and were standardized to 78 rpm not long after 1912.³ 78-rpm remained the standard until the years following World War II, when increased prosperity and consumer buying power contributed to the development of the high-fidelity or "hi-fi" hobby in the United-States.

In the late 1940s, the Radio Corporation of America (RCA) launched the 45-rpm microgroove single as a high-fidelity alternative to the 78-rpm single.⁴ At the same approximate

¹David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 34.

²David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 40.

³David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 40.

⁴David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 136.

time, Columbia records released its new $33^{1/3}$ long-play (LP) disc, which not only offered improved sound quality, but an extended playing time also. LPs were initially intended for classical music, as classical pieces are rarely short enough to fit on a 45 or 78-rpm single.⁵ The competition between the 45 and 33 formats received attention from the press at the time, and was referred to as the “war of the speeds”. In hindsight, it can be said that only the 78 was a true loser in this battle, with both the 45 and 33 rpm discs each gaining its section of the market: 45 rpm for pop singles, and 33 rpm for classical music and pop “albums” (SR 139). So goes the story of the audio disc format as it is often told in cartoon style.

Often overlooked by history is the ill-fated $16^{2/3}$ rpm disc. Never gaining commercial popularity, this format was used primarily in four different audio systems which include the “Seeburg Background Music System”; Columbia’s “Highway Hi-Fi”, the extra-long-play or “Super LP” album, and the “talking book” format produced and distributed in the United-States by the Library of Congress. I will explore the life-cycle of these four systems, as well as the reasons for their disappearance from mainstream cultural memory.

With 45 and 33-rpm discs having found their respective markets following the “war of the speeds”, 16-rpm discs belonged to niche markets and unusual applications which required either a small disc diameter, a long playing-time, or both. One such application was called “Highway Hi-Fi” by its inventor, Peter Goldmark of CBS. Goldmark credits himself as being the first to envision and successfully install an audio disc turntable for use *in a moving automobile*. In order to fit conveniently inside the vehicle’s glove compartment, it was decided that the disc must not exceed 7 inches in diameter. To fit over 45 minutes of music *per side* (the total approximate runtime of *both sides* of an LP) the turntable speed was reduced to $16^{2/3}$ rpm, and a

⁵David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 137.

greater number of grooves per inch was required. Goldmark and company thus pioneered a slimmer record groove, allowing them to fit three times as many grooves on each side of the disc.⁶ It was known as the “ultra-microgroove”.⁷ Where shellac 78s were typically cut with a 3mil groove size, the modern LP is cut with a 1mil stylus; 16-rpm discs were usually given 0.5 or 0.7mil grooves, and the Highway Hi-Fi discs went even further and reduced the groove to 0.25mil.⁸

The turntable itself was equipped with various springs, masses and other damping materials in an attempt to neutralize mechanical interference by way of a “compensating mechanical motion”.⁹ To help deal with horizontal and vertical vibrations, the tracking force of the tonearm and stylus were set significantly higher than what would normally be seen on a home turntable. The discs had a standard-sized spindle hole, and the stylus moved its way from the center of the disc toward the outer edge. Goldmark and CBS cut a deal with the Chrysler Corporation of America to install the system in that year’s line of Chrysler vehicles, and Goldmark insists that when a prototype Highway Hi-Fi unit was installed for tests, that it performed flawlessly even under the grueling conditions offered by Chrysler’s rough terrain testing lot.

⁶Peter Goldmark, *Maverick Inventor: My Turbulent Years at CBS* (New York: Saturday Review Press, 1973), 149.

⁷Mike Dicecco, A History of 16-RPM Records, Part Two: Audio Books,” capsnews.org, Antique Phonograph News, 2010, <http://www.capsnews.org/apn2010-3.htm>.

⁸Mike Dicecco, A History of 16-RPM Records, Part Two: Audio Books,” capsnews.org, Antique Phonograph News, 2010, <http://www.capsnews.org/apn2010-3.htm>.

⁹Peter Goldmark, *Maverick Inventor: My Turbulent Years at CBS* (New York: Saturday Review Press, 1973), 150.



Fig. 1: Highway Hi-Fi installed (left) and museum piece (right). Source: Google Images.

The technology was made commercially available in 1956, but was less successful than hoped.¹⁰ Few customers chose to purchase the optional feature, and only a limited selection of specialized record sets, sold exclusively by Columbia, could be played on the system. Moreover, the unusually high tracking force, required to prevent skipping and skating, caused the discs to wear out and lose fidelity relatively quickly. Ultimately, Highway Hi-Fi did not catch on among consumers, and the technology was discontinued by the end of the decade.

Another variation of the 16-rpm format was developed for use in the Seeburg 1000 Background Music System. The Seeburg organization was a builder and distributor of various coin-operated vending machines for cigarettes, coffee, cold drinks etc.¹¹ In June of 1959, the company diversified with their introduction of the Seeburg 1000 unit. The 1000 was housed in a stylish red and gold enclosure, mixing well with design tendencies at the time, and played a pre-selected program of 16-rpm background music records, carefully ordered and arranged in a stack.

¹⁰David Morton, *Sound Recording: The Life Story of a Technology* (Westport: Greenwood Press, 2004), 156.

¹¹Nick Biro. "Coin Machines: Seeburg Background Music Move Part of Diversification Pattern," *The Billboard (Archive: 1894-1960)*: 67-67, 72. doi: <http://proxy.library.nyu.edu/login?url=https://search-proquest-com.proxy.library.nyu.edu/docview/1475618333?accountid=12768>.



Fig. 1: Advertisements for Seeburg 1000. Source: seeburg1000.com.

These proprietary discs featured a 2-inch center spindle hole and, like the Highway Hi-Fi discs, were cut with a narrower groove, making it possible to include 45 minutes of music per side. To avoid the need for an operator to interrupt the music in order to flip the stack of records, a specially-designed tonearm was built with a stylus both on top (facing up) and on the bottom (facing down); see Fig. 3. The machine would play first the underside of the disc, then the top. Music programs came in three varieties and were distributed quarterly by the Seeburg company.¹² The selections were curated by tempo, and each program was intended for use in a specific generic setting.

The “basic” selection was marketed primarily to banks, office buildings, and other places of daytime business. A “mood music” selection was offered for use in nightclubs and restaurants. Finally, the “industrial” program was intended for use in factories, its up-tempo rhythms designed to boost worker productivity.¹³ Records were sold in sets of 25, for a total of 1000

¹² “The Seeburg 1000,” Historysdumpster, Blogspot.com, 2012, <http://historysdumpster.blogspot.com/2012/08/the-seeburg-1000.html>.

¹³ R. Granados, “Seeburg ‘1000’ Background Music System,” seeburg1000.com. Seeburg Music Library, 2019, <https://seeburg1000.com/>.

individual tracks totalling $37^{1/2}$ total hours of music.¹⁴ When they were worn-out, or had otherwise exhausted their use for the client, Seeburg records were returned by mail to the company, and destroyed.¹⁵

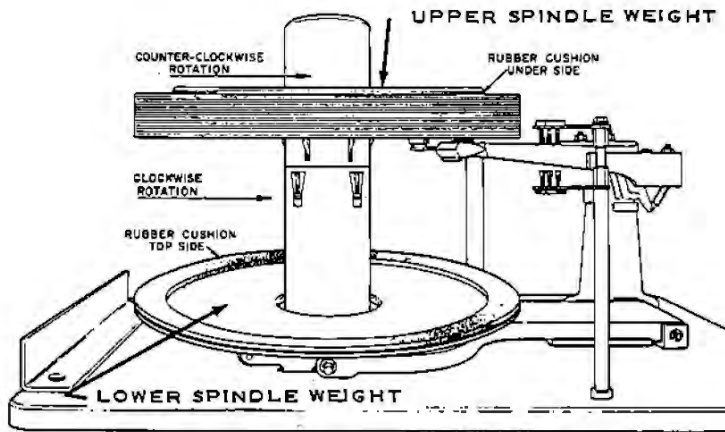


Figure 4. Playing Underside of Record.

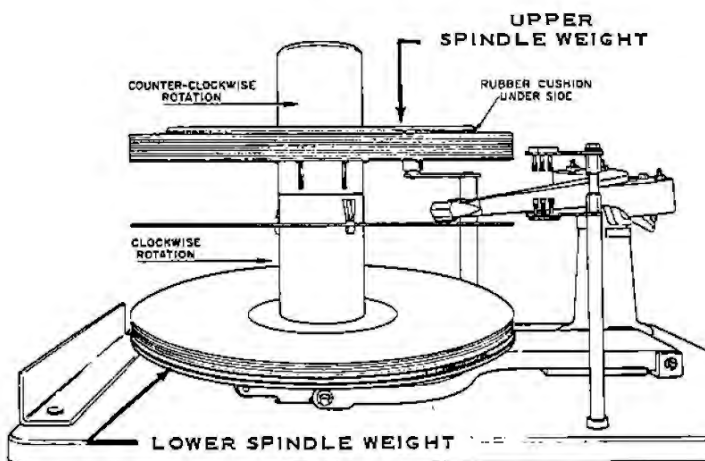


Figure 5. Playing Topside of Record.

Fig. 3: Excerpt from Seeburg 1000 manual, showing two-sided stylus function.

¹⁴ *Installation Manual: Seeburg "1000" Background Music System, Model BMS2* (Chicago: The Seeburg Corporation).

¹⁵ "The Seeburg 1000," *Historysdumpster*, Blogspot.com, 2012, <http://historysdumpster.blogspot.com/2012/08/the-seeburg-1000.html>.

Another use for which the 16-rpm disc, with its extended runtime, was particularly well-suited was to record lengthy sessions of spoken-word material. Unlike music, where a soothing and pleasant listening experience was expected, fidelity was less important in this utilitarian application, as simple clarity was sufficient to transmit verbal information.

In 1935, in the United Kingdom, the Royal National Institute for the Blind recorded, on a 16-rpm shellac disc, *The Murder of Roger Ackroyd* by Agatha Christie, the first known “talking book”.¹⁶ More common in later years was the vinyl version, and popular stories such as *The War of the Worlds* and *Treasure Island* were released as 16-rpm albums. Disc diameter was never standardized for 16-rpm, and the various forms (including proprietary systems) existed in 7, 9, 10, and 12-inch sizes.



Fig. 4: Album covers for “A Talking Book” and “Listening Library” releases. Source: Capsnews.

¹⁶Mike Dicecco, A History of 16-RPM Records, Part Two: Audio Books,” capsnews.org, Antique Phonograph News, 2010, <http://www.capsnews.org/apn2010-3.htm>.

The development of the talking book continued in the United-States in 1958 when the Library of Congress “negotiated contracts to test the feasibility of using recordings at slower speeds”.¹⁷ Two prototype discs were produced that year and, by 1962, the Library began ordering 16-rpm talking books for a juvenile audience. By 1963, 10-inch, 16-rpm discs were the standard Library of Congress talking book format.

While the American Foundation for the Blind had been producing talking book machines for 33-rpm playback since the mid-1930s, it was not until 1957 that a 16-rpm machine was produced in this country. The National Library Service held contracts with various commercial manufacturers to build the units, and notable developments included the Model D (manufactured through 1964) which played both 33 and 16-rpm discs. In 1965, talking book machine model AE-1 was launched with a three-speed motor to accommodate the even slower 8-rpm speed, in addition to the 33 and 16-rpm formats.¹⁸



Fig. 5: Talking Book machine, Model AE-1. Source: YouTube.

¹⁷ “History,” National Library Service for the Blind and Print Disabled, Library of Congress, accessed December 7, 2019, <https://www.loc.gov/nls/about/organization/history/>.

¹⁸ “History,” National Library Service for the Blind and Print Disabled, Library of Congress, accessed December 7, 2019, <https://www.loc.gov/nls/about/organization/history/>.

Model AE-5, released in 1968, was the first to use a lightweight plastic base and include a solid-state transistor amplifier (previous models used vacuum tube systems). This colored plastic design continued through the 1970s, with such models as the A-70 through 73. Beginning with the later models A-77 through 80, further additions included a two-sided needle, (one for 33 and one for 16 and 8-rpm records), an automatic shut-off, guides to help center the record, and a removable lid with built-in speaker.¹⁹



Fig. 6: Talking Book Model A-80. Source: YouTube.

A final excursion into the world of 16-rpm, again by CBS, was the 12-inch “Super LP” format. Here, the “1^{1/2} Hours of Non-Stop Music” was given the marketing fanfare. As such, these records typically featured lengthy compilations of popular dance numbers, and were labeled as “Dance Spectacular” or “Dance Party” albums, presumably because they could deliver uninterrupted programs of predictably enjoyable music to an audience unconcerned with high-

¹⁹“History,” National Library Service for the Blind and Print Disabled, Library of Congress, accessed December 7, 2019, <https://www.loc.gov/nls/about/organization/history/>.

fidelity. Prestige Records released a number of jazz albums by the likes of Miles Davis, Sonny Rollins, and the Modern Jazz Quartet.²⁰ While these latter artists would no doubt have had a devoted following of serious listeners, it is conceivable, also, that their music would be played at gatherings or at public places where cultured ambiance, rather than engaged listening was expected. In these situations, the Super LP would suffice.



Fig. 7: CBS Super LPs and Prestige Records Miles Davis release. Source: 16rpm.com.

Excluding the proprietary Highway Hi-Fi and Seeburg systems, Super LPs and talking books were apparently used widely enough by consumers that some home audio equipment manufacturers took the trouble to include a 16-rpm setting as standard on their turntables for a number of years. Garrard and BSR brand turntables were among those which featured this setting. In the leftmost image of the three images above, is pictured the speed selector on a Garrard turntable.

²⁰ "16 RPM Music Records," 16rpm.com, accessed December 7, 2019, <http://www.16rpm.com/>.



Fig. 8: 1960s turntable with 16-rpm speed setting. Source: 16rpm.com.

Today, the 16-rpm disc exists as a relic, though small groups of enthusiasts exist online and keep the memory of this format alive. Seeburg1000.com, for example, is a website dedicated to the unit of that name, and provides a 24-hour online stream of Seeburg Music Library Content. The company is active, lists an address in Burbank, California, and Seeburg CDs and merchandise are available at their online store. A primitive website dedicated to Highway Hi-Fi can also be found, which offers general information, brochures, lists of vehicles that featured the option, and information on record sets. There is an undeniable emphasis on the “kitsch” aesthetic of these technologies, and the websites, while certainly enthusiastic, can’t help but exhibit a somewhat condescending undertone. Wherever its memory is preserved, the 16-rpm disc, in all its variants, cannot shake its reputation as a somewhat laughable historical oddity

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