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Standard 8mm Film: Single-width and Magnetic Sound

The 8mm film format, soon to be 85 years old, has a varied and interesting history. Of this complicated history, this paper focuses mainly on two lesser known aspects of the format: single-width 8mm film (and its associated film stocks and cameras), and 8mm film sound. A brief history of early amateur film formats leading up to 8mm film, an overview of some of the main user groups of the format, and a summary of the format's decline in usage and discontinuation are also included.

I. Sub-35mm Amateur Formats up to 8mm

Ever since the invention and standardization of 35mm film for motion pictures in the late 19th century, people have sought to modify it for various reasons: to cut cost, increase equipment mobility, provide access to amateurs. One of the earliest modification attempts was the production of the 17.5mm Birtac film made in the United Kingdom in 1898 by slitting 35mm nitrate film in half and using it in a combined camera and projector.¹ From the introduction of the Birtac in 1898 to Kodak's unveiling of the 16mm film format in 1923, at least 41 other systems were developed for amateur use.² In 1912, the French corporation, Pathé, introduced the first non-flammable acetate safety film for amateur use with its 28mm film gauge.³ 28mm film soon gave way to the first amateur film format to find wide acceptance in Europe: Pathé's 9.5mm

¹ Kattelle, Alan D. *Home Movies: A History of the American Industry, 1897-1979*. Transition Publishing, 2000. p. 53.

² Enticknap, Leo. *Moving Image Technology: From Zoetrope to Digital*. Wallflower Press, 2005. p. 66.

³ Enticknap. *Moving Image Technology*. p. 66.

gauge, sold as a camera, projector, and film stock combination package starting in 1922.⁴ Pathé also reduction-printed segments of 35mm commercial films to the 9.5mm format for consumers to rent and watch at home.⁵ In 1923 Kodak introduced 16mm reversal safety film, a format that gained such wide acceptance that it eventually overtook the market from all amateur gauges that had come before.⁶ The ingenuity behind all of these early amateur formats—from the development of safety film, to the discovery of the reversal process, to the bifurcating of a larger gauge—set the stage for the creation of standard 8mm film.

Because 16mm film is quite literally the building block of 8mm film, the real history of the 8mm format begins with the invention of 16mm film. 16mm became possible in the late 1910s due to Kodak's development of a film stock that was both safe for home-use and could be processed without the cumbersome and costly negative-to-positive processing step.⁷ Although marketing the new sub-35mm safety reversal format in the 17.5mm gauge would have been more cost-effective, Kodak decided against it for fear of people splitting flammable 35mm nitrate film in half and using it instead of Kodak's safety film.⁸ Instead, Kodak opted for the slightly smaller 16mm gauge and introduced the format as a package that included the Cine-Kodak camera, the Kodascope projector, a tripod, and a screen.⁹ The complete 16mm package cost \$335 which was incredibly expensive for the time and limited its use to groups with a higher socio-economic status.¹⁰

⁴ Kattelle. *Home Movies*. pp. 68-69.

⁵ Nyström, Jan-Eric. "History of Sub-35mm Film." *Ani-Mato: Spare Time Labs*, www.sparetimelabs.com/animato/animato/.

⁶ *The Film Preservation Guide: The Basics for Archives, Libraries, and Museums*. National Film Preservation Foundation, 2004. p. 8.

⁷ Enticknap. *Moving Image Technology*. p. 67.

⁸ Enticknap. *Moving Image Technology*. P. 67.

⁹ Kattelle. *Home Movies*. p. 94.

¹⁰ Kattelle. *Home Movies*. p. 94.

Less than a decade after the introduction of 16mm film, the development of faster emulsion speeds and finer-grain film stock led Kodak to consider the creation of an even smaller-gauge film that could provide consumers with a cheaper alternative while maintaining an acceptable resolution.¹¹ In order to save money on the upfront cost of producing a completely new gauge, Kodak decided to bifurcate the already existing 16mm film, allowing them to utilize much of the machinery already in place.¹² Standard 8mm film was introduced in 1932 and offered as a less expensive and more user-friendly alternative to 16mm film.¹³ The first 8mm camera Kodak camera, the Cine-Kodak 8 Model 20, sold for only \$29.50, almost a quarter of the cost of their Cine-Kodak 16mm camera.¹⁴ Other corporations around the world, including Bolex, Universal Camera Company, Keystone, Agfa, Gevaert, and Bell & Howell, soon followed with their own cameras, projectors, and film stock for the newly born 8mm format.

Standard 8mm film yielded about 80 frames of image per foot of film and only 135 feet of film was required to shoot ten minutes on the format.¹⁵ 8mm also maintained the 4:3 aspect ratio of 16mm film, making reduction-printing of commercial 16mm films onto standard 8mm film relatively easy.¹⁶ Standard 8mm film has a frame size of 4.88mm by 3.68mm which is a quarter of the 16mm frame size, and a pitch of 3.81mm, exactly half of that of 16mm film. 8mm film was generally shot and projected at 16fps although modifications were made in the 1960s in order for the format to work better with sound.¹⁷

¹¹ Kattelle. *Home Movies*. p. 95.

¹² Zimmermann, Patricia R. *Reel Families: A Social History of Amateur Films*. Indiana University Press, 1995. p. 63.

¹³ Repinski, Cynthia A. *The UniveX Story: Universal Camera Corporation*. Centennial Photo Service, 1991. p. 35.

¹⁴ Kattelle. *Home Movies*. p. 96.

¹⁵ Ascher, Steven, and Edward Pincus. *The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age*. Revised ed., Plume, 1999. Appendix E.

¹⁶ Ascher. *The Filmmaker's Handbook*. p. 7

¹⁷ Thompson, Lloyd. "Problems in the Design of an 8mm Magnetic Sound-on-Film Projector." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 581-585. *IEEE Xplore*. p. 581.

Initially, the film that consumers bought and ran through 8mm cameras was 16mm-wide but with double the number of perforations on each side compared to film used in 16mm cameras.¹⁸ When ran through the camera, only half of the film's width was exposed at first, yielding 8mm-wide images. Once the end of a spool was reached, the operator opened the camera and flipped the spool to shoot the other half of the roll of film. The then fully exposed film was mailed to Kodak where it was developed and split down the middle to yield two strips of 8mm-wide film. These were subsequently spliced together in the order that they were exposed.¹⁹ In the end, a 25ft roll of 16mm-wide film yielded 50 feet of projectable 8mm film. This type of film was referred to as double-width 8mm or double-8 film and remained the most widely marketed and used kind of standard 8mm film. However, cameras designed specifically for single-strand, pre-split 8mm film entered the market soon after the introduction of double-8 film, with several European and American companies making films and cameras especially for this type film.

II. Single-width 8mm Film Stocks and Cameras

Single-width 8mm film soon acquired many names as different manufacturers and regions across the globe began producing and selling this new type of film. These included straight-8, 1x-8mm, or single-8 film depending on by what company or in what region the film was manufactured and sold. In Europe, the format became widely known as single-8, as summarized below in a section on Agfa's single-width 8mm cameras. This is not to be confused with the Single-8 format created by Fuji in the 1960s as a competitor to Kodak's super 8mm

¹⁸ Kodak. "Super 8 mm Film History." motion.kodak.com/US/en/motion/Products/Production/Spotlight_on_Super_8/Super_8mm_History/default.htm.

¹⁹ *The Film Preservation Guide*. p. 7.

format. In the United States, pre-slit standard 8mm film was more commonly referred to as straight-8 film, as will be discussed in a section to follow on Bell & Howell's first 8mm camera.

An important part of any film format's history is the development of the technology necessary for its recording and playback. This is especially true in a study of single-width 8mm film, where its only real difference with double-8 film lays in the cameras that are used to expose it. Agfa's Movex 8 in Germany and Bell & Howell's Filmo Straight Eight in the United States were some of first cameras that utilized single-width 8mm film.

Bell & Howell, one of Kodak's main competitors in the camera manufacturing business, had inaugurated its line of now-renowned amateur Filmo cameras in 1923 with the release of the 16mm Filmo 70.²⁰ By introducing their first 8mm Filmo camera in mid-1935, the 127-A Straight 8, Bell & Howell became the first company to manufacture a camera designed to use pre-slit 8mm film specifically.²¹ The film for the 127-A Straight 8 cameras was still purchased by Bell & Howell from Kodak in the form of double-8 stock, but the double-8 rolls were subsequently split in half and wound on special 30ft spools to create straight-8 film compatible with the cameras.²² Bell & Howell's decision to depart from Kodak's double-8 film, used in most standard 8mm film cameras of the time, in favor of single-width 8mm film did not serve them well in the end as the 127-A did not succeed in the market at large.²³ This was partly due to the fact that the \$69 camera cost more than twice as much as Kodak's double-8 Model 20 camera, and partly due to the Filmo's incompatibility with the more popular double-8 film rolls sold directly by Kodak.²⁴

²⁰ Zimmerman. *Reel Families*. p. 29

²¹ Kattelle. *Home Movies*. p. 96.

²² Kattelle. *Home Movies*. p. 97.

²³ Kattelle. *Home Movies*. p. 96.

²⁴ Kattelle. *Home Movies*. p. 96.

In December 1935, not a year after its initial release, the 127-A was modified to take double-8mm film and rebranded as the Filmo 134-A.²⁵

Another company that manufactured cameras for the single-width 8mm film sub-format was the New York-based Universal Camera Corporation.²⁶ They released the UniveX A-8 in September 1936, and kept the line in production with the B-8 and C-8 models until 1946, making the UniveX series the longest continually-manufactured cameras that shot straight-8 film.²⁷ The UniveX A-8 was deliberately designed to be so inexpensive as to be affordable for people in lower socio-economic strata in order to expand the public's acceptance of amateur motion-picture film cameras.²⁸ When the initial design for the UniveX A-8 commenced, the target price for the camera was \$10; indeed when the camera was released it cost a mere \$9.95.²⁹ According to *The UniveX Story*, Cynthia Repinski's exhaustive account of the Universal Camera Corporation, "Universal decided to design a movie camera that required a non-standard size film on a special patented film spool incompatible for use in any other manufacturer's cameras."³⁰ This was a scheme intended to generate profit through film stock sales so the company could offer their cameras and projectors at lower prices.³¹ The Belgian Gevaert film manufacturing company was contracted to make two different stocks of special single-8 film for the UniveX camera: the UniveX #100-S Standard and UniveX #100-UP Ultrapan.³² A reel of straight-8 UniveX film from the film *Univex Hunters*, with samples of both kinds of the aforementioned

²⁵ Zimmerman. *Reel Families*. p. 63.

²⁶ Repinski. *The UniveX Story*. p. 41.

²⁷ Kattelle. *Home Movies*. p. 97.

²⁸ Repinski. *The UniveX Story*. p. 35.

²⁹ "UniveX Advertisement". *The Hartford Daily Courant*, 23 May 1937, p. 7. *Newspapers.com*.

³⁰ Repinski. *The UniveX Story*. p. 41.

³¹ Kattelle. *Home Movies*. p. 166.

³² Repinski. *The UniveX Story*. p. 41.

film stocks can be seen in Figure 1. This reel was borrowed for this project from Dino Everett, archivist at University of Southern California's Hugh Hefner Film Archive.

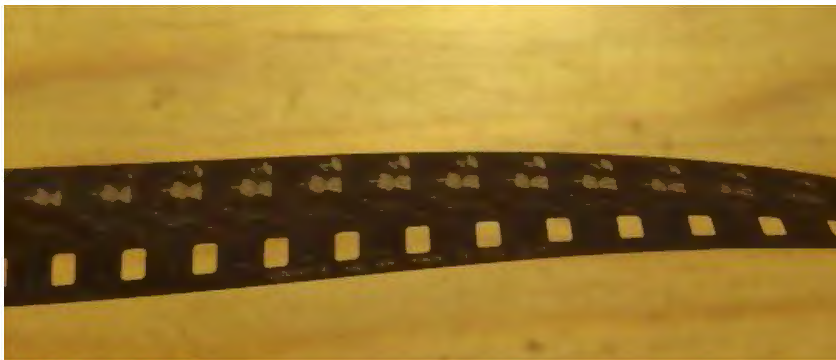


Figure 1. Univex Ultra Pan film stock from the USC Hugh Hefner Film Archive

The Movex 8 was another early single-8-compatible camera that was introduced in 1937 by the German company Agfa. This camera was designed to use Agfa's unique Movex-Filmkassette which held 30ft of film in a special cartridge.³³ These film cassettes were available with both black and white film and Agfacolor film, Agfa's own color film stock which was the main rival to Kodak's dominance of the color film market at the time.³⁴

One reason for designing cameras to use pre-slit 8mm film instead of double-8 film was the smaller cameras required to shoot pre-slit film. The smallest camera that used straight-8 film was the remarkably compact Bolsey 8. The Bolsey 8 was indeed the smallest motion picture camera in the world at the time of its introduction in 1956, as well as being the only commercially manufactured camera to function both as a still and motion-picture camera at the

³³ Trickett, Mike. "8mm Film Formats." *Reel Deals*, 2009. reeldeals.com.au/8mm/8mm.htm.

³⁴ Trickett. "8mm Film Formats."

time.³⁵ The Bolsey 8 was designed to use 25ft of Kodachrome Daylight or Type A straight-8 film housed in special factory-loaded magazines which shot about 2 minutes of film.³⁶

Some cameras were manufactured to be compatible with both double-8 and single-8 rolls of film. One such camera was the Keystone Model K-8 introduced by the Keystone Manufacturing Company in late 1935 and capable of using both Agfa's single-width economy spool and double-8 black and white or Kodachrome film from Kodak.³⁷ A news article from the April 1937 issue of *Movie Makers* magazine claims that in the K-8 camera "the gate is so constructed that either double or single 8 film will run correctly in the focal plane."³⁸ The piece also reveals that 30ft daylight spools of single 8mm reversal film were sold for \$1.45 at the time.³⁹

Despite the failure of most single-width standard 8mm film and cameras, standard 8mm film in the double-8 guise was a successful amateur film format overall. So much so that after 15 years from its introduction in 1932 it had almost completely replaced 16mm as an amateur home-movie format, which at that point was used almost exclusively in more professional arenas such as educational films and television production.⁴⁰ The standard 8mm film format, with its small, inexpensive, and portable equipment, remained the main mode of home-movie creation for much of the 1940s, 1950s, and well into the 1960s, until the advent of the super 8mm film format in 1965.⁴¹

³⁵ Kattelle. *Home Movies*. p. 162.

³⁶ Kattelle. *Home Movies*. p. 162.

³⁷ Kattelle. *Home Movies*. p. 155.

³⁸ Holslag, Russell C. "News from the Industry." *Movie Maker*, vol. 12, no. 4, Apr. 1937, p. 177. *Lantern*.

³⁹ Holslag. "News from the Industry." p. 177.

⁴⁰ Kodak. "Super 8 mm Film History." *Internet Archive: Wayback Machine*, [web.archive.org/web/20071112095846/http://www.kodak.com/US/en/motion/s8mm/history.jhtml](http://www.kodak.com/US/en/motion/s8mm/history.jhtml).

⁴¹ Kodak. "Super 8 mm Film History." *Internet Archive*.

III. 8mm and Sound

The first successful attempt at marrying standard 8mm film with sound was a sound-on-disk projector called the Movie-Sound-8 that was invented by innovator Lloyd Thompson and sold in a limited run in 1947.⁴² The Movie-Sound-8 was patterned after the theatrical Vitaphone sound process, with a turntable playing a the sound disc while the corresponding images were displayed by a projector.⁴³ According to Alan D. Kattelle's authoritative history of amateur film formats, "in 1946, the Calvin Corporation, under the direction of Lloyd Thompson, secured an arrangement with Castle Films, a well-known distributor of professional films for the amateur market, to supply Calvin with suitable films with sound accompaniment."⁴⁴ Since the Movie-Sound-8 operated at 16fps and the commercial Castle films were 24fps sound films, Thompson also invented a printer that skipped every third frame of the 16mm Castle films during the reduction-printing process so that the 24fps 16mm sound films were printed as 16fps 8mm films.⁴⁵ The sound was recorded separately on a disc and played back at 33 1/3 rpm and although discerning viewers noticed a slight disparity between sound and image, the reels were short enough that most audiences did not notice.⁴⁶

While Thompson's 1947 sound-on-disc 8mm projector was functional, when magnetic striping became possible in 1948, an even better method of 8mm sound reproduction was on the horizon.⁴⁷ Magnetic striping offered the possibility of eliminating the cumbersome use of the disc as well as better synchronization of sound with the film's images. The first magnetic sound-on-film 8mm projector went on sale in 1953, was also invented by Thompson, and also,

⁴² Kattelle. *Home Movies*. p. 229

⁴³ Hedden, W.D. and K. B. Curtis. "Early 8mm Sound Developments." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 585-588. *IEEE Xplore*. p. 585.

⁴⁴ Kattelle. *Home Movies*. p. 229.

⁴⁵ Hedden. "Early 8mm Sound Developments." p. 586

⁴⁶ Hedden. "Early 8mm Sound Developments." p. 586

⁴⁷ Hedden. "Early 8mm Sound Developments." p. 586

confusingly, called the Movie-Sound-8.⁴⁸ While Thompson was able to overcome the main obstacles facing magnetic sound on 8mm film (the small area available for the stripe and the standard 16fps 8mm projection speed being too slow for optimal sound reproduction by magnetic heads), his second Movie-Sound-Eight did not find a market due to its high price and in the end only 1200 units were made.⁴⁹

Due to the continuing improvements in magnetic sound recording techniques throughout the 1950s, the breakthrough for 8mm sound-on-film occurred in 1959, and by 1960 projectors by brands such as Cirse, Elite, Fairchild, Fujica entered the market.⁵⁰ Magnetic striping of 8mm film was achieved by placing a thin, 0.0025-inch-wide magnetic stripe on the outside of the sprocket holes on the margin of the film (in super 8mm the stripe was placed on the edge opposite the sprocket holes).⁵¹ 56 frames separated the sound and the image for regular 8mm film that used a magnetic stripe soundtrack.⁵² After several European companies had already manufactured projectors for 8mm magnetic sound film in 1960, Kodak entered the market with the Kodak Sound 8 projector, widely considered one of the best 8mm sound projector of its time.⁵³ Despite the technology becoming available, the sale of 8mm sound film projectors was not widespread at the time due to a lack of commercial theatrical release prints in the standard 8mm format that incorporated magnetic stripe soundtracks.⁵⁴

Discussed at length in the August 1961 issue of the *Journal of the SMPTE*, the use of optical soundtracks for standard 8mm film was also considered before magnetic sound was

⁴⁸ Hedden. "Early 8mm Sound Developments." p. 586

⁴⁹ Kattelle. *Home Movies*. p. 263.

⁵⁰ Flory, John. "The Challenge of 8mm Sound Film." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 581-585. *IEEE Xplore*. p. 581.

⁵¹ Thompson, Lloyd. "Problems in the Design of an 8mm Magnetic Sound-on-Film Projector." p. 588.

⁵² *The Film Preservation Guide*. p. 13.

⁵³ Kattelle. *Home Movies*. p. 235.

⁵⁴ Flory. "The Challenge of 8mm Sound Film." p. 583.

decided upon. Despite the fact that optical soundtracks would have cost less, and eliminated the risk of accidental erasure that is present with magnetic sound, the latter was considered the better option in the end because of the convenience of recording sound directly onto film without any need for additional processing or development.⁵⁵

While 8mm sound projectors, whether using a disc or magnetic striping, had provided the ability to view pre-stripped commercial prints or record sound directly on home movies since 1947, the first 8mm sound cameras, which gave consumers the ability to record sound live directly onto film, did not appear on the market until 1960.⁵⁶ The first 8mm sound camera to enter the market was the Fairchild Cinephonic 8, introduced in late 1960 and capable of recording magnetic sound directly onto film using a magnetic sound head. However, at \$249, the camera was incredibly expensive for the time and not affordable for the vast majority of home-movie-makers.⁵⁷ The accompanying projector, a Fairchild Cinephonic 8mm sound projector, was released at the same time and had the ability to play standard 8mm film at both 16fps and 24fps.⁵⁸ The camera/film/projector package was available with both color and black and white pre-stripped film.⁵⁹

Later, in 1969 Kodak started offering to place unrecorded magnetic stripe on standard 8mm film which could then be recorded on using a microphone as the film ran through the projector.⁶⁰ After the emergence of super 8mm magnetic sound film in the early 1970s, some companies manufactured projectors that were compatible with both regular and super 8mm

⁵⁵ Flory. "The Challenge of 8mm Sound Film." p. 582.

⁵⁶ Schmidt, Edward. "Developments in Magnetic Striping 8mm Sound Film." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 607-610. *IEEE Xplore*. p. 608.

⁵⁷ "Display Ad 10 -- no Title." *New York Times*, 11 Jun. 1960, p. 11. *ProQuest*.

⁵⁸ "Display Ad 10 -- no Title." *New York Times*.

⁵⁹ "Fairchild Cinephonic Advertisement." *Life*, vol. 49, no. 15, Oct. 1960, p. 55. books.google.com/books?id=wEQEAAAAMBAJ

⁶⁰ "New Wonder Metal Brings Rich Sound to Your 8mm Movies." *Popular Mechanics*, vol. 115, no. 4, Apr. 1961, p. 211. [books.google.com/books?id=et8DAAAAMBAJ&lr=.](https://books.google.com/books?id=et8DAAAAMBAJ&lr=)

magnetic sound film. One such projector was made by an Austrian company in 1974: the Eumig Mark S 810D.⁶¹ Two sets of sprocket gears and two aperture plates were provided that could be swapped out depending on which gauge was to be projected; for selecting the sound, you simply flipped a switch to super 8 or standard 8.⁶² A pre-stripped film could also be recorded onto using a microphone or cassette recorder with this projector.⁶³ Although standard 8mm film did exist in sound form in the various ways described above, it was never as common as magnetic sound for 16mm and super 8mm film.⁶⁴

IV. Uses and User Groups

The most fascinating aspect of the standard 8mm film format is the evolution of its utility over time by different user groups and communities. Introduced for the amateur film market, 8mm film was initially used to shoot home-movies and by 1950 it had reached such a wide audience of home-movie makers that it was starting to replace the 16mm film format as the “new substandard gauge for families.”⁶⁵ The manufacturing and sales of standard 8mm film and equipment was negatively affected by World War II just as many other consumer goods tied to leisure activities suffered the same fate during wartime. While 8mm film stock was scarce during the war, it was re-introduced to the market in the United States in 1946, simultaneous with camera manufacturers releasing a wealth of standard 8mm filmmaking equipment.⁶⁶ Due to the new equipment’s ease of use and inexpensiveness compared to the 16mm film format, the market for standard 8mm film expanded fast and “home moviemaking was transformed from a

⁶¹ *Eumig Mark S 810D User Manual*. mrelmo.co.uk/manuals/8mm/eumigs810.pdf.

⁶² *Eumig Mark S 810D User Manual*.

⁶³ *Eumig Mark S 810D User Manual*.

⁶⁴ *The Film Preservation Guide*. P. 12.

⁶⁵ Zimmerman. *Reel Families*. p. 118.

⁶⁶ Zimmerman. *Reel Families*. p.118.

relatively niche-market hobby to a mass cultural phenomenon.”⁶⁷ A famous illustration of the proliferation of 8mm home-movie usage by the public was the capture of “the most viewed recording of John F. Kennedy’s assassination, filmed on 8mm by Abraham Zapruder on November 22, 1963,” commonly referred to as the Zapruder film.⁶⁸

Starting in the late 1950s the format was also coopted for use in experimental and avant-garde films and by the mid-1960s was validated as an artistic medium by the likes of Stan Brakhage and Ken Jacobs.⁶⁹ According to Jim Hoberman’s writing on 8mm avant-garde film-programming at the Anthology Film Archives in the 1970s, although “no obscure masterpieces have been excavated from the first few decades of 8mm film-making” the 1960s saw a proliferation of such works.”⁷⁰ One example is *23rd Psalm Branch* by Brakhage, which was shot on standard 8mm in 1967; another pioneer artist of the 8mm experimental film movement was Bob Branaman with his edited-in-camera films shot on standard 8mm film rolls as early as 1958.⁷¹ While Kodak introduced the super 8mm film format in 1965, artists continued to use standard 8mm until advances in sound for super 8mm in the mid-1970s made it a more desirable format.⁷²

The standard 8mm film format was also used to release Hollywood cartoons, shorts, and segments of feature films, as well as special events and news stories for people to project at home.⁷³ Castle Film, a major company in this field, started distributing standard 8mm films for the mass market in the 1930s. According to a *New York Times* article, Castle Films distributed

⁶⁷ Howe, Maija. “The Photographic Hangover: Reconsidering the Aesthetics of the Postwar 8mm Home Movie.” *Amateur Filmmaking: The Home Movie, The Archive, The Web*. Bloomsbury, 2014. p. 40.

⁶⁸ Rascaroli, Laura, et al. editors. *Amateur Filmmaking: The Home Movie, The Archive, The Web*. Bloomsbury, 2014, p. 2.

⁶⁹ Hoberman, Jim, curator. *Home Made Movies: 20 Years of American 8mm and Super-8 Films*.” Anthology Film Archives, 1981. p. 2

⁷⁰ Hoberman. *Home Made Movies*. p. 1.

⁷¹ Hoberman. *Home Made Movies*. p. 1.

⁷² Hoberman. *Home Made Movies*. p. 2.

⁷³ *The Film Preservation Guide*. p. 37.

100ft rolls of news events for sale on 8mm film in 18,000 stores across the country as early as 1937.⁷⁴ This was a true prototype for the home-video phenomenon that was to come in the 1970s, as a well as a testament to the incredible success of the 8mm film format, launched only 5 years prior.

The 8mm film format was also the subject of extensive research as a potential educational tool in classes in both the United States and Europe. Louis Forsdale was at the forefront of the movement to incorporate the use standard 8mm sound film in United States elementary education. He organized a three-day-long conference on the subject that was held at Columbia University's Teachers College in November 1961, shortly after standard 8mm projectors and cameras had entered the mass market. 25 speakers from the fields of communication, education, and film technology (include SPMTE members and) spoke at the conference. The proceedings and lectures were later edited by Forsdale and published in *8mm Sound Film and Education*. Forsdale compared the 8mm sound film to the "paperback of books" and advocated for a full integration of projectors and short, one-subject films in school curriculums across the United States.⁷⁵ In Europe, a similar conference was held in Strasbourg in 1965 to discuss the "Teaching Potential of the 8mm Short Film." A summary of these panels was also compiled in a book called *The Use of Short 8mm Films in European Schools*. One of the main challenges faced in Europe was that most standard 8mm projectors, having been designed for amateur home-use, had inadequate throw and proved difficult to use in larger classrooms.⁷⁶ However, as the market for educational films expanded, projectors capable of longer throws and equipped with automatic-loading made the widespread use of 8mm film in European schools possible.⁷⁷

⁷⁴ Pryor, Thomas M. "Newsreels for the Home." *New York Times*, 04 Jul. 1937, p. 100. *ProQuest*.

⁷⁵ Forsdale, Louis, editor. *8mm Sound Film and Education*. Columbia University, 1962. p. 7.

⁷⁶ LeFranc, Robert. *The Use of Short 8mm Films in European Schools*. Council for Cultural Cooperation of the Council of Europe, 1967. p. 85.

⁷⁷ LeFranc. *The Use of Short 8mm Films in European Schools*. p. 86.

V. Regular 8 Production Ends

Kodak officially halted the mass production of 8mm film in 1992 but the distribution of private-marketed 8mm film continued until 2012; sometime between August and October, 2000, a section was added to Kodak's website that informed customers "while Eastman Kodak Company has not supplied (standard) 8mm movie film for many years, from time to time we do get requests for this format."⁷⁸ The section then provided the contact information for two vendors still supplying regular 8mm film at that time. One of those vendors, John Schwind of California, was successfully contacted via email for the purposes of this research project and shared the following about his current sale of 8mm film:

I no longer slit 2x8mm to 1 x8mm because I have not had any orders for single 8 for many years. Twenty years ago, I would get one or two per month, now I get zero requests for single 8mm. I think the basic problem is that the cameras are disappearing and the format had serious drawbacks. Namely the very short running time of 1.5 minutes per 25ft spool. Also, the cameras require a special spool which is not widely available. The advantage of single 8mm was the small camera size.

When I sold single 8 I would slit a 25ft regular 8 spool down the middle and load onto a single 8 spool that fit a UNIVEX camera. That would supply 2 single 8 25ft spools.⁷⁹

In the early 1960s, technicians seeking to achieve better sound and image quality from the standard 8mm gauge decided to decrease the perforation size to "allow for a wider photographic sound track area," which led to the invention of super 8mm film.⁸⁰ The downfall of

⁷⁸ "Kodak Super 8." 9 Oct. 2000. *Internet Archive: Wayback Machine*, web.archive.org/web/20001009010444/http://kodak.com/US/en/motion/super8/tip.shtml.

⁷⁹ Schwind, John. Personal Communication, October 2016.

⁸⁰ Staud, J.C. and W.T. Hanson. "Some Aspects of 8mm Color Sound Print Quality." *Journal of the SMPTE*, vol. 71, no. 8, pp. 557-562. *IEEE Xplore*. p. 557.

standard 8mm film started with the arrival of the truly superior super 8mm film format from Kodak and the single 8 format from Fuji. Super 8mm eventually won over both the independent avant-garde and home-movie market as it offered the same size and weight conveniences of standard 8mm film, but yielded 50% more image area and eventually a higher quality magnetic sound.⁸¹ Although regular 8mm still survived through the introduction of super 8mm, albeit taking a more marginal role than it had from the end of WWII to 1970, the death sentence on home movies really began with the first appearances of home-video recorders in 1981.⁸²

⁸¹ Ascher. *Filmmaking Handbook*. p. 5.

⁸² Zimmerman. *Reel Families*. p. 150.

Annotated Bibliography

Ascher, Steven, and Edward Pincus. *The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age*. Revised ed., Plume, 1999.

Ascher and Pincus provide a comprehensive guide to the many formats and processes that were available to amateur and professional filmmakers at the turn of the century. The source was used to catalog technical information such as the pitch, sprocket size, and aspect ratio of standard 8mm film and compare it to other types of amateur and professional film gauges.

"Display Ad 10 -- no Title." *New York Times*, 11 Jun. 1960, p. 11. *ProQuest*.

An advertisement for the Fairchild Cinephonic 8mm sound camera and projector utilized in this paper for providing prices for these devices.

Enticknap, Leo D. G. *Moving Image Technology: From Zoetrope to Digital*. Wallflower Press, 2005.

Enticknap provides a history of moving image technology, including a chapter on innovations leading up to moving images, obscure formats, color, widescreen, sound, and digital technology. The text is detailed and technical. This source was utilized extensively to establish the major technical breakthroughs that lead to the development of standard 8mm film as well as establishing the early history of the format.

Eumig Mark S 810D User Manual. mrelmo.co.uk/manuals/8mm/eumigs810.pdf.

User manual for the projector utilized to talk about its mechanism for playing both super 8mm and standard 8mm sound film at both 16fps and 24fps.

“Fairchild Cinephonic Advertisement.” *Life*, vol. 49, no. 15, Oct. 1960, p. 55.

books.google.com/books?id=wEQEAAAAMBAJ.

An advertisement for the Fairchild Cinephonic 8mm sound projector utilized to provide information on its mechanism for recording sound directly onto film using a microphone.

Flory, John. “The Challenge of 8mm Sound Film.” *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 581-585. *IEEE Xplore*.

The potential to use an optical soundtrack for standard 8mm film is explored and rebuked in this piece. The comparison between optical and magnetic sound for 8mm, and the reasons why magnetic sound prevailed are summarized in this paper to illustrate the early history of standard 8mm sound.

Forsdale, Louis, editor. *8mm Sound Film and Education*. Columbia University, 1962.

A summary of a conference on 8mm sound film in education held at Teachers College in Columbia University in 1962. Utilized in this essay to establish different user groups for standard 8mm film which included educators.

The Film Preservation Guide: The Basics for Archives, Libraries, and Museums. National Film Preservation Foundation, 2004.

A comprehensive guide on the preservation of major film formats including regular 8mm film from the National Film Preservation Foundation. This source was used for basic factual information on standard 8mm film as well as preservation activities relating to the format.

Hedden, W.D. and K. B. Curtis. "Early 8mm Sound Developments." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 585-588. *IEEE Xplore*.

Part of a series of article on standard 8mm sound film in this issue of the journal that provides historical background on the earliest 8mm sound experiments by Lloyd Thompson who was a pioneer in the field of 8mm film and 8mm film sound. Utilized in this essay to provide information on Thompson's early sound inventions for standard 8mm film.

Hoberman, Jim, curator. *Home Made Movies: 20 Years of American 8mm and Super-8 Films*. Anthology Film Archives, 1981.

Jim Hoberman's introduction to a series of standard and super 8mm film programs at the Anthology Film Archives in the 1970s was utilized to establish particular filmmakers and films that used the format in avant-garde film productions.

Holslag, Russell C. "News form the Industry." *Movie Maker*, vol. 12, no. 4, Apr. 1937, p. 177. *Lantern*.

This source is a news article utilized in this paper to provide details on one of the earliest single-width standard 8mm cameras, the Keystone K-8. The article was accessed on the *Lantern* website through NYU Libraries.

Howe, Maija. "The Photographic Hangover: Reconsidering the Aesthetics of the Postwar 8mm Home Movie." *Amateur Filmmaking: The Home Movie, The Archive, The Web*. Bloomsbury, 2014.

An essay used to discuss the prevalence of amateur standard 8mm filmmaking and its effect on the switch of home-moviemaking from a niche hobby to a popular phenomenon.

Kattelle, Alan D. *Home Movies: A History of the American Industry, 1897-1979*. Transition Publishing, 2000.

A comprehensive history of amateur motion picture technology from the earliest film formats up to video camcorders in the year 2000, with a focus on these topics in the United States. Kattelle also provides information on amateur organizations, a guide to other literature on amateur motion pictures, and on collecting amateur equipment and film. This text was used extensively for information on specific 8mm cameras, projectors, and film stocks.

Kodak. "Kodak Super 8." 9 Oct. 2000. *Internet Archive: Wayback Machine*, web.archive.org/web/20001009010444/http://kodak.com/US/en/motion/super8/tip.shtml.

A comparison of this archived version of the Kodak website on super 8mm film with the version archived the previous time indicates the addition of information on who to contact to purchase 8mm film.

Kodak. "Super 8 mm Film History." *Internet Archive: Wayback Machine*,
web.archive.org/web/20071112095846/http://www.kodak.com/US/en/motion/s8mm/history.jhtml.

An archived version of Kodak's super 8mm history webpage was utilized for information on the advent of the super 8mm film format and its effect on standard 8mm film.

Kodak. "Super 8 mm Film History."
motion.kodak.com/US/en/motion/Products/Production/Spotlight_on_Super_8/Super_8mm_History/default.htm.

A current version of super 8mm film history on Kodak's website provides a brief history of the super 8mm film format in the form of chronological bullet points on. This source was utilized to describe how double-perforated 16mm film is exposed in standard 8mm cameras.

LeFranc, Robert. *The Use of Short 8mm Films in European Schools*. Council for Cultural Co-Operation of the Council of Europe, 1967.

Similar to Louis Forsdale's work in the United States, this is a compilation of the proceedings of a conference held in Strasbourg in 1965 to discuss the potential of 8mm film in education.

"New Wonder Metal Brings Rich Sound to Your 8mm Movies." *Popular Mechanics*, vol. 115, no. 4, Apr. 1961, p. 211. books.google.com/books?id=et8DAAAAMBAJ&lr=.

Advertisement for Kodak's projector that allows the recording of sound directly onto standard 8mm film as it runs through the projector. Utilized in this essay to illustrate the early history of standard 8mm sound equipment for home movies.

Nyström, Jan-Eric. "History of Sub-35mm Film." *Ani-Mato: Spare Time Labs*, www.sparetimelabs.com/animato/animato/.

This page is a section of the website with information on early small-gauge amateur film formats including various obscure and esoteric ones. The source was utilized for information on reduction-printing commercial titles onto the 9.5mm film gauge.

Pryor, Thomas M. "Newsreels for the Home." *New York Times*, 04 Jul. 1937, p. 100. *ProQuest*.

An article discussing the beginnings of the Castle Film distribution company. Utilized in this essay to establish the beginnings of home-movie marketing of commercial films in the standard 8mm format.

Rascaroli, Laura, et al. editors. *Amateur Filmmaking: The Home Movie, The Archive, The Web*.

Bloomsbury Publishing, 2014.

The introduction to a compilation of essays on amateur filmmaking. Used in this paper specifically to establish the standard 8mm film format of the Zapruder film.

Repinski, Cynthia A. *The UniveX Story: Universal Camera Corporation*. Centennial Photo Service, 1991.

This book provides a detailed history of one of the first corporations to offer a camera designed for single-width 8mm film. This text will be utilized to introduce the UniveX model A-8 and the proprietary film spool and special film stocks produced by the Universal Camera Company for the camera. The source also provides extensive background information on all activities of the Universal Camera Corporation involving 8mm film.

Schmidt, Edward. "Developments in Magnetic Striping 8mm Sound Film." *Journal of the SMPTE*, vol. 70, no. 8, Aug. 1961, pp. 607-610. *IEEE Xplore*.

One of the pieces in this issue of SMPTE focused on standard 8mm sound. Information from this source was utilized to describe the first Fairchild Cinephonic standard 8mm sound camera.

Schwind, John. Personal Communication, October 2016.

Email communication with 8mm film vendor summarized in the essay.

Thompson, Lloyd. "Problems in the Design of an 8mm Magnetic Sound-on-Film Projector."

Journal of the SMPTE, vol. 70, no. 8, Aug. 1961, pp. 588-589. *IEEE Xplore*.

A summary of the challenges facing standard 8mm magnetic sound is presented as part of a larger series of articles on 8mm sound in this volume of the SMPTE journal. The main challenges were the slow linear speed of standard 8mm film and the small area available on the film for the magnetic stripe, both alluded to in this paper.

Staud, J.C. and W.T. Hanson. "Some Aspects of 8mm Color Sound Print Quality." *Journal of the*

SMPTE, vol. 71, no. 8, pp. 557-562. *IEEE Xplore*.

A discussion of the reasons to move from the standard 8mm film format towards a higher quality super 8mm film format by reducing the perforations of standard 8mm film.

Trickett, Mike. "8mm Film Formats." *Reel Deals*, 2009. reeldeals.com.au/8mm/8mm.htm.

The Reel Deals website is "The Aussie Film Collectors' Magazine," and includes a wealth of information on rare and obscure film formats and technology. Their "8mm Film Formats" article was especially helpful for this project as it provided information on and pictures of rare single-8 film cartridges from Bell & Howell and Agfa.

UniveX Advertisement. *The Hartford Daily Courant*, 23 May 1937, p. 7. *Newspapers.com*.

An advertisement for the UniveX cameras used to illustrate how inexpensive these single-width 8mm cameras from Universal Camera Corporation were.

Zimmermann, Patricia R. *Reel Families: A Social History of Amateur Films*. Indiana University Press, 1995.

While this book focuses mostly on the social history of small-gauge and amateur film, valuable technical information is interspersed throughout. Information from this source was utilized throughout the essay especially for a section on Bell & Howell's 8mm camera production history and Kodak's rivalry with Bell & Howell.