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### Kodel 16mm / Kemco HoMovie

Making its debut in 1930, the Kodel 16mm Kemco HoMovie system, invented by Clarence Ogden at the Kodel Electric & Manufacturing Company of Cincinnati, Ohio was meant to expand the consumer base of amateur film making through a unique zig-zag, or “boustrophedonic,” method of recording and projecting film, cutting costs for film stock by an advertised 75%, but it was quickly made obsolete two years after its invention by the introduction of 8mm film by Eastman Kodak. Though the physical makeup of the film stock used for Kodel 16mm was the same standard 16mm film that could be put into any camera, once it was shot the Kemco HoMovie system exposed the film in such a way that it would only ever be playable through a Kemco HoMovie projector. This, combined with its extremely steep initial equipment cost would end up dooming the Kemco HoMovie system to obscurity. Despite the creative solution to a complicated problem, Kodel 16mm would only prove to be a stepping stone to the much more accessible 8mm film invented by Kodak in 1932. The amateur film makers who Ogden thought would flock to his invention saved more money by switching over to the far less expensive and standardized 8mm film cameras instead. A number of extra features also pioneered by Ogden in his Kemco HoMovie system were not enough to save it from market insignificance despite their potential advantage for home film projection. In the

end, despite concerted advertisement campaigns, Kodel barely made more than a few hundred of their Kemco HoMovie system, making it a very rare format in need of preservation, its unique mechanism extremely complex and difficult to maintain.

In 1926 Clarence Ogden working for the Kodel Electric & Manufacturing Company in Cincinnati, Ohio began developing what would come to be known as the Kemco HoMovie system.<sup>1</sup> By 1928, enough of the groundwork for the Kemco HoMovie system had been laid for Kodel to begin promoting their upcoming product in major trade magazines. As advertised by Kodel in an attempt to build anticipation of their new system, the company boasted that the new method took over \$200,000 and over 10 engineers to develop in their laboratories. At nearly \$3 million in today's dollars, this was quite the investment for a company that was just entering the photography and film business and had previously focused only on manufacturing radios and smaller electronic parts and appliances, but Clarence Ogden had guessed that his new invention would be a truly "Revolutionary New Movie Principle" that would "Astonish the Movie World!"<sup>2</sup>

Debuting in 1930, this revolutionary design was indeed noticed by experts in the field, causing some excitement.<sup>3</sup> As Ogden predicted, the zig-zag motion (sometimes called "boustrophedonic," Greek for "as the ox plows")<sup>4</sup> critical to the camera's unique design impressed many, particularly because it still took standard 16mm film. "The latest and most

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<sup>1</sup> American Cinematographer, November 1929, Kodel Advertisement, pg. 28

<sup>2</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

<sup>3</sup> Cinematographic Annual, Volume 1, 1930, Hal Hall, pg. 524

<sup>4</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

revolutionary development in the 16mm field is the Kodel Homovie ...it uses any make of film, taking hundred foot rolls, but impressing on them four times as much action as is usually photographed.”<sup>5</sup> There was no questioning that the camera had successfully reduced the cost of 16mm film stock for the average amateur film maker, potentially taking a big chunk out of the revenue stream of Kodel’s biggest competitor, Eastman Kodak, which had essentially cornered the market on 16mm film.

Sadly for Kodel, the unique design of their Kemco HoMovie system also made it a very expensive initial investment for amateur film makers. Although it could use 16mm film, once exposed the film became totally unplayable in any camera aside from a Kemco HoMovie one. Without replicating the zig-zag motion used to capture the image, any projector would display a series of four small images at a time. While the consumer might save on film in the long run, the initial cost of “\$252.50-\$90 for the camera, \$150 for the projector, and \$12.50 for a folding screen,”<sup>6</sup> or \$3,600 today, was prohibitively expensive. Knowing this would make some film makers wary of investing, one advertisement exclaimed that “After 3 Hours, 44 Minutes of Picture Taking the Kemco Outfit Costs You Nothing!”<sup>7</sup> Considering that Kodel aimed to sell their product to film makers of more modest means and amateurs that might balk at the cost, it is not surprising that not too many sold or were ever produced. How long would it take for someone only interested in taking home movies and vacation films to get to the 3 hour and 45 minute mark?

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<sup>5</sup> Cinematographic Annual, Volume 1, 1930, Hal Hall, pg. 524

<sup>6</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

<sup>7</sup> Movie Makers, November 1930, pg. 673

Indeed, already by 1931 advertisements celebrating the cost effective new method that would revolutionize the film industry paid for by Kodel for the Kemco HoMovie system began to diminish. They came to be replaced by personal ads taken out by individuals attempting to resell their Kemco HoMovie systems.<sup>8</sup> Only a year after its introduction, it was being resold by consumers for as little as \$155, or \$2,200 today. By 1933, advertising and mentions in trade journals seem to cease, the Kemco HoMovie system's life as a popularly used and sold recording and projection format lasting only about three years. Very shortly after Kodel's revolutionary system was released, Kodak developed a new method that made film just as cheap but could be run on far less expensive equipment.

Physically, Kodel 16mm film stock was identical to any other 16mm film stock of the early 1930s, whether acetate or nitrate. No special emulsion or perforation was needed, making it seem as though Kodel 16mm could be played in any projector. What set Kodel 16mm apart was the way in which the accompanying camera in the Kemco HoMovie system exposed the film and how the projector played it back. The camera introduced a second, horizontally oriented intermittent motion to move the film left to right, developing sixteen frames per second, as opposed to the usual four.<sup>9</sup> First, the camera would expose the top left corner, then the top right, then the bottom right and finally the bottom left before moving down to start the process over again.<sup>10</sup> This unique way of moving the film stock around as it developed in the

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<sup>8</sup> Movie Makers, April 1931, Classified advertising, pg. 237

<sup>9</sup> American Cinematographer, November 1929, Kodel Advertisement, pg. 28

<sup>10</sup> McKeown's Price Guide to Antique & Classic Cameras 8th edition 1992-1993, James McKeown, pg. 67

camera had to be replicated in the projector as a normal camera would only show the four pictures in each frame at a time, making the film totally incoherent.

This distinctive design meant that anyone performing maintenance on it would be presented with much more challenging repair jobs than a Kodak or Bell & Howell 16mm projectors or cameras. With only one small company in the world that hardly had any investment in photography and film before, this may have discouraged interested amateur film makers from making the investment further. The Kemco HoMovie system would only become an economical choice for the amateur film maker if it was used extensively, most likely over a long period of time. Home movie enthusiasts could have worried that perhaps the much more complex mechanical system would break down before that investment could be worked out of it.

Aside from this, though, the camera and projector appeared very similar to other cameras and projectors of the time. "The camera, in a Bakelite body, measured 3-1/2" by 5" by 8", almost exactly the size of the Model B Cine-Kodak, but slightly heavier."<sup>11</sup> It had a standard 15mm fixed focus lens and the projector was equipped with a 50V, 250-watt lamp, all standard fair for the day, the Kemco HoMovie system not needing anything more extravagant than its zig-zag motion to be projected. If one were so inclined, Kodak sold a number of accessories for the Kemco HoMovie system, including, but not limited to "highly detailed instruction books... a

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<sup>11</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

titling stand, editor, enlarging outfit, film album, and elegant HoMovie console.”<sup>12</sup> Clearly, Ogden thought there was a long life to his film system.

However, if one decided to look a bit deeper, one might discover two other hidden gems inside the Kemco HoMovie camera and projector that Kodak decided not to advertise as loudly as their main cost cutting process. First, Ogden claimed that by projecting the light from the camera onto a mirror inside and through a special type of glass, the Kemco HoMovie projector could project films even in a well lit room without losing any image quality to light pollution. “By the creation of what is known as a Day-Lite Recreator, the picture is projected against a mirror at an angle of forty-five degrees, which in turn is shielded from light and reflects the picture through a translucent glass screen, reproducing the picture in all the fine detail in daylight.”<sup>13</sup> It is astonishing that only in one ad, buried in the one page continuation 10 pages after the ad begins that such a feature would be advertised. Certainly for amateur film makers of more modest resources who might not have had access to high quality theaters to show their films, such a feature would be highly desirable. Yet, there are no big headlines celebrating Kodak 16mm’s ability to be projected in broad daylight.

The other hidden feature is the ability to freeze on any single frame and hold it indefinitely without potentially damaging the film itself. At the time, high powered lamps inside projectors could potentially have burned or melted the films if they were kept on a single frame too long. However, Clarence Ogden devised a method to get around that. “One of the remarkable features of this projector is that the operator may stop the projector at any time,

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<sup>12</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

<sup>13</sup> American Cinematographer, November 1929, Kodak Advertisement, pg. 38

leaving a huge still picture standing on the screen. A special heat absorbing glass shutter prevents film from breaking or blistering.”<sup>14</sup> Again, this seems ideal for home movie showing as vacationers might want to show off particular images from their films to friends and to be able to savor the details of what they saw. This feature would have surely been very exciting to any film student at the time, allowing them to very carefully analyze the structure of a scene at their leisure.

Though these small features may have been useful to others, there is absolutely no ambiguity at all that Clarence Ogden and Kodel intended their product to be for amateurs and home film makers. The 16mm format was already looked down upon by more serious film makers dedicated to 35mm as a true film making format. Calling it Kodel 16mm puts it outside the class of cinematic quality film stock. Though, it seems odd that there was never any attempt to make a Kodel 35mm as the general principle behind Kodel 16mm could be easily recreated on 35mm. Additionally, it should be obvious that with a name like Kemco HoMovie it was clearly meant for the home.

If that did not make it clear enough, though, the numerous advertisements in trade journals from 1928 to 1933 were all heavily targeted to amateurs with little money. Over and over their advertisements featured illustrations of small families gathered around projections of baby pictures or vacation sites- subjects of course more interesting to home viewing than major cinemas. In some of their advertisements, a mail in coupon would be included so that families

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<sup>14</sup> American Cinematographer, November 1929, Kodel Advertisement, pg. 38

could look through a deluxe 48 page catalog to understand all of the advantages the Kemco HoMovie system offered.<sup>15</sup>

It should be noted, however, that the whole Kemco HoMovie system is much louder than normal projectors and perhaps for this reason may not have been as enjoyable for home use as advertised. The second mechanism required for the horizontally oriented intermittent motion necessary for the zig-zag method to work made twice as much noise. Of course, if the projector were sitting in a fire proof booth or at the back of a theater projecting acetate film, there might be enough noise coming from the audience, the music player or even the film itself if it contained sound to block out the extra noise. In homes, though, particularly if the family was sitting right next to the projector as they are depicted doing so many times in advertisements, the loud noise would be distracting indeed.<sup>16</sup>

This isn't to mention that if the camera were not powered by electricity, it would have to be wound up with a spring loaded clockwork mechanism. While this was not unusual for cameras of the time, most cameras used half of the machinery as the Kemco HoMovie system's camera did. While you could shoot four times as much footage and thus go four times as long without replacing a reel of film, you also had to stop and wind up your camera twice as much, somewhat lessening the convenience factor that was also used as a selling point by Clarence Ogden and Kodel.

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<sup>15</sup> Movie Makers, November 1930, pg. 673

<sup>16</sup> <https://www.youtube.com/watch?v=DjtfShJgQsI> George Willeman



Despite these problems, the Kemco HoMovie system was an improvement on what had come before. Since 1923 and Kodak's introduction of 16mm, also made with amateur film makers in mind like Kodel, researchers and engineers had been looking for a way to reduce costs, thus expanding their market. Although Kodak had wanted to make the transition to smaller film gauges earlier, some of their engineers worried that the material grain used to make emulsion for film was not high quality and fine enough to capture details at such low resolutions.<sup>17</sup> Despite claims to the contrary in their advertisements, Kodel 16mm recordings do appear blurrier than their normal Eastman Kodak 16mm counterparts.<sup>18</sup> Perhaps if Kodel had made their own film stock as well as camera and projector system, they could have engineered a higher quality version that would have performed better for the specific needs of the Kemco HoMovie system.

The revolution was real, though, at least in some senses. Kodak, along with its biggest competitor in the company Bell & Howell and a complete new comer the Stewart Warner Company, saw that there was a demand for a smaller, cheaper gauge and Kodel had given them the inspiration for how to tackle the engineering problem. Experimentation with altering the shape of 16mm film would eventually lead to the creation of 8mm and Clarence Ogden had taken some of the early steps. There was still a problem, though: "A totally new gauge would perforce make all of that equipment useless in production of the new gauge. Would the savings in film cost justify the investment in new machiner? Not Likely..."<sup>19</sup> Like Ogden, all three

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<sup>17</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 94

<sup>18</sup> <https://www.youtube.com/watch?v=DjtfShJgQsl> George Willeman

<sup>19</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 95

companies understood that the new film gauge would have to use existing technology. Unlike Ogden, they applied this lesson to the machines that would capture and play them back to the consumer, allowing them to keep and use the machines they already had.

Eastman Kodak began experimenting with altering 16mm's shape while still being runnable through a regular camera and projector. "Thus it was in 1930-1931 a camera was built in which a length of 16mm was run through exposing one half of the film; the film spools then reversed in position and the other half of the film exposed. After direct reversal processing as with 16mm, the film was slit in half and the two pieces spliced together... There would be only one row of perforations, but that was adequate for such narrow film."<sup>20</sup> This was to be the first 8mm film, though it would take more experimentation before some problems could be worked out and true 8mm film was first produced and used. One such problem was that of the film grain. As mentioned earlier, Eastman Kodak 16mm film grain did not have a high enough resolving power and definition. Kodak laboratories would have to take it upon themselves to make a new kind of emulsion of high enough quality to play their new film format.

In 1932, 8mm was officially launched with Kodak's Cine-Kodak 8 model 20 for \$29.50 and their projector at \$22.50, totaling up to \$55.00, or roughly \$780 dollars adjusted for inflation. The 8mm system used film at the same rate as the Kemco HoMovie camera, but at less a quarter of the initial cost as the Kemco. Though it didn't have the interesting new features of the Kemco, like freezing on a frame indefinitely or the ability to play in broad

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<sup>20</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 95

daylight, the Cine-Kodak 8 model 20 was incredibly less expensive and thus much more accessible. The praise Kodak's answer to the Kemco received in trade journals should have been a very clear sign to Kodel. "They also observed that while this was not the first attempt to make amateur movies more affordable, this venture being backed by the largest photographic organization in the world stood a far better chance of succeeding."<sup>21</sup> It was obvious to the critics that Kodak stood a far better chance than Kodel did of bringing easy film making to the masses.

Kodak was not alone, though. The Stewart Warner Company of Chicago debuted their entry into movie making technology with their 8mm Buddy 8 camera and projector, \$29.50 each, or \$420.47 after inflation.<sup>22</sup> Again, this camera that achieved much the same film stock cost cutting effect as the Kemco system did so at a much cheaper equipment cost. Bell & Howell, Kodak's biggest competitor at the time also introduced their 8mm camera in 1935, but all the film used in each of these three cameras was provided by Eastman Kodak, only later to be split down the middle to make 8mm film.<sup>23</sup> Kemco HoMovie system barely had a chance to get off the ground before a wide range of serious and well-funded alternatives began to undermine its unique claim to cutting film stock costs.

With such a short life and small number ever produced or sold, there isn't much left to preserve of the Kodel 16mm format aside from the associated machines themselves. Even if the format had been more popular, major production companies were neither targeted

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<sup>21</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 96

<sup>22</sup> The History of Movie Photography, Brian Coe, pg. 43

<sup>23</sup> Home Movies: A History of the American Industry, Alan Katelle, pg. 96

nor interested in the format, resulting in no known cinematic works. The Kemco HoMovie system was meant to be for film makers who would rarely if ever show their films off to a large audience. Certainly there is still some film that will work exclusively on Kemco HoMovie system projectors and if one had a camera, one would be able to use it to create new films if one had 16mm.<sup>24</sup> In fact, the only known film that survives of the Kemco HoMovie system is of an air show being held at Wright Field outside of Riverside, Ohio in 1930.

It is doubtful that most of those who did purchase the Kemco HoMovie system and shot films with it kept their films in ideal conditions. Considering that the only films that were probably ever made on Kodak 16mm are from the 1930s, there are going to be very serious decay concerns with anything found by an archivist, though these issues shouldn't be much different than any normally found in 16mm. Films of this format are also going to be much more susceptible to damage if one considers that each individual frame actually constitutes four projected images. All the damage will show up four times as large as in normal 16mm film, making it particularly difficult to take care of.

Due to its relatively rare status, the Kemco HoMovie system has become a highly prized collector's item for anyone looking for antique film cameras and projectors.<sup>25</sup> Currently there is at least one known fully intact Kemco HoMovie system in the Alan Kattelle collection of Northeast Historic Film in Maine. Along with the projector and camera they also have a maintenance kit and the accompanying instruction manuals as well. There is also a second known Kemco HoMovie projector with an accompanying reel from a 1930 air show in Riverside,

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<sup>24</sup> <https://www.youtube.com/watch?v=DjtfShJgQsl> George Willeman

<sup>25</sup> McKeown's Price Guide to Antique & Classic Cameras 8th edition 1992-1993, James McKeown, pg. 67

Ohio by a local historian named Allan Routt as interviewed by George Willeman of the Library of Congress.

Although one of the first commercially available methods for cutting the cost of 16mm film in order to make it more available to amateur home movie makers, Clarence Ogden's Kemco HoMovie system and its associated Kodel 16mm ended up being more of a link between 16mm and 8mm than a format of its own. Its unique zig-zag, or boustrophedonic filming pattern, made possible by using two forms of intermittent motion set it apart from any other format when it was released, immediately cutting costs of film stock by 75%. Additionally, the system pioneered other smaller, but still significant technological advancements for the home movie enthusiast, like freezing the projected image onto one frame or being able to project in full daylight. However, the ingenious solution invented by Clarence Ogden presented the user and his employer, the Kodel Electric and Manufacturing Company with a number of challenges. The system itself was simply too expensive for any amateur film maker to afford, despite the cost cutting effects on film and maintenance of the machine was much more difficult. Additionally, shooting film with a Kemco HoMovie camera meant it could only ever be projected with a Kemco HoMovie projector. Finally, 8mm would be introduced only two years later, achieving the same cost cutting benefits as Kodel 16mm without all the technical problems and a far cheaper initial investment. The inherent flaws in the Kemco HoMovie system were simply too much, especially considering that its cost saving claims in numerous advertisements were dubious at best.

## Annotated Bibliography

1. Kattelle, Alan. *Home Movies: A History of the American Industry 1897-1979* (2000),

Transition Publishing

This had a great 2 page spread on the history of Clarence Ogden's involvement with Kodak and his invention of the Kodak Home Movie system. Particularly useful was also how much it integrated Kodak 16mm into the history of other formats it coexisted with and what small steps were taken in between.

2. McKeown, James. McKeown, Jan. *McKeown's Price Guide to Antique & Classic Cameras 8th edition 1992-1993* (1992) Centennial Photo Service

Though not by any means a guide to the historical context of the Kodak Home Movie system, it was useful in further explaining the mechanical workings of the camera and surprising to see the system has appreciated in value. Though, perhaps not when one considers inflation.

3. Wileman, George. <https://www.youtube.com/watch?v=DjtfShJgQsl>

Incredible that this video even exists, much more so that there is actual recording of an original film shot using a Kodak still around. It's really valuable to see just how loud and distracting the projector is, and also to see just how much more complicated the clockwork is compared to other projectors at the time.

4. Coe, Brian. *The History of Movie Photography* (1982) Eastview Editions.

Also useful for getting some historical context along with the Kattelle book, this one had a bit less on the Kodak 16mm process itself. Interesting to note, though, that it is written by the once curator for the Kodak Museum in London. Understandably, it focused more on Kodak's invention of 8mm rather than the contributions of other companies.

5. Beardslee Carrigan, John. *Movie Makers* (1929)

A trade journal at the time primarily oriented toward amateur film making. They took plenty of advertisements over the years from Kodak to promote the Kemco Homovie system, taking some of the widest 4 page spread advertisements. Many of Kodak's competitors would also advertise their 8mm products in this periodical, too.

6. Aller, Simeon. Smith, Wesley. *American Cinematographer* (1932)

A contemporary publication that reviewed and advertised any new film apparatus. In their Forerunners of Amateur Film section, they recognized that while the Kemco HoMovie system sounded fascinating and unique, it had already fallen by the wayside by 1932, bogged down by technical difficulties. So much hype, yet the system was apparently a flop.

7. Hall, Hal. *Cinematographic Annual* (1929)

It was great to find a full fledged review of the Kemco HoMovie system rather than just a paid advertisement, however short the review was. Of course, by

1929 one wonders how much access the reviewers had to it, since it wasn't released commercially until 1930.