

Video Leaves the Studio: The Loewe Optacord 500 and 600

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In the 1960s, toward the very beginning of the video era, West German electronics manufacturer Loewe Opta (“Lion Optical,” now known simply as Loewe) positioned itself at the forefront of the emerging field of video technology with two groundbreaking video recorders, the Optacord 500, released in 1961, and the Optacord 600, first released in 1965. These two devices marked major steps toward making video recorders smaller, lighter, and more affordable. The Optacord 500, the first European video recorder, was also among the very first video recorders portable enough for use outside of a television studio. Only four years later, in 1965, this cutting-edge video recorder would already come to seem large and cumbersome, as Loewe revised its 500 model, releasing the Optacord 600, weighing roughly eight times less than its predecessor and small enough to be released in a (rather large) carrying case. One of the very first video recorders designed and marketed (at least in part) for use in the home, the Optacord 600 marks an early starting point for the very concept of home video, which would not fully take hold of the culture for another ten years or more, with the development of Betamax and VHS in the mid-1970s.

Background: A Brief History of Loewe Opta

Loewe was founded in 1923 by brothers Siegmund and David Ludwig Loewe as a radio manufacturing company. After Hitler came to power in the 1930s and the Nazi government “aryanized” Jewish-owned businesses, the brotherse migrated to the US (where Siegmund Loewe would befriend Albert Einstein). The company changed names several times during this period and its facilities were used for military purposes, until Siegmund Loewe regained control of the company in 1949. After his death in 1962, Philips would come to hold the majority of shares in Loewe and products like the 1965

Optacord 600 would share some features and even parts with similar products produced by Philips. The Optacord series of products began with audiotape recorders (such as the Optacord 400 series), for which Loewe was well known, before introducing their first video recorder, the Optacord 500.

Optacord 500: Making the Video Recorder Portable

Loewe introduced their first video recorder, the Optacord 500, at the consumer electronics trade fair Internationale Funkausstellung Berlin (IFA, or the “Berlin Radio Show”) in 1961.¹ The first video recorder manufactured in Europe, the Optacord 500 is still featured on the Loewe website,² in their Wikipedia entry,³ and in other histories of the company as a notable milestone in their development. Even though the Optacord 600 series would be manufactured in greater numbers over a longer period of time, today the Optacord 500 is (somewhat) better remembered and has had (slightly) more written about it, given its status as the first European VTR. Maybe three hundred Optacord 500s were sold.⁴

Although the Optacord 500 is sometimes mistakenly identified as the first European home video recorder⁵ (this distinction would belong to the Optacord 600, if to any Loewe VTR), its great breakthrough was in its (for the time) “compact design and

¹David Fisher, “The Quest for Home Video,” Terra Media, accessed October 16, 2013, http://www.terramedia.co.uk/media/video/Loewe_Optacord_500.htm

²Loewe, “History,” Loewe website, accessed November 18, 2013 <http://corporate.loewe.tv/en/loewe-ag/company/brand/history.html>

³Wikipedia contributors, “Loewe AG,” Wikipedia, The Free Encyclopedia, accessed November 18, 2013, http://en.wikipedia.org/wiki/Loewe_AG

⁴Friedrich Sambs, ZKM Laboratory for Antiquated Video Systems, email correspondence, November 15, 2013.

⁵David Fisher, “The Quest for Home Video.”

easy operation,”⁶ allowing it to be used by professionals outside the confines of a television studio and in a wider array of fields. A glance at the weight and dimensions of the Optacord 500 gives some idea of just how far Loewe and other companies at this time still had to go in realizing their goal of producing a truly compact video recorder. The Optacord 500—remarkably compact in its day—weighed 126 kg (almost 278 pounds),⁷ an astonishing figure today and one that would mark this unit as something of a dinosaur in a mere four years, as exponentially lighter video recorders—including its successor, the Optacord 600—would enter the market. On its release, the Optacord 500 cost 50,000 DM (approximately 12,500 US Dollars at the time).⁸ The 2-inch tape cost around 300 DM (approximately \$75 at the time). Furthermore, the vacuum tubes used in this system were very expensive to replace⁹

Heavy as it was, Loewe designed the Optacord 500 to be as compact and portable as possible. The machine was housed in a freestanding console with shelves and on wheels, looking something like a lab cart (Figure 1). A separate monitor could be attached to the top of this wheeled cart for playback, or the machine could simply be attached to some other monitor. The console itself, without any monitor attached to it, measures 102 centimeters (approximately 40 inches, or over 3 feet) tall, with a width of

⁶Helmut Haas, “Optacord 500—einBildbandgerät für das industrielle Fernsehen,” *Kino-Technik*, 16 (1962): 279-281. (The quoted section appears in English translation in the original).

⁷Haas, “Optacord 500—einBildbandgerät für das industrielle Fernsehen.”

⁸ Helmut Haas, “Loewe Optacord 600: A Portable Tape Recorder,” *Loewe OptaKurier*, 22 (1965): 2-4.

⁹ Stefan Richter, email correspondence, October 22, 2013.

71 centimeters (approximately 28 inches) and a depth of 70 centimeters (approximately 27.5 inches).¹⁰



Figure 1. Optacord 500 with Attached Monitor (Loewe)

This design, outmoded as it would soon become, marked an important first step in getting video recording equipment to places outside of their traditional home of the television studio. Indeed, evidence would suggest that the Optacord 500 was mainly used for mobile television reporting, recording video on location. A photograph accompanying an article about the Optacord 500 in the company publication, *Loewe OptaKurier*, shows a mobile television unit using the Optacord 500 out on the street, the large mobile console sitting inside of a Volkswagen van, while a camera operator stands on the van roof shooting video for the Optacord to record (Figure 2). Based on discussions with former and current Loewe employees, as well as collectors of Loewe equipment, it would seem that this photograph is an accurate representation of how this relatively transportable new

¹⁰Haas, “Optacord 500—einBildbandgerät für das industrielle Fernsehen.”

video recorder was used in the very early 1960s.¹¹ Outside of the television industry, the Optacord 500 was mainly used in educational settings and by the military.¹²



Figure 2. On Location Shoot with Optacord 500 (*Loewe OptaKurier*)

Technical Specifications

The Optacord 500 is an open-reel video recorder, with inputs for both a camera and a broadcast television signal, and records onto 2-inch (50.8 mm) magnetic tape.¹³ The Optacord 500 is equipped with vacuum tubes, rather than transistors like the later Optacord 600.¹⁴ It uses the helical scan method, which was still quite new at the time and would help lead to the production of smaller, less expensive video recorders over the

¹¹Richter, email correspondence, October 28, 2013.

¹²Friedrich Sambs, ZKM Laboratory for Antiquated Video Systems, email correspondence, 15 November 2013

¹³ Helmut Haas, "Optacord 500—ein Bildbandgerät für das industrielle Fernsehen."

¹⁴Sambs, email correspondence, 15 November 2013

course of the 1960s.¹⁵ Although it would rapidly become common following its initial public presentation by Toshiba in 1959, in 1961, when the Optacord 500 was released, the first video recorders using the helical scan method were just entering the market (including the one manufactured by helical scan innovator Toshiba).¹⁶ Helical scan was “the leading television-recording story of the year,” according to the *Journal of the SMPTE*, as seven manufacturers set to work on releasing the first helical scan video recorders, at a lower cost than previous recorders, in 1961: in addition to the Loewe Optacord 500, the Ampex VR-8000, the RCA MR-700, the Sony SV-201, the Toshiba TVR-1B, as well as prototypes from Japan Victor and Philips, were either released or shown to the public that year.¹⁷

The 2-inch tape is threaded onto the machine in an alpha wrap. In alpha wrap machines, the tape is wound a full 360 degrees around the head drum (the path of the tape forming a lowercase Greek letter alpha). For this reason, the two tape reels on alpha wrap machines, like the Optacord 500, are set at differing heights, so that the tape may wrap fully around the head drum without wrapping around itself. Alpha wrap machines only require one video head. One drawback of alpha wrap is that there is only one head, which writes a complete stripe for every revolution of the drum, leaving a signal gap when the head briefly leaves the tape to begin scanning a new line. (In an omega wrap, in which the tape is wound 180 degrees around the head drum, two heads are used, meaning that there is no point at which a video head is not in contact with the tape.) Alpha wrap also

¹⁵Total Rewind, “One Million Years BC (Before Cassette),” accessed November 15, 2013, http://www.totalrewind.org/pre_hist.htm

¹⁶Albert Abramson, *The History of Television 1942-2000* (Jefferson, NC: McFarland, 2003) 87.

¹⁷John L. Calhoun, “Progress Committee Report for 1961,” *Journal of the SMPTE*, 333.

makes threading the tape more cumbersome and omega wrap eventually became standard. Alpha wrap was the first method used in helical scan video recorders, however, and would remain common for a few years.¹⁸

The Optacord 500 has a tape speed of 19.05 centimeters (or 7.5 inches) per second. Of the initial seven helical scan video recorders shown to the public that year, the tape speeds were said to range from 7.5 inches per second to 15 inches per second, placing the Optacord 500 tape speed at the slower end of this range.¹⁹ The Optacord 500 was designed to record 50 interlaced fields per second, to be in compliance with West German television standards of the time. (The PAL standard, which also calls for 50 interlaced fields per second, would be patented by Telefunken in 1962, unveiled to the European Broadcasting Union members in 1963, and only fully adopted later in the decade.) It records one field, or one half frame, in each passage from top to bottom of the tape.

The Optacord 500 can record up to an hour and forty-five minutes of material onto a 2-inch tape.²⁰ The soundtrack is recorded at the top of the 2-inch tape, with the control track at the bottom. The console features five large push buttons for major functions: On/Off, Stop, Rewind (Adjustable), Record, and Playback.²¹ Unlike later video recorders, the Optacord 500 has no Pause button. The rewind is adjustable,

¹⁸ Association of Cinema and Video Laboratories, “Glossary of Video Terms,” accessed November 20, 2013, http://www.acvl.org/acvl_manual/video_terms3.html

¹⁹ Calhoun, “Progress Committee Report for 1961,” 333.

²⁰ Helmut Haas, “Optacord 500—einBildbandgerät für das industrielle Fernsehen.”

²¹ In the original German: *Ein/Aus, Halt, Umspulen (Regelbar), Aufnahme, and Wiedergabe.*

however, allowing the user to move slowly and does allow for a standing image to stay on screen for a few seconds, offering a primitive Pause function.²²

Optacord 600: An Early Attempt at Home Video

In 1965, less than four years after unveiling the Optacord 500, Loewe introduced the Optacord 600. Although based on their initial Optacord 500 design, the Optacord 600 was much smaller and lighter, leading Loewe to market it as the next step in video technology: the home video recorder. Although its technical design in many ways followed on that of its predecessor, in all outward appearances, the Optacord 600 was a whole different video recorder for a whole different market.

Today the Optacord 500 is more likely to be mentioned (however briefly) in histories of video technology, due largely to its status as the first European video recorder. Not having status as a historical “first,” the Optacord 600 is seldom mentioned today, not even on the Loewe website, which showcases the 500 as a major achievement. Yet far more Optacord 600s were manufactured and purchased, over a longer period of time. Later models with slight improvements (the Optacord 601, 602, 603, and 650) would be released throughout the course of the 1960s, until the arrival of the wholly new Optacord 700 in 1971.²³ In terms of the market, in its day, the Optacord 600 was the greater success. Perhaps it should be remembered alongside its predecessor, as it represents a fascinating, if not wholly successful, early attempt at imagining home video, a concept still foreign to many people at the time.

²² Haas, “Optacord 500—einBildbandgerät für das industrielle Fernsehen.”

²³ Richard N. Diehl, “Extinct Loewe Opta Equipment,” accessed November 20, 2013, http://www.labguysworld.com/Cat_LoeweOpta.htm

Unlike the Optacord 500, which was over 3 feet tall and weighed almost 278 pounds, the Optacord 600 is small enough to be housed in a carrying case and weighs between a sixth and an eighth of what its predecessor weighed: 15 kg (33 pounds) on its own, 20 kg (44 pounds) when housed in its carrying case. Although rather heavy to carry, carrying the Optacord 600 is at least feasible. On its own, the Optacord 600 measures 50 centimeters (approximately 19.5 inches) tall, with a width of 39 centimeters (approximately 15 inches) and a depth of 19 centimeters (approximately 7.5 inches). In its carrying case, it measures 52 centimeters (approximately 20.5 inches) tall, with a width of 41 centimeters (approximately 16 inches) and a depth of 22 centimeters (approximately 8.5 inches). It is a mark of how rapidly video technology was advancing in the early 1960s that, when the Optacord 500 came out in 1961, it was a remarkably portable, lightweight machine at nearly 278 pounds, while barely more than three years later, this 33 pound machine would be on the market.

The most fascinating aspect of the Optacord 600 may be the ways in which its unique design and its bold marketing campaign sought to make it the revolutionary video recorder that would usher in the home video age. The most striking (and clever) aspect of the design for the Optacord 600 is that it was available either built into a carrying case with a handle or installed into a home entertainment center, television, or monitor of some kind. The marketing materials for the Optacord 600 play up this aspect of its design, showing the different uses and looks the machine could take on (Figure 3). The biggest, most lavish picture, however, is of the video recorder installed in a home entertainment center, of the kind popular in the early to mid-1960s, again underscoring

the potential for this machine to bring video recording into the home. There is something irresistibly fun and appealing in this clever consumerist idea of a design-your-own VTR.

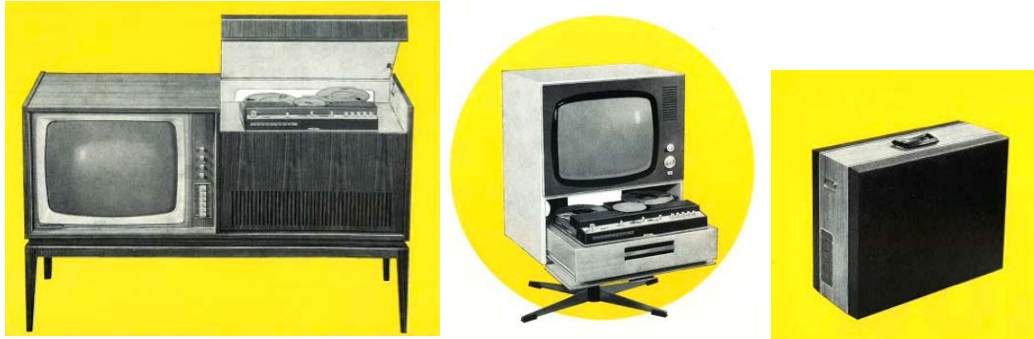


Figure 3. Different Optacord 600 Configurations (Loewe)

Although its magazine photoshoot cover of a model showing off the home entertainment center configuration of the Optacord 600 stresses the home video use of the machine, on the inside, the brochure for the 600 makes sure to innumerate the many commercial and industrial uses this more portable and lightweight video recorder can fulfill. In addition to recreational use in the home, Loewe suggests its usefulness for: Trade and Industry; Education; Science; Medicine; Theater, Film, and Television; the Press; Advertising; Sports; the Police; the Military; and Air Traffic Control.²⁴ The Optacord 500 was used mainly by the television industry, in education, and by the military. Certainly, in marketing a smaller, more versatile VTR for the home, Loewe would not want to lose such potentially lucrative customers.

Certainly any of these fields would benefit from more portable, affordable video recorders. Particularly intriguing is the entry for Theater, Film, and Television. Loewe

²⁴Loewe, "Optacord 600."

suggests actors, singers, and directors use the Optacord 600 for rehearsals, making scene studies easier by recording and playing back rehearsals or comparing rehearsals to filmed scenes or previously videotaped footage. Indeed, an article would later appear in a 1967 issue of UK entertainment industry weekly, *The Stage and Television Today* (now *The Stage*), featuring the Optacord 600 and suggesting its use by actors for studying their scenes at home.²⁵ (Anecdotal evidence from collectors suggests that, outside of West Germany, the Optacord 600 really only took hold in the UK,²⁶ where Loewe equipment was distributed by Highgate Acoustics.)²⁷

One of the most intriguing aspects of the way in which Loewe sought to introduce the concept of the home video recorder was in what it largely failed to mention: the ability the Optacord 600 could potentially offer the consumer to record TV programs. Certainly to anyone today, this would seem like the most obvious, even the primary, feature of home video. Over a decade before the beginnings of litigation like the famous Sony Betamax case, which eventually brought a US Supreme Court ruling in favor of the right to record individual copies of TV shows for the purposes of time shifting, this idea might have been a dim to nonexistent concept for many people. Strangely, the Optacord 600 brochure does bring up this issue of time shifting and recording programs off of TV, but only in the context of hospitals! The brochure states the Optacord 600 would allow for the “time appropriate presentation of television programs in hospitals.” Yet, in the context of the home, it merely suggests consumers could use the machine to record

²⁵ John Weston, “Could Study Your Performance at Home,” *The Stage and Television Today*, June 8, 1967, 11.

²⁶ Stefan Richter, email correspondence, October 15, 2013.

²⁷ John Weston, “Display by Ampex Is Fascinating Hint of Future Developments.” *The Stage and Television Today*, July 13, 1967, 10.

family get-togethers or to create “amateur TV shows” (*Amateurfernsehspielen*).²⁸

Whether Loewe simply failed to imagine the possibility that consumers might record TV shows in their homes or Loewe thought it best not to mention the possibility, the absence is surprising and intriguing.

Certainly this possibility was not lost on *Popular Science*. Reviewing the Optacord 600 in its pages, under the headline, “Spinning Head Tapes TV at Home,” *Popular Science* would ask: “Is this the year you mate a home TV tape recorder to your TV set?” Featuring a picture of the Optacord 600 installed in a home entertainment center, the magazine notes that the video recorder “can be built into a console TV for off-the-air recording.” The January 1965 article promises that the Optacord 600 would be available in the US “in a few months” for a price of “over \$2,000 with accessories.”²⁹ The *Journal of the SMPTE* listed the price at “under \$3,000, including camera and accessories.” The *Journal* similarly notes the ability to tape programs off TV: “The new recorder can be used to record programs for immediate playback over home TV sets. Also, automatic unattended recording of television programs is made possible by means of a pre-programmed switch clock, enabling the viewer to record programs of his choice when he is not at home, or to tape a program from one channel while he is watching a program on another channel.”³⁰ This brief passage in the *Journal* seems to be the only mention, in English or German, of the full time shifting possibilities just then becoming available.

²⁸Loewe, “Optacord 600.”

²⁹“Spinning Head Tapes TV at Home.” *Popular Science*, January 1965, 86.

³⁰“New Products and Developments.” *Journal of the SMPTE*, 73, no. 10 (1964): 916.

Unfortunately for any American readers of *Popular Science* or the *Journal* anxious to tape their favorite TV shows with the Optacord 600, plans to distribute the video recorder in the US apparently fell apart. The *Journal* mentions Video-Medical Electronics Corporation as the US distributor for the Optacord 600.³¹ Little information about this corporation seems available today. At any rate, it would seem that no Optacord 600 devices ever made it to the US.

Technical Specifications

An open-reel video recorder like its predecessor, the smaller Optacord 600 records onto 1-inch (25.4 mm) tape, rather than 2-inch tape. The electrical system has been transistorized, leaving the bulky vacuum tubes of the Optacord 500 behind. The Optacord 600 also starts up faster than its predecessor, needing only approximately 20 seconds to warm up after being switched on.³² Like the Optacord 500, the 600 is a one-head video recorder, with the tape wound around the head drum in an alpha wrap. Although 1-inch tape makes for a marked improvement in terms of convenience, as a video recorder marketed for the home, arguably some potential consumers might have found threading the tape by hand in an alpha wrap a challenge.

The video head on the Optacord 600 is identical to that on the Philips EL-3400 video recorder, which was released this same year. Philips had taken over a majority of the shares in Loewe in 1962, after the death of Siegmund Loewe. The Philips EL-3400 is similar in many ways to the Optacord 600. However, it was marketed exclusively for industrial and educational purposes, was somewhat bulkier, and—according to

³¹“New Products and Developments.” *Journal of the SMPTE*, 73, no. 10 (1964): 916.

³²Haas, Optacord 600, 2.

collectors—not as well crafted and reliable as the Optacord 600.³³(It also still used vacuum tubes.)³⁴The video head, which makes 3000 revolutions per minute, is noisy by later standards, as the hum on video recorded on the Optacord 600 demonstrates.

The Optacord 600 records up to one hour and twenty minutes of material onto an 8-inch reel of 1-inch tape (twenty-five minutes fewer than the Optacord 500 records onto its 2-inch tape). It records at a speed of 15 centimeters (approximately 6 inches) per second, a slower tape speed than that of the Optacord 500. The Optacord 600 retains the five prominent push buttons for major functions from its predecessor, with slightly different terminology: Rewind, Start/Playback, Stop, Record, Power.³⁵ One of its selling points, according to the marketing materials for the Optacord 600, was that it is “Push Button Easy” (*Drucktastenbedienung*). Although not marked on the push button this time, the rewind is still adjustable, allowing for fast rewind, as well as to slow the rewind till the image is paused momentarily. In fact, the Optacord 600 was marketed as having a Pause (*Stillstand*) feature. Later models, such as the Optacord 603S, do feature a Pause button (the “S” at the end of the model number standing for “Stillstand”).³⁶

A final aspect of the Optacord 600 and its construction that may be worth noting is its method of laying down a control track. According to Friedrich Sambs at the ZKM Laboratory for Antiquated Video Systems, the Optacord 600 was highly unusual in that it used bias voltage in recording the sync signal on tape. Audio tape recorders would

³³ Friedrich Sambs, ZKM Laboratory for Antiquated Video Systems, email correspondence, 15 November 2013

³⁴ Richard N. Diehl, “Extinct Philips Equipment,” LabGuy’s World, accessed November 20, 2013, http://www.labguysworld.com/Cat_Philips.htm

³⁵ In the original German: *Umspulen*, *Start (Wiedergabe)*, *Halt,Aufname*, and *Netzschalter*.

³⁶ Sambs, email correspondence, November 19, 2013

usually use AC bias voltage in recording, but this method was not generally used in video recording technology, particularly as the frequency that would be recorded for the sync signal is constant and very low. Nevertheless, in designing the Optacord 600, Loewe chose to record the sync signal through this bias voltage method typically used to record audio signals in audiotape.³⁷ Perhaps this is a reflection of the work developing audio recorders (the original members of the Optacord family) for which Loewe was long known. At any rate, this use of AC bias voltage in recording the control track seems to be a curious, anomalous feature specific to the Optacord 600.

The Optacord 600 Reconsidered

Histories of Loewe and even current news articles about Loewe, always mention the Optacord 500 as the device that secures their place in video history. Little is ever written about the more popular Optacord 600, however. An Optacord 500 is on display in at Loewe headquarters and at least one is owned by a private collector. Yet far more Optacord 600s were manufactured and are owned by collectors today. Ultimately, the Optacord 600, which in 1965 promised to “open up possibilities that until recently could hardly be imagined,” proved a little too far ahead of its time. The design and marketing of the Optacord 600 offers a glimpse of one of the earliest conceptualizations of home video, what it might look like and how it might be used. The Optacord 600 concept of making a video recorder available in a variety of different configurations seems an ingenious strategy. The cost of an Optacord 600 still made it very much a luxury item, however. Additionally, weighing in at 44 pounds in its carrying case and requiring the user to thread the 1-inch videotape by hand in an alpha wrap, the Optacord 600 was

³⁷Sambs, email correspondence, November 15, 2013.

perhaps best suited to the committed videophile. Although the Optacord 600 did enjoy modest success in Germany (and, it would seem, to a lesser extent, in the UK) there were still many years and many innovations to come before the idea of home video would really take hold of the popular imagination.

Note on Sources

For my research I have relied to a great degree on the assistance of videophiles and current and former Loewe employees. In particular, I have been helped by Dorcas Müller and Friedrich Sambs at the ZKM Laboratory for Antiquated Video Systems, Stefan Richter, a videophile and collector, and Thomas Sebald at Loewe. Very little has been written about the Optacord 500 or 600 and what has been written is not only mostly in German, but exists only in physical copies in Germany. I was only able to consult most of the technical specifications, marketing materials, and manuals on these obscure video recorders because these people took the time to scan these materials for me and email them to me. In addition, they were able to provide me with their own knowledge and experience with these Optacord models through their correspondence with me.

Annotated Bibliography

Abramson, Albert. *The History of Television, 1942-2000*. Jefferson, NC: McFarland, 2003.

The Loewe Optacord 500 and 600 are both mentioned by Abramson in his book, each receiving a paragraph and an illustration. The Abramson book is also valuable for placing these early video recorders in the context of contemporary developments in technology from rival companies, such as RCA or Philips.

Calhoun, John M. "Progress Committee Report for 1961." *Journal of the SMPTE*, 71, no. 5 (1962): 333, 351.

This report mentions the Optacord 500, as one of seven "lower cost" video recorders using the then new helical scan technology.

Diehl, Richard N. "Extinct Loewe-Opta Video Equipment." LabGuy's World. Accessed October 16, 2013. http://www.labguysworld.com/Cat_LoeweOpta.htm

Richard Diehl runs LabGuy's World, a website devoted to extinct video technology. His site features this page devoted to Loewe Opta, which includes pictures and brief descriptions of the Optacord 500, 600, and 650.

"Education, Industry News." *Journal of the SMPTE*, 73, no. 10 (1964): 896.

This article mentions Video-Medical Electronics Corporation, which distributed Loewe products in the US and was supposed to market the Optacord 600 in the US. Little seems to be known of Video-Medical Electronics and it seems unlikely that the Optacord 600 ever made it to the US market.

Fisher, David. "The Quest for Home Video." Terra Media. Accessed October 16, 2013. <http://www.terramedia.co.uk/media/video/index.htm>

On his website, David Fisher has posted "The Quest for Home Video," a chronology of early attempts at and predecessors to home video technology, from 1893 to the launch of VHS in 1978. There are pages for both the Optacord 500 and 600. The website places these products in the context of the larger development of home video. However, these brief entries do contain some factual errors.

Haas, Helmut. "Loewe Optacord 600: A Portable Tape Recorder." *Loewe OptaKurier*, 22 (1965): 2-4.

This article on the Optacord 600, by Loewe engineer Helmut Haas, appeared in German in the Loewe company publication, *Loewe OptaKurier*. A scan of a

translation into English, apparently made around the time of publication, is available from Loewe. This article offers by far the most information to be found on the Optacord 600.

—. “Optacord 500—einBildbandgerät für das industrielle Fernsehen.” *Kino-Technik*, 16 (1962): 279-281.

This article, also by Helmut Haas, similarly offers the most information available about the Optacord 500. Never translated, it only exists in German. A copy is available from Loewe.

Loewe Opta. *Optacord 600*. Kronach, Germany: Loewe Opta, 1965.

This brochure (in German) for the Optacord 600, which offers an immensely valuable view of how the recorder was marketed, as well as technical information.

“Loewe Video Recorder Optacord 500 Demo Film.” YouTube video, 4:28. Posted by Stefan Richter, September 30, 2011. Accessed October 16, 2013.
<http://youtu.be/U8-Y-T-Tjus>

Stefan Richter has posted this 16mm film demonstration of the Optacord 500 at the 1961 Internationale Funkausstellung Berlin (IFA) to his YouTube channel. It offers a rare glimpse of the 500 in use. Richter is a videophile and collector, who once owned both the 500 and the 603S, and has also discussed these models with former Loewe employees who worked on them.

Magnetbandmuseum. “Loewe-Opta 500/600.” Accessed October 16, 2013.
<http://www.magnetbandmuseum.info/loewe-opta-500-600.html>

Magnetbandmuseum is a German website covering vintage magnetic tape video technology. This page features a large amount of technical information and pictures of the Optacord 500 and 600 (in German).

“New Products and Developments.” *Journal of the SMPTE*, 73, no. 10 (1964): 916.

This article includes a picture and three paragraphs describing the Optacord 600. Video-Medical Electronics Corporation is mentioned as the future US distributor, although this seems not to have come to pass. The US price, according to the article, will be \$3000, as opposed to the \$2000 figure claimed in *Popular Mechanics* (see “Spinning Heads,” below).

“Optacord 500 – A Videotape Unit for Industrial Television.” *British Kinematography* 42, no. 2 (1963): 62.

This Brief paragraph describes the Optacord 500 and is abstracted from a German technical journal article.

Putman, Richard E. "Progress Committee Report for 1964." *Journal of the SMPTE*, 74, no. 5 (1965): 386.

This report mentions a demonstration of the Optacord 600 prototype, along with other prototype low cost recorders from rival manufacturers.

Radiomuseum. "Optacord 500." Accessed October 16, 2013.

http://www.radiomuseum.org/r/loewe_opta_optacord_500.html

—. "Optacord 600." Accessed October 16, 2013.

http://www.radiomuseum.org/r/loewe_opta_optacord_600.html

Radiomuseum is a website and forum devoted to vintage electronics. There are pages on the site for the Optacord 500 and 600, with pictures and technical specs, as well as comments by users. Hans Stellmacher, who maintains the Radiomuseum website, is also a source for questions about this kind of equipment.

Secunda, Eugene. "VCRs and Viewer Control Over Programming: An Historical Perspective." In *Social and Cultural Aspects of VCR Use*. Edited by Julia R. Dobrow. Psychology Press, 1990. 9-24.

Secunda provides an overview of the development of home video technology and its implications for viewer control, from early Ampex recorders to the Sony Betamax case. Loewe is mentioned among the companies developing the earliest home video technology in the mid-60s.

"Spinning Head Tapes TV at Home." *Popular Science*, January 1965, 86.

This is one of the few English-language articles about the Optacord 600. Appearing in *Popular Science* in 1965, the article features pictures of the Optacord 600, which it promises will soon be available on the market in the US for \$2000 (something that seems to have never come to pass). The brief article compares the Optacord 600 with the very similar Philips EL-3400 and offers a glimpse of how the Optacord 600 might have been marketed in the US, including presenting the VTR as a way to record TV programs in the home for the purposes of time shifting, an issue that would not fully enter public consciousness for perhaps another decade.

Weston, John. "Could Study Your Performance at Home." *The Stage and Television Today*, June 8, 1967, 11.

—. "Display by Ampex Is Fascinating Hint of Future Developments." *The Stage and Television Today*, July 13, 1967, 10.

These articles both discuss the Optacord 600 as the first video recorder developed for private use and suggest that it also is well-suited to educational use. The June article also suggests the Optacord 600 for use by actors in studying their performance technique in the privacy of their own homes and offers information about how to obtain one in the UK. The second article focuses on Ampex, but devotes a paragraph to their competitors, Sony and Loewe, mentioning the Optacord 600.

ZKM Laboratory for Antiquated Video Systems. Accessed November 20, 2013.
<http://on1.zkm.de/zkm/>

The ZKM Laboratory for Antiquated Video Systems, founded in 2004, is a unique research facility dedicated to the study, restoration, preservation, and archival storage of obsolete video technology, focusing particularly on the issue of endangered video art. Their website does not have any information about the Optacord 500 or 600, but Dorcas Müller and Friedrich Sambs (who owns an Optacord 600) at ZKM are invaluable resources for technical information about these devices.