

Moving Image and Sounds:
Basic Issues and Training
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Pictures by Wire

Today, news travel across continents not in a matter of hours but a matter of seconds. Anyone with access to the internet and a personal device has access to information and instantaneous communication. These privileges are the norm and part of who we are as a society. We expect the latest news as they are happening, and we expect videos and pictures along with our news. Otherwise, we feel compelled to question the validity of the information, or our attention may be diverted to something else. It's hard to imagine, but there used to be a time when the world moved at a slower pace. A time when news could only travel as fast as the mail carriers could, instantaneous communication could only happen with those physically near us, and information was altogether less accessible. Despite the limitations, human ingenuity prevailed and developed more efficient mechanisms to communicate more efficiently.

The telegraph, the telephone, and the radio are some of those "ancient" mechanisms that today seem outdated but helped shape how we communicate with the world around us. Another important, less known device is the wirephoto, which made sharing photographs across distances possible for the first time. The wirephoto led to a revolution in news consumption and the beginning of photojournalism, effectively shaping how we consume news today. The wirephoto was unmatched at its time and was in use from 1935 to the '70s. Before taking a look at the wirephoto, we will have to take a step back further in history and look at the technological advances that paved the road for this format's success: the teliagraph and the belinograph

Invented by Ernest A. Hummel in 1895, the telediagraph was the first device to transfer images successfully¹. This format used the telegraph's infrastructure and its basic concept of transmission using electricity to function. It was made up of two separate devices, a transmitter, and a receiver, placed in the same room or miles apart. Both the transmitter and the receiver had an 8-inch drum and a platinum stylus. The only two requirements for the transfer to be successful, was for the two machines to create a circuit and be synchronized to move at the same speed. The loss of synchronization would result in failure of transmission.²

The process began by drawing the image on a 6x8 sheet of tin foil, using non-conductive ink made of shellac and alcohol³; the tin foil sheet would then be wrapped around the transmitter's drum. As the drum would begin to rotate, the platinum stylus would come in contact with the tin foil to create a circuit. Whenever the stylus would reach the non-conductive ink, the circuit would be disrupted and forced to travel to the receiving end to close⁴. When the circuit would close at the receiving end, the stylus would come in contact with the receiver's drum; at this stage, the stylus would begin to "draw" the image. The receiver's drum would be wrapped in paper with a carbon paper interleaf.⁵

The telediagraph's technology was not revolutionary; in fact, similar machines existed before this one. It was the synchronization of the drums used in the transmitter and receiver devices that was innovative and accounted for this format's success. According to an article by the Boston Herald, "the cylinders are turned by clockwork, and this is run not by electricity directly but by weights, as ensuring greater accuracy than direct electrical control."⁶ In addition to the clockwork used for synchronization, the receiving drum would stop after every completed revolution and wait for the transmitter to send

¹Cook, Charles Emerson. "Pictures by Telegraph."

² Cook, Charles Emerson. "Pictures by Telegraph."

³Rensen, Marius, "Hummel's Telediagraph, 1898"

⁴Cook, Charles Emerson. "Pictures by Telegraph."

⁵Rensen, Marius. "Hummel's Telediagraph, 1898"

⁶"Newspaper Illustrations sent by Wire." Boston Herald.

asynchronization in the form of an electric impulse controlled by automatic switches on the transmitter machine.⁷ Using Hummel's clockwork and the electric synchronization impulse at the end of every revolution, it was possible for the two devices to eventually find perfect synchronization even if they were turned on at different times.

The first image, "the first gun fired at Manila,"⁸ was sent from the *New York Herald* to the *Chicago Times Herald*, the *St. Louis Republic*, the *Boston Herald*, and the *Philadelphia Inquirer*. Transferring this image took only 20 minutes, but it could typically take anywhere from 20 minutes to 40 minutes, depending on the complexity of the image. The telediagraph machines were installed in 6 offices of American newspapers on a 24-month contract.⁹ After the initial 24-months, the telediagraph became available for anyone to purchase. Despite the cost being similar to that of the telegraph machine¹⁰, there is little evidence to prove the telediagraph format was commercially successful or even acquired by other newspapers. Likewise, there is no evidence the format was ever standardized or that an American telediagraph machine was ever used overseas.

For preservation concerns, carbon copies, in general, are relatively stable but still highly dependent on their storage environment. Their preservation requires a cool and dry storage environment (below 50 degrees Fahrenheit and 35%-50% RH) and proper storage in acid-free and lignin-free folders.¹¹ Original telediagraph copies may still exist and may still be preserved for future generations if the appropriate steps are taken. However, the likelihood of any original copies available is small since the images would be touched up and enhanced before they were published on the paper. The images below, taken from the article in Pearson's Magazine, "Pictures by Telegraph," show the process of transmitting an image using the telediagraph.

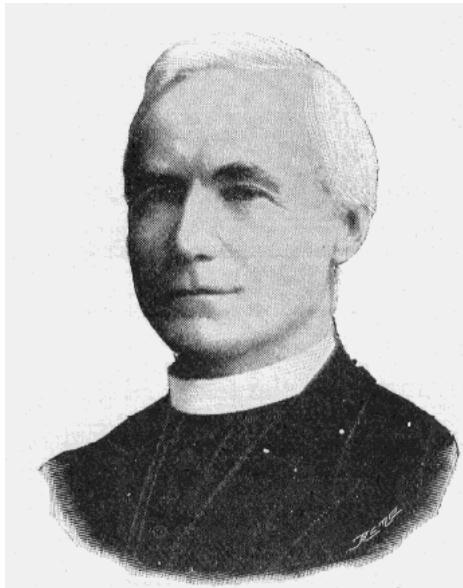
⁷Boston Herald. "Newspaper Illustrations sent by Wire."

⁸Cook, Charles Emerson. "Pictures by Telegraph"

⁹Times Herald. "This Week in History" Times Herald.

¹⁰Cook, Charles Emerson. "Pictures by Telegraph"

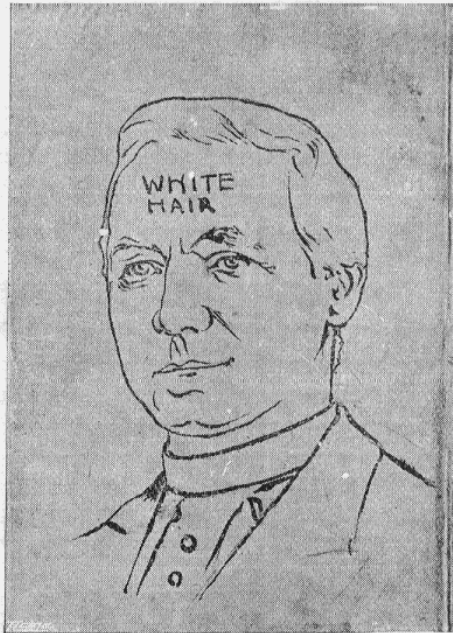
¹¹Preservation Self-Assessment Program. "Carbon Copies"



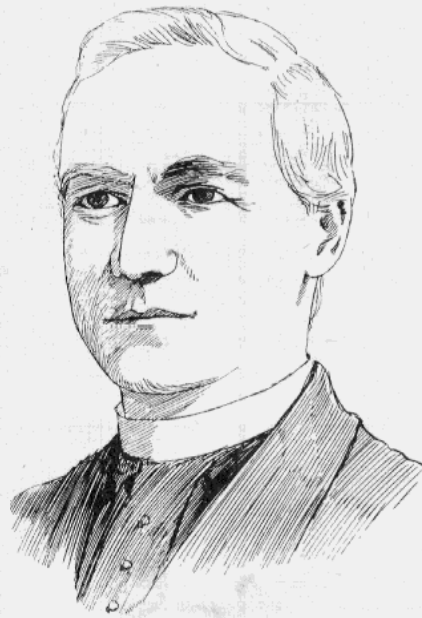
1. The original photograph of the Rev. Father Mockin, who married Admiral Dewey to Mrs. Hogan.



2. The sketch on tin-foil which was bent round the cylinder of the transmitter at Washington.



3. The sketch as it came out of the receiver at New York.



4. The finished sketch as reproduced in the *New York Herald*.

The telediagram was the first step in incorporating images along with the news. It's important to keep in mind that the telediagram transferred

simple images, not pictures. The images would be hand-drawn and did not involve any photographic processes. Despite this, the telediagraph was the first device to establish itself among newspapers in the United States and take the first step towards the widespread use of images alongside news stories.

Following Hummel's telediagraph came the belinograph, invented by the Frenchman Edouard Belin in 1907. Using the belinograph, Belin made the first transmission of a photograph. Like the telediagraph, this device used telegraph lines first but later moved to telephone lines, and eventually radio waves¹². This equipment was different than the telediagraph in a few ways. Still, its foundation consisted of the same principle as the telegraph and the telediagraph, using electric pulses to transfer information. Like the telediagraph, the belinograph consisted of a transmitter and a receiver machine; both were synchronized, but instead of clockwork, through a pendulum. Another difference was that the receiving machine had to be located in a dark room since the image was received on photographic paper.¹³

The process involved printing through a negative film with light on to a carbon-gelatin-bichromated paper. The gelatin covering the dark areas on the paper would swell when developed, while the gelatin on the light areas remained flat. This print would then be transferred to a brass transmitting cylinder and allowed to dry. Once dry, the light and dark areas would create a five thousandth of an inch relief on the brass cylinder, which would then be used in the transmitting machine.¹⁴ Once the transmission began, a stylus would gently come in contact with the rotating cylinder. The relief on the cylinder was analyzed by the stylus and converted into an electrical signal. This signal was then decoded and converted to light at the receiving end. A latent image would be created on the photographic paper at the receiver and developed to create a belinograph copy of the original photograph.¹⁵

¹²Know-More. "Do you know what a belinograph is?"

¹³The Graphic. "A 'Picture-telegram' Service for China: THE WONDERS OF BELINOGRAPHY

¹⁴Rensen, Marius. "Belin"

¹⁵Know-More. "Do you know what a belinograph is?"

Because the belinograph used photographic paper in its transferring process, the existence of original materials is even less likely than telediagraph original materials. Photographic materials are known to be highly sensitive to light and changes in temperature and humidity. Additionally, there is no reason to believe the type of photographic paper used or the developing processes were ever standardized, making the preservation of these materials even more complicated. In general, any exiting originals should be kept in a dark, cool, and dry environment and may even need more intricate preservation treatments.

The belinograph made its first transmission from Paris to Lyon in 1907, and by 1921 it made its first transatlantic transmission, between Annapolis MD and Belin's laboratory in France. The belinograph was adopted in Britain during the late 1920s and was used almost exclusively in Europe during the 1930s and 1940s. France saw use in the device to help identify criminals by using fingerprint photographs that could be shared between France's major cities¹⁶. The belinograph continued to be improved, and in 1927 the introduction of a photocell to analyze the original photograph improved the quality of the image and the transmission speeds. By 1933 and on the belinograph could fit in a suitcase and weighed around 65 lbs.¹⁷

Thanks to the advancements made by telediagraph and the belinograph, the technology for the wirephoto was developed by different companies around the same time! In 1921, for example, Western Union introduced its halftone photograph, and in 1926 RCA sent the first "radio photo." Even though these systems all had slight differences, they all relied on the principles set by their ancestors; converting images into electric impulses and using existing infrastructure to transfer them to a receiving end.

The wirephoto machine required two cinchonized devices, a transmitter and a receiver. Instead of a stylus, the wirephoto used a photocell to analyze the original photograph and convert it to electric impulses. Because the

¹⁶Negro World. "Paris Establishes a Belinograph Post"

¹⁷Know-More. "Do you know what a belinograph is?"

wirephoto used light and photographic paper to transfer photographs, both the transmitter and receiver cylinders were enclosed in light proof cases. The process involved the photograph being placed inside a transmitting machine and wrapped about the transmitting cylinder. The image would be scanned by a photocell and translated into electric impulses. The impulses would travel over a telephone line and reach the receiving end, where they would be decoded back to light, which would be exposed onto photographic paper¹⁸. The negative created by the receiver would later be developed to create the photograph.

The wirephoto service was introduced in 1935 by the Associated Press and was incredibly expensive for the time. AP leased telephone lines from AT&T to ensure reliability of the system; the price was \$56/mile a year for about 100,000 miles of telephone lines, and 25 wirephoto machines at \$16,000 each to be distributed across the country. ¹⁹Despite this, the AP wirephoto became an instant success and remained in use until the 1970s.

For the first time, news could be streamlined. The same picture could be shared with thousands of people in different parts of the country at the same time. Because of the wirephoto, people began to expect pictures along with their new stories, and eventually, pictures themselves started to gain importance. Photographs no longer needed to be attached to a story to have relevance; they could be the story. In this way, many photographs gained international recognition. Some notable examples include “Raising the Flag on Iwo Jima,” “The Hindenburg Disaster,” and “A Man on the Moon.” It’s worth noting that all wirephotos started first as regular photos. There are no famous wirephoto original works because this format was used to disseminate, not create.

The simple process of transmitting electric pulses, which would be decoded continued to evolve. Today the telediagraph, the belinograph, and the wirephoto are often listed as ancestors to the fax machine. A demand for better image quality eventually led the demise of these formats. The wirephoto was

¹⁸Cycleback, David. “Photos Through the Telephone: A History and Guide to Wirephotos.”

¹⁹Coopersmith, Jonathan. “From Lemons to Lemonade: The Development of the AP Wirephoto.”

eventually replaced by the laserphoto, a device similar to the wirephoto that used lasers to read and decode information. The laserphoto promised improved sharpness and resolution of the transmitter picture.²⁰ Today we are, in a sense, desensitized to images. Not only are they part of every newspaper and magazine, but we can create our images and share them among our friends and family without the need for a bulky device. Ultimately, we have the wirephoto to thank for being one of the first to fulfill our need share images with each other.

Annotated Bibliography

AP Images Spotlight. "85 Years of Wirephoto." Accessed November 11, 2020. <https://apimagesblog.com/historical/2019/12/12/85-years-of-wirephoto>.

²⁰New York Times. "AP to Introduce Laserphoto in '74"

“85 Years of Wirephoto” celebrates the 85th anniversary of the AP wirephoto service. It looks at the general history of the wirephoto, how it worked, and its impact on AP. I used this resource to help me understand better how the mechanics of the wirephoto worked.

“AP to Introduce Laserphoto in '74.” *New York Times*, April 23, 1973.

Cook, Charles Emerson. “Pictures By Telegraph.” Accessed September 30, 2020. <http://www.forgottenfutures.co.uk/fax/fax.htm>.

This article, published in April of 1900, explains the telediagraph as a new technology used to transfer images between locations. This was one of the only sources I could find, which explained in detail how the device worked.

Coopersmith, Jonathan. “From Lemons to Lemonade: The Development of AP Wirephoto.” *American Journalism* 17, no. 4 (October 2000): 55–72. <https://doi.org/10.1080/08821127.2000.10739270>.

I used this source to get a detailed history of AP’s introduction of the wirephoto in 1935. This article lays out information on cost, bureaucratic procedures, and the mechanics of how the AP Wirephoto worked

Cycleback, David. “A Guide to Wirephotos.” *Sports Collectors Daily*. Sports Collectors Daily, May 4, 2018. <https://www.sportscollectorsdaily.com/photos-telephone-history-guide-wirephotos/>.

The Editors of the Encyclopedia Britannica. “Édouard Belin.” *Edouard Belin*. Encyclopædia Britannica, inc., March 1, 2020. <https://www.britannica.com/biography/Edouard-Belin>.

Used the Encyclopedia Britannica for preliminary facts about Edouard Belin and his invention, The Belinograph.

“Paris Established a Belinograph Post” *Negro World* (New York, New York), August 7, 1926: 3. NewsBank: Access World News – Historical and Current.

Short piece on the introduction of the belinograph in French police stations with the purpose of identifying criminals.

“Newspaper Illustrations sent by Wire” *Boston Herald* (Boston, Massachusetts), April 23, 1988: 40. *Readex: America’s Historical Newspapers*. <https://infoweb-newsbank-com.proxy.library.nyu.edu/apps/readex/doc?p=EANX&docref=image/v2%3A1386BF60B4F67060%40EANX-13A57E19A266D198%402414768-1399EA3CB063D3EC%4039-1399EA3CB063D3EC%40>.

This source turned out to be the most detail specific description of the telediagraph. It allowed me to understand how the synchronization of the drums happens. This source also suggested some potential pros and cons for this format.

Know-More. Do you know what a belinograph is? Blogger, June 15, 2020.
<https://rd-more.iqraaelmazid.com/2020/06/do-you-know-what-belinograph-is.html>.

“Preservation Self-Assessment Program.” Preservation Self-Assessment Program (PSAP) | Office Printing and Reprography. Accessed November 29, 2020. <https://psap.library.illinois.edu/collection-id-guide/officeprintcopy>.

The preservation Self-Assessment Program describes different materials, potential deterioration, and preservation processes for those materials. I used this source to understand the preservation of carbon copies made with the telediagraph.

Rensen, Marius. “Hummel's Telediagraph, 1898.” History. Accessed November 9, 2020. <http://www.hffax.de/history/html/hummel.html>.

This website was dedicated to the history of the fax machine and went into specifics of each format that came before the fax machine. I used this website for more information on how the mechanics of the telediagraph and the belinograph worked.

Rensen, Marius. “Belin.” History. Accessed November 29, 2020. <http://www.hffax.de/history/html/belin.html>

I used this website a second time to find out more about the belinograph. This was one of the only sources I found that explained the mechanics of the belinograph in detail.

“A ‘Picture-Telegram’ Service for China: THE WONDERS OF BELINOGRAPHY.” *The Graphic*. December 25, 1926, 114 edition. British Periodicals. <https://search-proquest-com.proxy.library.nyu.edu/britishperiodicals/docview/1693096805/CF468681C247414FPQ/1?accountid=12768>

Rowland, Marcus L. “The Dead Medium: Hummel’s Telediagraph.” The Dead Media Project: Working Notes: 27.9. Accessed September 30, 2020. <http://www.deadmedia.org/notes/27/279.html>.

This is the first website I visited in my preliminary research. This website gave me some ideas on how to move forward with my research.

“THIS WEEK IN HISTORY.” *Times Press*(Hartford, Wisconsin), May 1, 2016: 11.
NewsBank: Access World News – *Historical and Current*. <https://infoweb-newsbank-com.proxy.library.nyu.edu/apps/news/document-view?p=WORLDNEWS&docref=news/15C8B222526F9AC0>.

This newspaper article was the only source of information I was able to find relating to the commerciality of the telediagraph.