



02.1992.1 Home of Philo T. Farnsworth
Allen County
Marker Text Review Report
01/02/14

Marker Text

Home 1948-1967 of Farnsworth, inventor of television. Farnsworth (1906-1971) was instrumental in perfecting the image formation mechanism which enabled the first effective image transmission in 1927. Farnsworth Radio and Television Corporation in Fort Wayne 1938-1949.

Report

The marker text is generally correct, but requires context to illuminate Philo Farnsworth's scientific contributions and groundbreaking electronic concepts. It should be noted that the marker text incorrectly refers to Farnsworth's company as the Farnsworth Radio and Television Corporation. Farnsworth named the company the Farnsworth Television and Radio Corporation (FTRC).¹ Additionally, the marker omits Farnsworth's research and manufacturing activities in Fort Wayne *after* 1949, when the FTRC became a subsidiary of the International Telephone and Telegraph Company (ITT) that year. Also omitted is the fact that the Farnsworths lived in Fort Wayne *prior* to 1948, although at a different address. This review provides information about the establishment of the Fort Wayne company and its post-subsidary efforts; Farnsworth's electronic television system from conceptualization to commercialization; and biographical information about the inventor.

Farnsworth was born August 19, 1906 in Beaver County, Utah, and grew up in the west prior to the existence of power lines.² He moved to Rigby, Idaho in 1919, where he was "overjoyed" to discover that the family ranch had a Delco power system, as well as a plethora of scientific magazines.³ Here he read and taught himself scientific concepts, inventing tools that facilitated household chores.⁴ Although sources differ regarding the year, Farnsworth's wife, Elma "Pem" Farnsworth, states that in 1921, at the age of 14, Philo conceived of the idea to transmit images electronically.⁵ At that time, scientists and inventors experimented with mechanical image systems, which required cumbersome moving parts, like the Nipklow spinning disk, to project images.⁶ After teaching himself about electrons using scientific magazines, Farnsworth envisioned ways to utilize them to supplant mechanical television devices.⁷

According to Elma, while working on the family farm, Philo observed the straight rows created by the horses as he plowed, and abruptly thought "he could build the image like a page of print and paint the image line after line . . . with the speed of the electron, this could be done so rapidly the eye would view it as a solid picture."⁸ After finding Farnsworth's [image dissector tube sketched](#) on the classroom blackboard, Farnsworth's high school chemistry teacher, Justin Tolman, convinced Farnsworth that his idea was viable.⁹ This novel method harnessed "electrons to dissect an image into small bits, transmit these bits through the air, and reassemble the bits to provide a picture on a cathode ray tube at the receiver."¹⁰



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In 1923, Farnsworth moved to Provo, Utah and pursued formal education, enrolling at Brigham Young University (BYU) to study mathematics and physics, although he never graduated.¹¹ After leaving BYU, Farnsworth worked for George Everson as an organizer at the Community Chest Campaign.¹² Upon hearing Farnsworth's ideas for electronic television, Everson and fundraiser Leslie Gorrell financially backed him and in 1926 Farnsworth established a laboratory in Los Angeles, California, and eventually San Francisco, to build his first image dissector, or camera tube.¹³ The marker text correctly states that Farnsworth achieved his first effective image transmission in 1927, although the "image formation mechanism" referenced in the marker is technically known as the Image Dissector.¹⁴

On September 27, 1927, Farnsworth transmitted an "electronic television image" of a black line, becoming the "first to form and manipulate an electron beam, and that accomplishment represents a quantum leap in human knowledge that is still in use today."¹⁵ Farnsworth explained to investors that the image was broken into thousands of elements, which were converted to electrical charges and "amplified and transmitted to a receiver," then reassembled into their "original light values."¹⁶

He filed for a patent for his [electric oscillation system](#) and [television system](#) on January 7, 1927, holding over 120 patents before his death.¹⁷ To his investors' chagrin, Farnsworth refined his television system for years before producing a saleable set.¹⁸ In 1934, he held the first public demonstration of his television system at the Franklin Institute in Philadelphia.¹⁹ Farnsworth continuously struggled to find a balance between scientific experimentation and satisfying his investors with commercial products. This pressure taxed his health, as did an ongoing legal struggle against the mammoth RCA Corporation that filed suit against Farnsworth in the hopes of introducing commercial television.²⁰ RCA employee Dr. Vladimir Zworykin claimed he should be awarded patent priority because he applied for an electronic television patent in 1923, despite lacking proof that it worked.²¹ After years of legal battles against RCA, the U.S. Patent Office awarded Farnsworth priority of invention in 1935 for his television system after Tolman presented Farnsworth's 1921 high school sketch as evidence of its feasibility.²²

In 1938, Farnsworth's investors began "to press for ending the experimental phase and getting into commercial production" and searched for a plant to produce television equipment.²³ Although the marker text states that the FTRC operated in Fort Wayne in 1938, city directories show no record of its existence until 1939, and secondary sources distinguish that while organized in 1938, the company did not move to Fort Wayne until 1939.²⁴ On March 1, 1939, the investors officially organized the Farnsworth Television and Radio Corporation.²⁵ Farnsworth's Philadelphia-based company purchased the Capehart Company plant in Fort Wayne, manufacturer of phonographs and jukeboxes, and opened for business on March 14, 1939.²⁶

Because the FCC had yet to permit spectrum space for television broadcasting, Farnsworth reasoned that "perhaps our only course was to enter radio manufacturing ourselves. This would not only



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provide a shipping room door and a new source of revenue but would put us in an advantageous position to convert to television sets when the time came.”²⁷ The [FTRC](#) manufactured radios, television equipment like the Image Dissector, and Capehart phonograph-radios and records changers.²⁸ In addition to production, Farnsworth continued to research, engineer and experiment at his Fort Wayne lab.²⁹ The FTRC eventually operated seven plants in Indiana, including those in Bluffton, Huntington and Marion.³⁰ Farnsworth also purchased local Fort Wayne radio station WGL for television broadcasting purposes, establishing the Farnsworth Radio Center in Fort Wayne.³¹

World War II forestalled Farnsworth’s goal to commercialize television, as President Franklin Delano Roosevelt required all raw television and radio materials be used in the manufacture of military products.³² Farnsworth converted his plants to the “production of military equipment and engineering channeled to [the] development of radio communication, missile guidance, and radar systems.”³³ The diversion of resources to the war effort, along with the FCC’s reluctance to establish “standards and allocate broadcast channels” impeded Farnsworth’s efforts to deliver television to the public.³⁴

The inability to bring television full-circle devastated Farnsworth and “disenchanted with television, and fearing that his patents would expire soon, he left Fort Wayne and moved to the farm in Maine to pursue his research interests.”³⁵ Thus, while the marker correctly identifies the home of Farnsworth from 1948 to 1967, it should be noted that he lived alternately between Fort Wayne and Brownfield, Maine during the period.³⁶ Additionally, the marker fails to mention that the Farnsworths lived in Fort Wayne *prior* to 1948. In 1940, the family lived in Fort Wayne, moved to Maine shortly thereafter, and moved back to Fort Wayne to the marker site in 1948 to try to revive the financially struggling company.³⁷

Unable to repay loans that allowed the company to expand during the war, Farnsworth sold the FTRC to the International Telephone and Telegraph Company in 1949.³⁸ Although the FTRC became a subsidiary of ITT and no longer appeared on the New York Stock Exchange, the Fort Wayne plant continued to make television receivers and complete Air Force contracts.³⁹ Farnsworth’s post-subsidary research at his Fort Wayne lab involved attempting to control fusion to create an inexpensive and unlimited form of energy.⁴⁰ According to biographer Paul Schatzkin, with the invention of his “fusion reaction tube” called the [Fusor](#), he sustained a fusion reaction longer than most, potentially all, scientists in the 20th century.⁴¹

In 1966, Farnsworth moved to Provo, Utah, forming Philo T. Farnsworth Associates and partnering with BYU to experiment with fusion.⁴² That same year he retired from ITT for medical reasons.⁴³ According to Elma, the family traveled to Fort Wayne for the last time in 1967 to list their house, and the Fort Wayne fusion group moved to Utah.⁴⁴ Shortly after this, Farnsworth’s health failed and he cancelled the fusion project.⁴⁵ Farnsworth passed away March 11, 1971 in Salt Lake City.⁴⁶



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Further Reading

The Philo T. and Elma G. Farnsworth Papers are located at the [J. Willard Marriott Archives](#). The archives provide [digitized images](#) of Farnsworth in the lab and with family and staff. Information about the Papers of George Everson, documenting his work with Farnsworth, can be found at the [Arizona Archives Online](#).

George Everson's [The Story of Television](#) presents an account of Farnsworth's early lab work and initial television experiments. The book should be read with caution, as it omits important events in the development of television.

[Farnovision.com](#) informs readers about Farnsworth's legacy and cultural references to his work.

For a list of Farnsworth's patents, see the Appendix in Elma Farnsworth's *Distant Vision*, and to learn about his other inventions, see pages 174, 259 and 266.

For contextual information about the struggle for television, see the Indiana Historical Society's [O'Hara RCA Thompson Company Collection](#), M962, particularly Box 1 and 105.

¹ *R.L. Polk & Co.'s Fort Wayne (Allen County, Ind.) Directory, 1938-1939* (Detroit: R. L. Polk and Co. Publishers, 1939) 194, City Directories of the United States, Fort Wayne, IN, 1938-1939, accessed Indiana State Library microfilm.; "New Television Company: Farnsworth Concern Proposes Plan to Its Stockholders," *New York Times*, December 22, 1938, accessed ProQuest Historical Newspapers: The New York Times (accessed December 13, 2013).

Paul Schatzkin, *The Boy Who Invented Television: A Story of Inspiration, Persistence and Quiet Passion* (Silver Spring, MD: TeamCom Books, 2002): 210. Schatzkin interviewed the Farnsworth family and worked with them over several years to increase recognition of Farnsworth's accomplishments.

R. Donald Sinish, "Philo T. Farnsworth: 'Gentle Genius'" (Quest Club, November 5, 1999):1, accessed from the Allen County Public Library Digital Collections, <http://cdm16089.contentdm.oclc.org/cdm/ref/collection/p16089coll2/id/23792>). Sinish worked for the FTTC's Production Engineering Department in the 1940s and his article provides both a biography of Farnsworth and recollections working with him. Sinish states "I soon learned that you didn't work FOR Farnsworth: You worked WITH him . . . His group of scientists, engineers, and technicians worked as a harmonious entity with no regard to rank or title. What was important was what you were contributing to the project" (17).



Elma G. Farnsworth, *Distant Vision: Romance and Discovery on an Invisible Frontier: The Life of Philo Taylor Farnsworth 'Father of Television,'* (Salt Lake City: PemberlyKent Publishers, Inc., 1990): 232. Elma "Pem" Farnsworth, Philo's wife, worked for Philo in his lab and witnessed his many experiments, business endeavors and the creation of electronic television. Often memoirs or recollections are concerned with representing subjects in a positive light to the detriment of facts. However, Elma thoroughly researched and references newspaper clippings, scientific magazines and Philo's personal journal to compile the book. She presents his successes, as well as his struggles and failures. According to Elma, Philo requested that she be significantly involved in any biography written about him because he considered himself and Elma to be "one person."

² For information related to Farnsworth's birth, see "U.S., Social Security Index, 1935-Current," *AncestryLibrary.com* (accessed November 25, 2013).; "Utah Cemetery Inventory," *AncestryLibrary.com* (Accessed November 25, 2013).; "Philo Taylor Farnsworth," Find A Grave, accessed <http://www.findagrave.com/cgi-bin/fg.cgi?page=gr&GSln=farnsworth&GSfn=philo&GSmn=taylor&GSbyrel=all&GSdyrel=all&GSob=n&GRid=3661&df=all&>.; For growing up without electricity, see *Distant Vision*, 27.

³ *Distant Vision*, 32-34.

⁴ *Ibid.*

⁵ *Ibid.*, 37.; George Everson, Farnsworth's financial backer, claimed Farnsworth conceptualized the idea in 1922 (George Everson, *The Story of Television: The Life of Philo T. Farnsworth* (New York: W.W. Norton & Co., 1949): 11, accessed <https://archive.org/details/storyoftelevisio00everrich>) (accessed January 29, 2013)). A newspaper article agrees with Everson and states that in 1922, at the age of 15, Farnsworth conceived of electronic television ("Philo T. Farnsworth to Be Banquet: Utahns to Honor," Newspaper and date not cited. In *Distant Vision*, 157).

⁶ *Distant Vision*, 34.; W. Rupert Maclaurin, "Patents and Technical Progress—A Study of Television," *Journal of Political Economy* 58, no.2 (April 1950): 145, accessed JSTOR.org (accessed December 5, 2013).

⁷ *Distant Vision*, 34.

⁸ *Ibid.*, 37.

⁹ *Sinish*, 5-6.

Farnsworth sketched his idea and gave it to Tolman, which would become extremely important in Farnsworth's lawsuit with RCA years later. The online Philo T. Farnsworth Archives, described as the "official family site for The Farnsworth Archives," with contributions by Kent Farnsworth, presents the sketch Farnsworth drew for Tolman of his image dissector tube idea ("The Sketch," The Philo T. Farnsworth Archives, accessed January 3, 2014, http://philotfarnsworth.com/actual_sketch.htm)).

¹⁰ *Ibid.*



¹¹ Sinish, 6.; *Distant Vision*, 5.

¹² Sinish, 6.; *Distant Vision*, 6-8.

¹³ Sinish, 8-9.; *Distant Vision*, 6, 46. See Chapter 5 of *Distant Vision* for an account of Farnsworth and his staff's early experiments constructing the cathode tube. Cliff Gardner, Elma's brother, was a glassblower and designed and built the tube, necessitating hours of precise glass manipulation (50). The lab work required various scientific objects and numerous people frequenting the building, concerning police in the Prohibition era, who mistakenly swept the lab after assuming the team was operating a still to produce alcohol (51).

¹⁴ *Distant Vision*, 86-91.; Sinish, 9.; Schatzkin, Chapters 4-7.; A description of the Image Dissector can be found in the pamphlet "Television: Bringing the World to Your Home," (Farnsworth Television & Radio Corporation, ca. late-1940's): 10, Rare Books and Manuscripts, Indiana State Library.

¹⁵ For the phrase "electronic television image," see Sinish, 9.; For a "quantum leap," see Schatzkin, 251.; Chapter 8 of *Distant Vision* provides an excellent description for the lay person of how the Image Dissector operates.

¹⁶ *Distant Vision*, 61.; For a technical explanation of Farnsworth's electronic transmission system in his own words, see P.T. Farnsworth and Harry R. Lubcke, "The Transmission of Television Images" *San Francisco Engineers* 8, no.3 (February 1930). In *Distant Vision*, 129.; "Scientists See New Television," Newspaper not cited, August 24, 1934. In *Distant Vision*, 162.

¹⁷ P.T. Farnsworth, *Electric Oscillator System*, Filed January 7, 1927, Patent no. 1,758,359, U.S. Patent and Trademark Office.; P.T. Farnsworth, *Television System*, Filed January 7, 1927, Patent no. 1,773,980, U.S. Patent and Trademark Office.

Distant Vision, Appendix. Most of these patents were assigned to Farnsworth's corporation, although he personally owned some. According to Elma, Philo was disappointed with television due to its programming, but reportedly told her that Neil Armstrong's moon landing made it "all worthwhile" (328).

¹⁸ For investors' irritation at the delay of a commercial product, see *Distant Vision*, 99.

¹⁹ For the first television demonstration, see Sinish, 11 and "Television: Bringing the World to Your Home," 11.

²⁰ See Chapters 14 and 16 of *Distant Vision* for the legal struggle against RCA.

²¹ *Distant Vision*, 131.

²² *Distant Vision*, 156-157.; Sinish, 6.; "Philo T. Farnsworth to Be Banquet: Utahns to Honor," Newspaper and date not cited. In *Distant Vision*, 157.; "The Sketch," The Philo T. Farnsworth Archives.



The results of the lawsuit greatly benefitted Farnsworth, as RCA had to pay to utilize his television patent, the first time RCA had to pay royalties rather than receive them (Sinish, 12.; "Companies Pool Patents," *Logansport-Pharos Tribune*, October 3, 1939, 2, accessed Newspaper Archive (accessed December 5, 2013)).

²³ Sinish, 13-14.

²⁴ *R.L. Polk & Co.'s Fort Wayne (Allen County, Ind.) Directory, 1938-1939* (R. L. Polk and Co. Publishers, 1938) City Directories of the United States, Fort Wayne, IN, 1938-1939, accessed Indiana State Library.; *R.L. Polk & Co.'s Fort Wayne (Allen County, Ind.) Directory, 1938-1939* (Detroit: R. L. Polk and Co. Publishers, 1939) 194, City Directories of the United States, Fort Wayne, IN, 1938-1939, accessed Indiana State Library microfilm.; Schatzkin, 175.; Sinish, 13-14. Farnsworth located his plant at 3700 East Pontiac in Fort Wayne, Indiana.

²⁵ Ibid.

²⁶ "Move FTRC Lab to Fort Wayne," *The Hammond Times*, July 28, 1939, 21, accessed Newspaper Archive (accessed November 25, 2013).; *Distant Vision*, 207.; Schatzkin, 179.

²⁷ *Distant Vision*, 198.

²⁸ "Television: Bringing the World to Your Home," 11, 17, 22.

²⁹ *Distant Vision*, 253.; Schatzkin, 186.

³⁰ Schatzkin, 199.; "Television: Bringing the World to Your Home," 16-17.; More research is needed for the other, less known Indiana plants.

³¹ "Television: Bringing the World to Your Home," 23.; Schatzkin, 188.

³² Schatzkin, 189.

³³ Quotation from Sinish, 15.; For pictures of production during World War II, see "Television: Bringing the World to Your Home," 11, 17.; "Farnsworth Television and Radio," *New York Times*, August 21, 1941, accessed ProQuest Historical Newspapers: The New York Times (accessed December 13, 2013).

³⁴ Sinish, 14.; "New Tube Makes Television 'Practical,' Californian Tells Radio Commission," *Christian Science Monitor*, December 5, 1930. In *Distant Vision*, 122.; Schatzkin, 160.

³⁵ Sinish, 14.

³⁶ City directories for Ft. Wayne from 1948 and 1967 were unavailable at the time of the review, although the marker is generally thought to be correct based on Fort Wayne city directories for 1949 and 1966 (*R.L. Polk & Co.'s Fort Wayne (Allen County, Ind.) Directory* (R. L. Polk and Co. Publishers, 1949) 829, City Directories of the United States, Fort Wayne, IN, accessed Indiana State Library).



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³⁷ Schatzkin, 188, 203.

³⁸ *Ft. Wayne News Sentinel*, October 6, 1945, 2, Indiana State Library, Business and Industry Clippings File.; "Merger Approved," *The Terre Haute Star*, May 5, 1949, 7, accessed Newspaper Archive (accessed November 25, 2013).; After selling his company to ITT, Farnsworth sold all of his Indiana plants, with the exception of the original Capehart plant in Fort Wayne and the WGL radio station (*Distant Vision*, 255).

³⁹ Schatzkin, 210.; *Distant Vision*, 255-258.; According to Sinish, two years after purchasing the FTTC in 1949, ITT "divided the operations into the Capehart-Farnsworth Company, the commercial group manufacturing TV and high fidelity audio systems, and Farnsworth Electronics who handled the government contracts" (17).

⁴⁰ Ernest E. Williams, "Farnsworth's A-power Unit Near Reality," *Fort Wayne Journal Gazette*, ca. January 1961. In *Distant Vision*, 292.; "I.T.T. Hopeful on Experiments to Harness the H-Bomb's Power," *NY Times Late Evening Edition*, January 3, 1961. In *Distant Vision*, 291.

⁴¹ For how scientists have yet to produce as much fusion as Farnsworth, see Schatzkin, 246.; For a description of the "fusion reaction tube" see *Distant Vision*, 268-291.

⁴² Sinish, 21.; Schatzkin, 244.

⁴³ *Distant Vision*, 319; Schatzkin, 244.

⁴⁴ *Distant Vision*, 317-318.

⁴⁵ *Distant Vision*, 331.

⁴⁶ "Philo Taylor Farnsworth," Find A Grave.; "U.S., Social Security Index, 1935-Current," *AncestryLibrary.com*.; According to Schatzkin, the family contends Philo died of a broken heart upon realizing that even the most renowned scientists did not understand his mathematical fusion concepts (244).