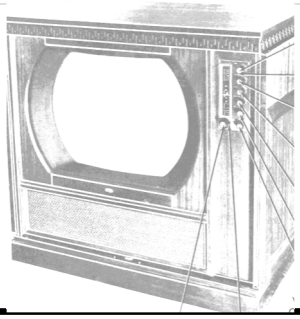
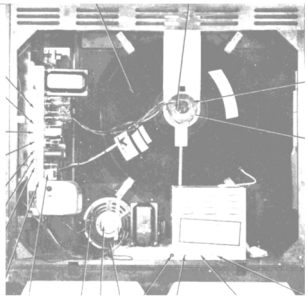
June, 2025

Volume 2 Number 6





WHAT'S NEW IN OLD TVS

The Newsletter of the Early Television Foundation

Greetings Early Television Fans,

This is Volume 2, Number 6 of the Early Television Foundation Newsletter. **The June Zoom meeting will be on Saturday, June 28 at 8 PM .** Steve McVoy began the May meeting with notes about the past Convention. 110 members attended and many filled out the survey. Steve said that all of the next convention will be at the held at the Museum . Changes will be made in the seating including changing the orientation of the room. Improvements to the setup for presentations and the PA system are planned. Changes to the silent auction are also being studied.

This years fall swap meet will take place on October 18. Also that afternoon the winning sweepstakes number will be drawn. There will be three prizes. The big DuMont Royal Sovereign, RCA CTC 5 and the FADA model 930

We Want to hear from you !

newsletter@earlytelevision.org

Editors: Mike Molnar and Robert Ring

In this issue:

Member Paul Kupersmith sent us a letter. He said that as copyrights have expired for some of the early Sam's Photofacts, there are now more early ones available, all free on-line.

Here is the link and thanks Paul.

https://archive.org/search?query=photofact

We are always looking for:

- **Letters** from members
- **Tech Tips** from service experiences
- **My first TV** (family stories?)
- **My favorite TV** (and why)
- **Stories** of working in the business.
- **Articles** that can be added in whole or in parts.
- **Biographies** of members

Any organization, like the ETF can only be as good as its volunteers.

This year the ETF was supported by some of the best.

So now a special thanks to some **Special Volunteers**

Bob Dobush - he has been really active at the museum. He handles the annual fire inspection, picks up and delivers for us at no charge, helps with arranging the warehouse, and many other things.

Blake Hinkle - arranged the Predicta display, makes frequent trips to the museum to help, is really helpful at the convention.

Matthew D'Asaro - arranged the vintage game display, helpful at the convention, helped re-organize our workshop and tools.

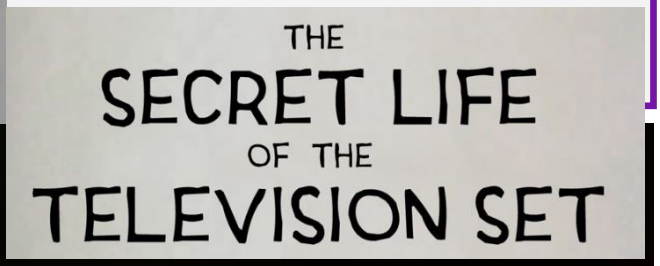
Dan Jones - arranged the mini color TV display, helped re-organize our workshop and tools.

Bob Andersen - did the workshop at the convention. Spent many hours restoring the Garod console set, and then donated it to the museum.

Dave Abramson - for his work as auctioneer and MC at the convention

and also many thanks to the presenters and many others volunteers and of course where would we all be without Steve and Larry.

During the Zoom meeting, Steve mentioned that an artist took away some unwanted old TVs from the Museum for his artistic work. It brought back a few memories of an old British TV series called “The Secret Life of Machines”. At the end of the episode about televisions, they created an artistic display of old TVs and then set a match to it. This and other episodes can be found on YouTube.



GOING…...GOING…...GONE

Early History of Computer and Video Games

As early as 1950, computer scientists couldn't resist the urge to see if a main-frame computer of the day could play games. One such game was called "Bertie the Brain", and it was used to play tic tac toe. Another was called "Nim". Nim is played starting with piles or rows of objects. Players take turns taking any number of objects from one of three piles. While not very action-packed or exciting it did pave the way for "Tennis for Two", created by William Higinbotham in 1958 which used an analog computer and an oscilloscope. Come to think of it, Tennis for two on an oscilloscope does not sound that action-packed either.

But in 1961, "Spacewar!" was developed for a mainframe computer at MIT. It allowed two players to simulate a space combat fight on the mainframe's point plotting display. As MIT graduates, and some who did not graduate but did move on, spread the game to other mainframes, the system gained in popularity. But it remained esoteric to the rest of the world until computer languages of BASIC and C were more widely adopted and were more accessible than FORTRAN and COBOL.

Early Computer Games

SPACEWAR!

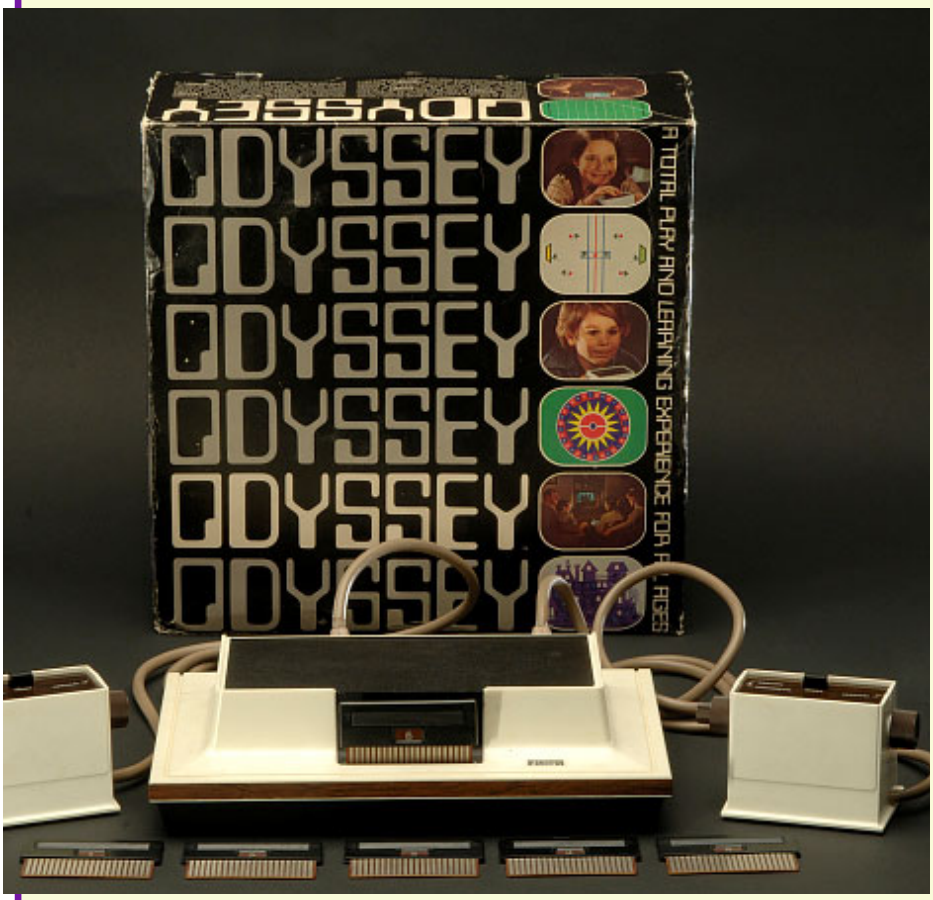
While most games were created on hardware of limited graphic ability, one computer able to host more impressive games was the PLATO system which was developed at the University of Illinois. Intended as an educational computer, the system connected hundreds (not millions) of users all over the United States via remote terminals that featured high-quality plasma displays.

PLATO TERMINAL

But none of these systems were available for home use. Some did see increased popularity in arcade game format as these types of games were slowly but surely pushing out the electro-mechanical pinball games, but even those were not workable for a regular home environment. Almost every home already had a television so the key would be to design a game and a system that could play through the already purchased set.

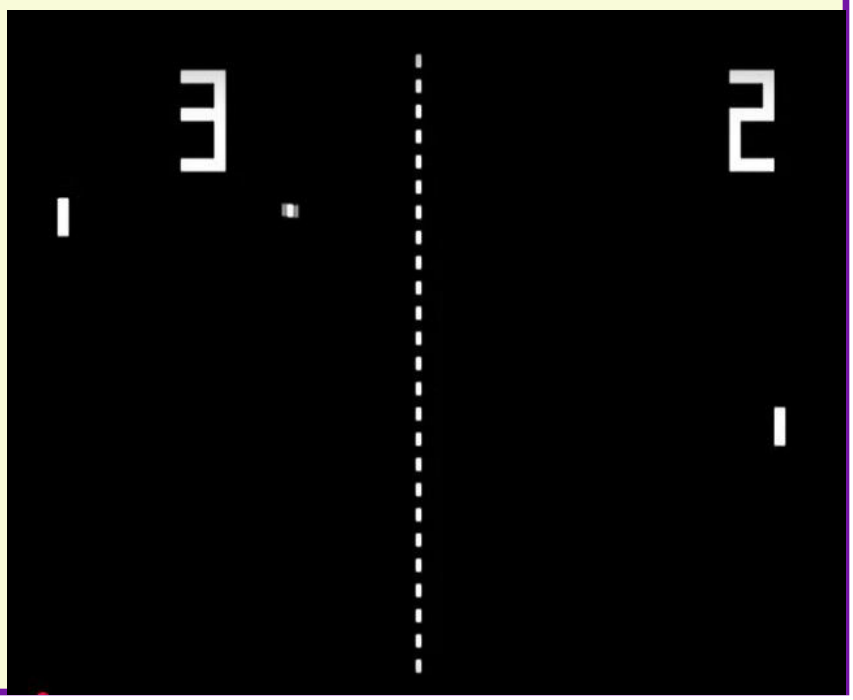
The real breakthrough in home video game play came with the introduction of The Magnavox Odessey in the early 1970's.

Then things really started falling into place. Nolan Bushnell, inspired by the table tennis game on the Odyssey, hired Allan Alcorn to develop an arcade version of the game, this time using discrete transistor–transistor logic (TTL) electronic circuitry. "Pong" was released in 1972.



Capitalism took over and we soon were awash in clone "Pong" games for home use while the original creators fought it out with lawyers and the courts as to who owned what.

.



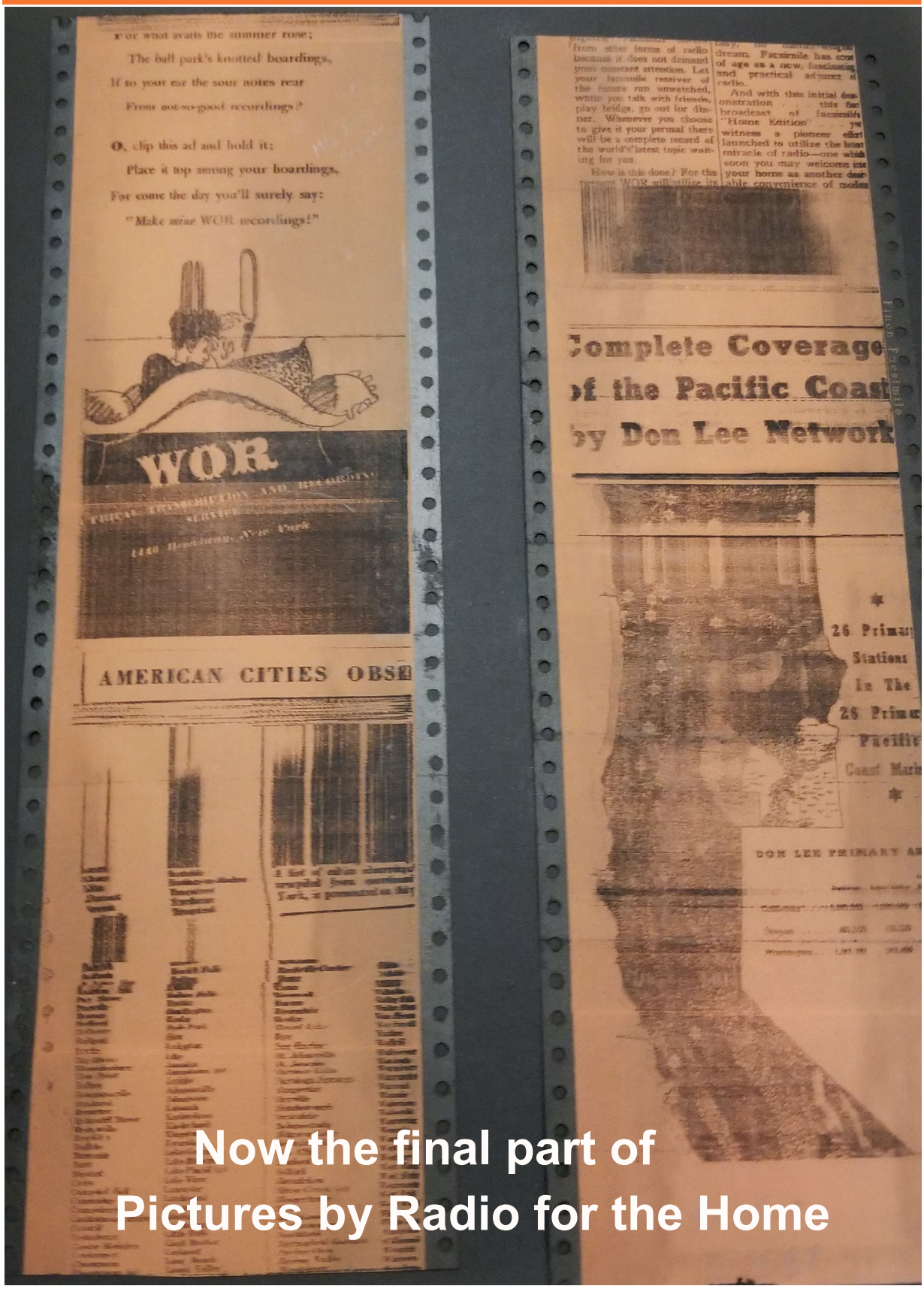
HOME VIDEO GAMES TAKE OFF

Meanwhile, arcade video games caught on fast in Japan due to the many partnerships American electronic companies had with them and after releasing Pong clones in 1973, through a partnership with Atari, Taito and Sega released newer games like Gun Fight" in 1975.

The Magnavox Odyssey never caught on with the public, due largely to the limited functionality of its primitive discrete electronic component technology but by mid-1975, large-scale integration (LSI) microchips had become inexpensive enough to be incorporated into a consumer product. In 1975, Magnavox reduced the part count of the Odyssey using a three-chip set created by Texas Instruments and released two new systems that only played ball-and-paddle games, the Magnavox Odyssey 100 and Magnavox Odyssey 200. Atari, meanwhile, entered the consumer market that same year with the single-chip Home Pong system. The following year, General Instrument released a "Pong-on-a-chip" LSI and made it available at a low price to any interested company. Toy company Coleco Industries used this chip to create the million-selling Telstar console model series (1976–77).

Next was the Intellivision System from Matel and the race for one-upmanship was on.

When Radio Pictures were sent by AM Radio to The Crosley “Reado” things could often go wrong, like when a passing thunderstorm could send the printer into hyper drive thus stretching things out.



Now the final part of Pictures by Radio for the Home

Rayfoto Fades Away

After the period from late 1927 through 1928, very little appeared in the press about the Cooley Rayfoto System, most likely because, for the average radio fan, the operation of the system was not simple. A set up time was required for each program, which included hooking up batteries and developing the photographic paper that was used—and then there was a breakdown time. Obviously this was not an option for the "mom and pop" radio listener. Also, radio listeners without a picture receiver would have to listen to a few minutes of squeaks and squeals during the picture transmission period.

Since it never caught on in great numbers, it can be assumed that the Rayfoto system found it difficult to attract advertisers. It is also safe to assume many listeners would find another station during this time. That would certainly drive away even more advertisers. Therefore, if the small number of listeners using picture receivers drove away the advertisers, the lack of advertisers would cause broadcasters to stop the programming. If there is no programming of picture transmissions, there is not much one can do with a Cooley Rayfoto System.

The Next Fad: Radio Broadcast Facsimile

The Finch System

Inventor William Finch had experimented with facsimile beginning in the early 1920s. While working for the International News Service, one of the Hearst companies, he was awarded well over a hundred patents.[16] Forming his own company in 1935, Finch Telecommunications Inc., he promoted a different approach to sending images by radio. His idea was to send an extended picture message. The receiver would send information to a printer that would print from a long roll of paper (see Fig. 31), and this chemically-treated paper did not require any processing after printing. A diagram of the Finch System shown in Fig. 32 reveals some familiar concepts used in early fax machines from 1980–1990.

The Finch receiver would be activated by a timer after regular broadcast hours, and the subscriber would wake up to a newsletter or other information ready to cut off the roll (see Fig. 33). Finch made arrangements with several radio stations to provide broadcasting for his system, and his company prepared to sell subscriptions to customers in those areas.

In the 1920s, as radio broadcasting was rapidly expanding, newspapers provided nearly all the news service to the public. As radio vied for a part of the news service business, they ran into strong resistance from newspaper

Fig. 31. Finch Printer (Detroit News Archives)

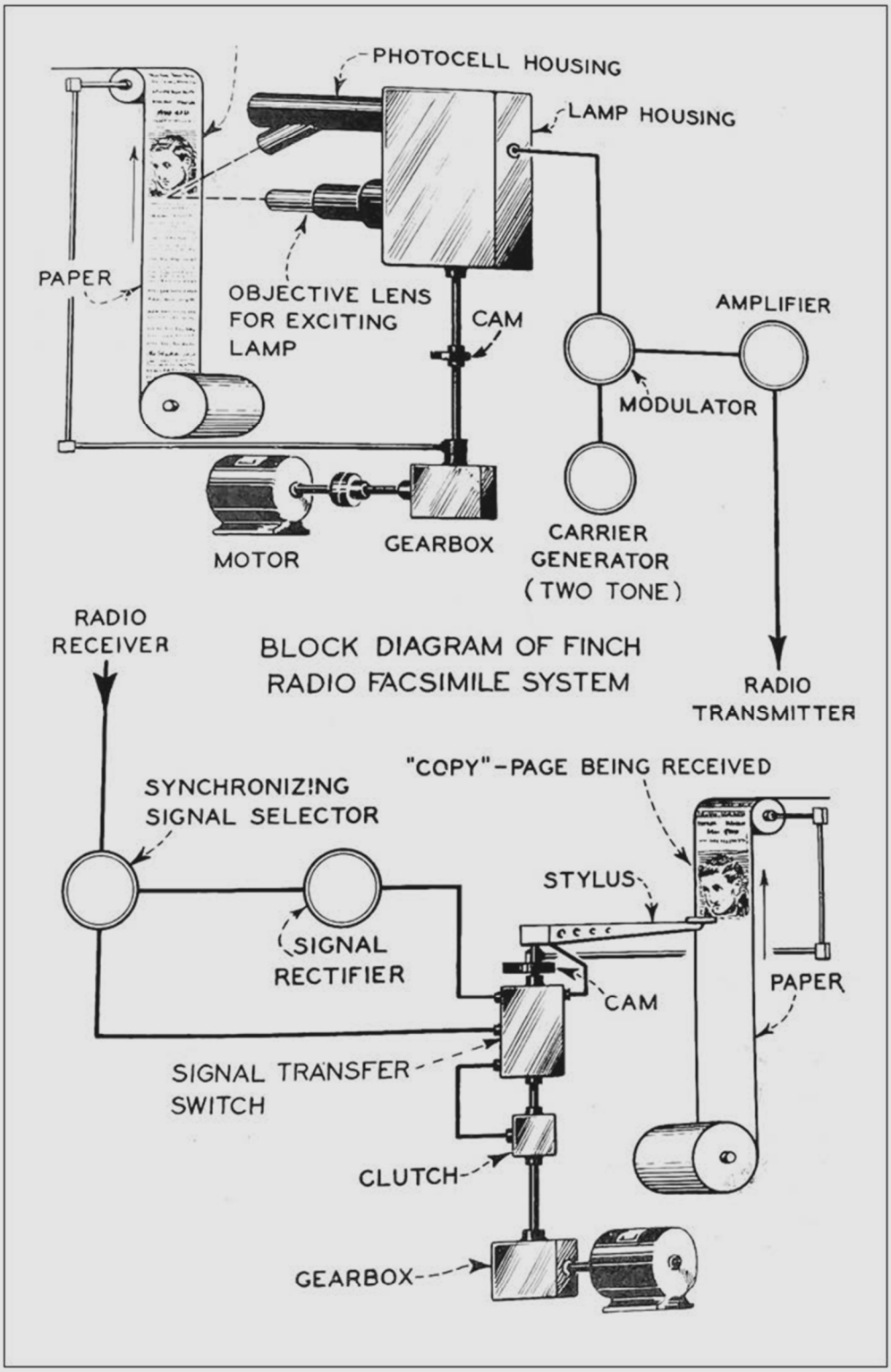


Fig. 32. Finch printer assembly. (Jack Poppele Scrapbook Collection, AWA Museum)

Fig. 33. System described as "So Easy a Child can Operate the Finch System." (Detroit News Archives)

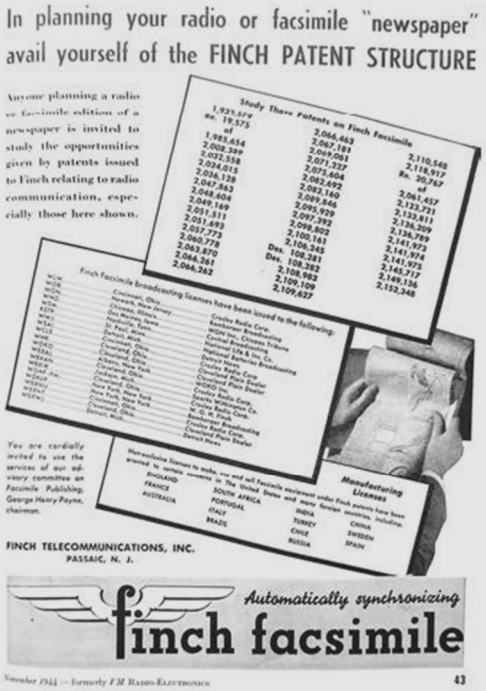


Fig. 34. Finch Telecommunications Inc. advertisement. (*FM and Television*, Volume 4, No. 11, 1944, p. 33)

publishers, who had little interest in sharing advertising dollars with the new radio stations. Radio broadcasters had to go as far as forming a news service of their own, Transradio News Service. It is easy to see why the newspapers would resist sharing content with new facsimile services—radio services could get information to the subscriber's home faster than a newspaper could be delivered. The difficulty obtaining good news content for the facsimile service would, in turn, make it difficult to keep subscribers. Fewer subscribers meant less advertising revenue to help support a facsimile system.[17] Although other facsimile companies came and went, Finch held on for many years. It appears that a large part of his income was derived from patent licensing, as shown in his trade advertisements, one of which appears in Fig. 34. One of these licenses would go to one Powell Crosley, Jr. Crosley's "Reado" system is described next.

Introducing the "Reado"

Powell Crosley Jr., the widely proclaimed "Henry Ford of Radio," became a believer in radio broadcast facsimile to the home during the period from 1938 to 1940. Always mindful of his market in rural America with other products such as the "Icyball,"[18] he believed that listeners who were unable get a daily newspaper would like a newsletter appearing at the back of their radio every morning. After procuring a license on the Finch system, he began broadcasting from his

experimental radio station W8X0 and soon his station WLW, which had coverage over a large part of the country. He also convinced WOR chief engineer Jack Poppele to begin test broadcasts. Facsimile prints were sent from the New York City area to Crosley in Cincinnati and from Crosley back to Poppele. Soon WGN joined as a facsimile broadcaster and eventually thirteen broadcast stations were equipped to transmit facsimile. These broadcasters were part of the Mutual Radio Network. If Crosley could maintain regular programming by a network of facsimile broadcasters, his plan could be a success. The experimental broadcasts found that the printer was sensitive to static. A burst of static could send a few feet of paper advancing through the system. Experiments showed that shortwave transmissions were more stable. Other stations joined the testing, and plans were made for regular transmissions on AM radio. The FCC gave permission for facsimile transmission after regular broadcast hours on the AM band and at all hours on shortwave band from 25 to 47 MHZ.[19]

Crosley introduced his receiver model 758-A, which was a dual-band AM and shortwave radio with an output for the printer (see Fig. 35). The printer model 118 shown in Fig. 36, named the Reado, was listed to sell for $79 or $59 as a kit. The owner could place a timer inside the Reado to start the reception in the early morning hours (see Fig. 37). Crosley set up an assembly line at his Arlington Street assembly plant, which was capable of producing a hundred units per day.[20] Reado printers were shipped to Crosley

Fig. 35. Crosley Reado promotional material. (Composite of ads, *AWA Review*, Vol. 16, 2003, pp. 85-86 and the author's collection)

Fig. 36. Crosley Reado Model 118. (Author's collection)

dealers, who were ready for the buyers to line up at the door. As units were shipped to Crosley dealers in areas able to receive transmissions, it was discovered that the Reado image quality left

much to be desired when compared to newspapers. In addition to the narrow print, line drawings were used because photographs did not reproduce well (see Fig. 38). As time passed, Crosley waited and waited for the buyers to line up at his dealerships. After all of Crosley's effort to provide program content, schedule transmissions, form a broadcast network, manufacture the receiver hardware, and market the Reado printer at a reasonable price, Crosley was unable to generate customer interest.

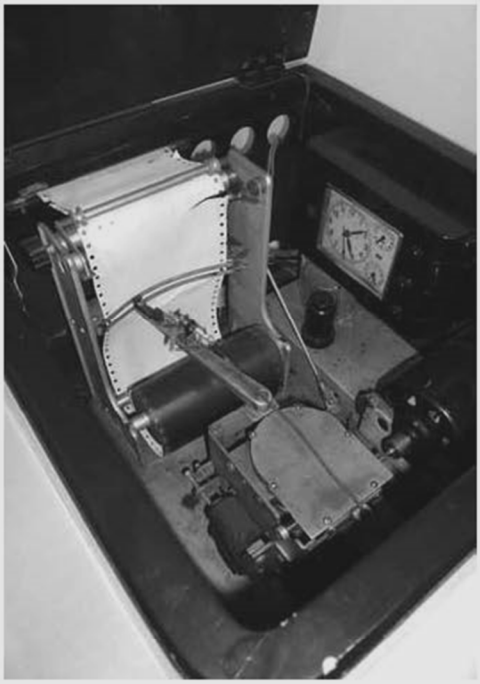


Fig. 37. Reado with user-supplied timer added. (Author's collection)

Fig. 38. Reado printout sample. (Author's collection)

Commercial Pictures by Radio

Some of the earliest work to send pictures by radio is described in a text by Marcus J. Martin, in 1921.[21] Martin describes a crude system with a rotary spark transmitter and a receiver using a coherer. No sample images appear to exist for this system. The early work by RCA, including the transatlantic picture transmission of 1924, demonstrated that a point-to-point radio facsimile service was possible. Two years after that demonstration, a commercial service was started in 1926 from New York to London, and research continued. Service was then expanded, as arrangements were made to work with other companies using compatible equipment. RCA teamed with Marconi, Siemens, Cables & Wireless, Telefunken, and Reich Post to initiate the point-to-point service shown in Table 2.[22]

An RCA publication titled "Radio Facsimile" collected articles by the research staff and presented a detailed picture of radio facsimile development. The result of this work was demonstrated in a side-by-side comparison of a transmission using the 1924 equipment, next to the same image using the 1938 equipment (see Fig. 39). It was the RCA

Table 2. RCA international point-to-point Radiophotogram services.

City	City	Date Initiated
New York	London	May 1, 1926
New York	San Francisco	May 15, 1929
Berlin	Buenos Aires	June 9, 1930
New York	Buenos Aires	Aug. 8, 1932
New York	Berlin	April 18 1932
London	Australia	Oct. 16, 1934
London	Buenos Aires	Jan. 1, 1937

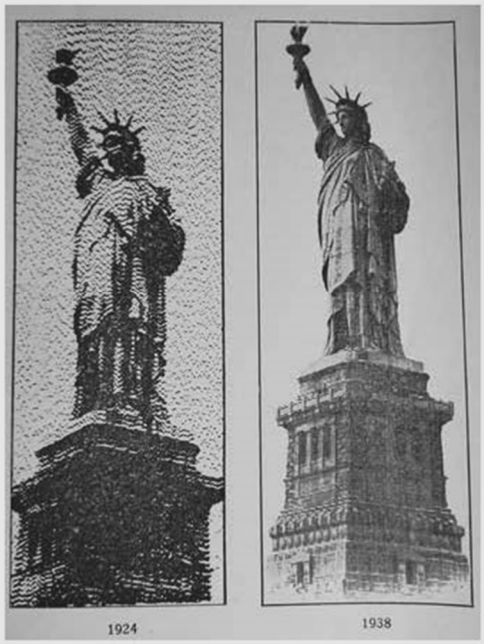


Fig. 39. Comparison of RCA transmissions 1924 (left) and 1938 (right). (*Radio Facsimile*, Vol. 1, 1938, p. vii)

Communications Division of RCA that carried out this work. Many top RCA researchers were involved, including Vladimir Zworykin. All aspects were investigated: the printer types, papers, electronics, photocells and scanners. An article written by noted radio engineer and RCA consultant Alfred Goldsmith stated that the value of this research was as a stepping-stone toward television. He noted the restrictions caused by the technology available at that time, and he pointed out that because facsimile would need only 1% of the bandwidth required for a good television picture, a radio facsimile service was a more achievable goal.[23]

Much of the research to achieve the improvement demonstrated in the comparison of images from 1924 with those from 1938 was presented at meetings of the Institute of Radio Engineers (IRE) by the engineers leading the different areas of research. There were five such presentations documented in the Proceedings of the Institute of Radio Engineers.[24] They also tested different modes of modulation, settling on phase modulation. They transmitted a regular series of pulses and varied the pulse width in accordance with the intensity of the scanned signal. A pulse width could be varied from 10% to 90% of space between pulses to print a range from white to black.

As early as 1926, RCA demonstrated the ability to add an image to their radiograms. This example of a Radiophotogram showing a policeman on a truck is in the collection of the Museum of Modern Art in New York (see Fig. 40). In 1938, with their technical advances proven, RCA was confident that broadcast facsimile had improved to a degree that home facsimile service would achieve market acceptance. A facsimile scanner was designed and produced for broadcasting stations (Fig. 41), and a home receiver was also introduced (Fig. 42). A number of broadcast stations purchased the Facsimile Scanners, and the Facsimile Receiver was intended for the home market. Unfortunately, as the depression years dragged on, the RCA effort, like that of others, suffered the same lack of public interest. During the 1930s RCA continued to improve and expand commercial radio picture and radiogram service. RCA planned and constructed an ultra-high frequency network between New York and Philadelphia, which is shown schematically in Fig. 43.

John V. L. Hogan was a noted radio engineer and entrepreneur. In 1937 he founded New York Radio Station WQXR. In 1939, FM transmission was added to the WQXR radio service. Hogan, through his company, Radio Inventions Inc., began experimenting with a facsimile system over FM. As technology had advanced, FM transmission held the promise of faster transmissions of higher quality. Soon all work toward facsimile broadcast went on hold as consumer electronics production was halted by World War II, and Hogan and others

Fig. 40. RCA Photoradiogram circa 1926. (www.moma.org/collection/works/58675)

Fig. 41. RCA scanner. (St. Louis Post Dispatch)

Fig. 42. RCA home fax receiver, 1938. (Wide World Photo)

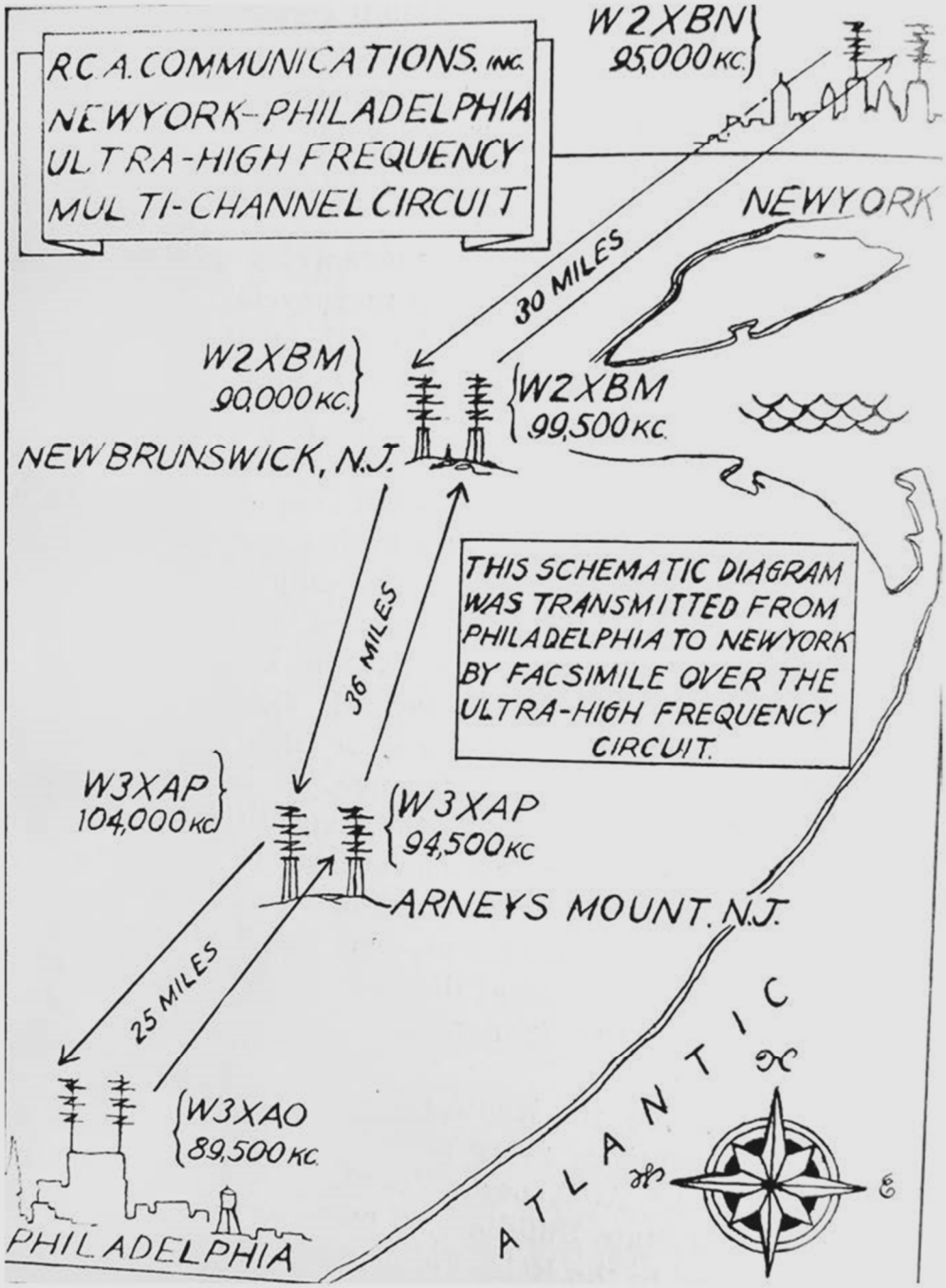


Fig. 43. RCA Communication's facsimile network, New York to Philadelphia. (*Radio Facsimile*, Vol. 1, 1938, p. 214)

went on to perform research for the military effort.

After the war, FCC approval was granted, and a frequency allotment was made on the new postwar FM band. The high end of the FM band, 106 MHz to 108 MHz, was designated for facsimile and facsimile services that had started up. Research by Hogan and others continued into the latter half of the 20th century. Fax service could be transmitted on a FM subcarrier at a faster speed and with a higher image quality with no interruption to a listener. In the 1970s, RCA researched providing a fax service piggybacked onto the standard TV signal. A proposal was made to send facsimile data during the vertical interval reference (VIR) part of the NTSC standard TV signal,[25] just as closed captioning was later provided. A printer attached to a TV for facsimile service never came to pass.

Mr. Cooley After Rayfoto

As the concept of radio pictures for the home was fading from the scene, there was a brief effort by the Rayfoto Company to enter the mechanical TV field. They introduced what was promoted to be an improved neon tube for television imaging and some scanning discs. One unusual disc had a series of pins around the perimeter that were intended to receive an arc from the corona generator and project an image of the arc onto a small screen. How this would work was unclear, and none of their equipment appears to survive today.

Austin Cooley then began working for the Times News Service, World Wide Photos, where he worked on systems for a Wirephoto Service and Radiophoto Service for newspapers. In 1935 he made news himself when he responded to the news of the crash of the Macon, a navy dirigible. Cooley was able to take pictures of the survivors being brought ashore, which he then sent across the country by radio. This was the first such transmission.

Throughout a long career, Cooley worked on systems to transmit weather maps, medical x-rays, photographs, and other facsimile materials. During World War II, he worked with the military to develop systems to send maps and weather maps to the commanders in the field. He was later honored by the War Department for this work (Fig. 44). During the 1950s, he was vice-president of the Times Facsimile Service, where he developed systems for sending weather maps by radio to ships at sea. In 1959 Litton Systems purchased the facsimile business from The New York Times Company. Cooley moved to Litton and as years went by he worked on systems to transmit images using early communication satellites.

Fig. 44. Military use of facsimile receiver. (*The Rise and Fall of the Fax Machine*, 2015, p. 78)

Austin Cooley was awarded 75 patents over his long career and among other awards received the Marconi Medal from the Veteran Wireless Operators Association. He also received the DeForest Club medal. He passed away in 1993 at the age of 93.[26]

Conclusion

As we have seen, there are many good arguments for claiming that the Cooley system was a valid link in the chain as radio progressed to television. The Cooley system was made available in both kit and assembled form, and radio stations in many cities transmitted programs with pictures to homes on a regular schedule. It is part of a continuous line of development preceded by early pictures by wire, then commercial pictures by radio. After the Cooley system, others continued the line of development to offer radio facsimile for the home as well as commercial photo services. Austin Cooley himself had a long and distinguished career in facsimile transmission.

None of the home facsimile services ever seemed to catch the public's attention enough to become economically viable. Home and office point-to-point fax machines connecting over phone lines hit their peak some years ago. Now, with the exception perhaps of lunch menus, much of this service is shifting to the Internet. Today one can make the argument that the Internet is providing too much of this service, but just as with the earliest work in 1842, images are still taken apart one pixel at a time, transmitted, then put back together again.

For myself, I have to think back on opening that box for the first time. I never would have guessed that I would get so much from the few parts in a box labeled "Cooley Rayfoto System of Radio Pictures for the Home."

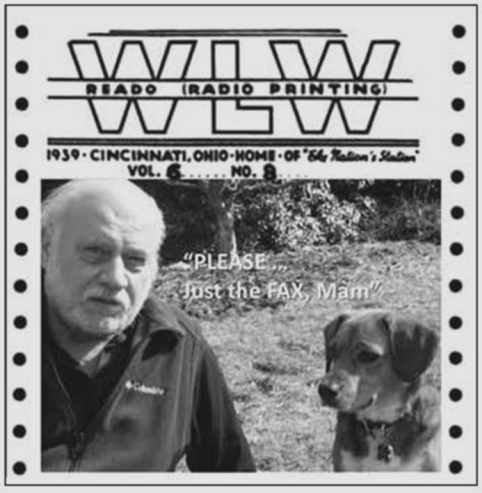
Endnotes

1. "Pictures by Radio," *Radio Broadcast*, Vol. XI, No. 5, Sept. 1927, p. 279.
2. Keith Henney, "Now—You Can Receive Radio Pictures!," *Radio Broadcast*, Vol. XI, No. 6, Oct. 1927, p. 341-3.
3. Austin G. Cooley, "How the Cooley 'Rayfoto' System Works," *Radio Broadcast*, Vol. XII, No. 1, Nov. 1927, p. 23–5; Austin G. Cooley, "Make Your Own Radio Picture Receiver," *Radio Broadcast*, Vol. XII, No. 2, Dec. 1927, pp. 114–7.
4. Edgar H. Felix, "Why I Installed a Cooley Picture Receiver," *Radio Broadcast*, Vol. XII, No. 3, Jan. 1928, pp. 215–6.
5. Alfred N. Goldsmith, et. al, ed., "Radio Facsimile: An Assemblage of Papers from the Engineers of the RCA Laboratories…," (RCA Institutes Technical Press, 1938, Vol. 1) p. 2; see https://catalog.hathitrust.org/Record/005756573.
6. C. Francis Jenkins, *Vision by Radio, Radio Pictures, Radio Photograms*, (Jenkins Laboratories, Washington, D.C., 1925) p. 73.
7. Ibid., p. 83.
8. T. Thorne Baker, *Wireless Pictures and Television*, (D. Van Nostrand Co., New York, 1927) p. 71.
9. Jenkins, C. Francis, p. 95.
10. Ibid.
11. Ibid., p. 85.
12. Alfred N. Goldsmith, *Radio Facsimile*, p. 3.
13. Edgar H Felix, p. 215.
14. Rayfoto Co. Sales brochure; see http://www.earlytelevision.org/pdf/rayphoto.pdf
15. Edgar H Felix, p. 215.
16. Charles J. Stinger, "The Eminent Years of Powel Crosley Jr., His Transmitters, Receivers, Products and Broadcast Station WLW, 1921–1940," *AWA Review* Vol. 16, 2003, pp. 85–86.
17. *FM and Television*, Vol. 4, No. 11, 1944, p. 42.
18. Crosley bought the rights to the Icyball refrigeration idea, and brought it to market. Powel Crosley had a gift for recognizing great ideas and a gift for marketing. See "Crosley Icyball" at

http://crosleyautoclub.com/IcyBall/crosley_icyball.html.
19. Charles J. Stinger, pp. 85–86.
20. David Stern, Michael A. Banks, Rusty McClure, *Crosley: Two Brothers and a Business Empire that Transformed the Nation*, (Clerist Press, Cincinnati, OH, 2006) p. 324.
21. Marcus J. Martin, *The Electrical Transmission of Photographs*, (Sir Isaac Pitman and Sons LTD, London, 1921), pp. 40, 70.
22. Alfred N. Goldsmith, *Radio Facsimile*, p. 113.
23. Ibid., p. 67.
24. Richard H. Ranger, Transmission and Reception of Photoradiograms," *Proc. IRE*, Vol. 2, Apr. 1926, p. 161; Alfred N. Goldsmith, "Image Transmission by Radio Waves," *Proc. IRE*, Vol. 17, Sept. 1929, p. 1536; J. W. Horton, "The Electrical Transmission of Pictures and Images," *Proc. IRE*, Vol. 17, Sept. 1929, p. 1540; Richard H. Ranger, "Mechanical Developments in Facsimile Equipment," *Proc. IRE*, Vol. 17, Sept. 1929, p. 1564; J. L. Callahan, J. N. Whitaker, Henry Shore, "Photoradio Apparatus and Operating Technique Improvements," *Proc. IRE*, Vol. 23, Dec. 1935, p. 1441.
25. National Television System Committee
26. Richard D. Lyons, "Obituary," *New York Times*, Sept. 9, 1993.

About the Author

Mike Molnar founded Diagnostic Services Inc. in 1983, and it still keeps him busy building nuclear medicine gamma cameras for veterinary clinics around the world. Mike also finds time for the care and feeding of a 40-year collection of electronic fossils. Once again, Pam, Mike's understanding wife, had to hear Mike say, "I don't think this article will take too long." This year, with the help of his faithful assistant Lila, many electronic fossils will be shared with the public in a display at the local library and in a long-term exhibit at The Red Mill Museum, Clinton, NJ.



Author **Mike Molnar** (left) and Lila.