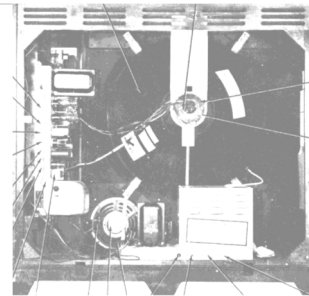
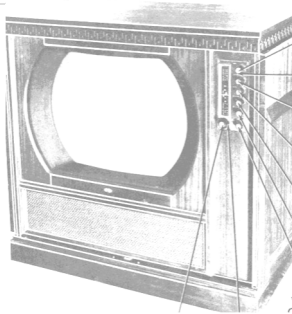


February, 2025

Vol 2 Number 2



# WHAT'S NEW IN OLD TVS

## The Newsletter of the Early Television Foundation

Greetings Early Television Fans,

This is Volume 2, Number 2 of the Early Television Foundation Newsletter. **The February Zoom meeting will be on Saturday, February 22nd at 8 PM**  
**The Early Television Foundation 2025 Convention is set for May 2,3,4** at the museum in Hilliard, Ohio. If you missed last month's meeting it will be worth your time to see it on YouTube. James O'Neal's presentation on the Orthiconoscope and Steve McVoy's presentation of the ATC Kinet were both unusual and very interesting. The best thing about February, for us on the East Coast, is that March is closer. We've had freezing cold, wind, snow, sleet, ice, rain and that was all on Monday. Also your editors met for a friendly lunch to discuss the newsletter and life in general and two days later, we both tested positive for a nasty strain of covid. I know that I can't wait for the March newsletter.

**We Want to hear from you !**

[newsletter@earlytelevision.org](mailto:newsletter@earlytelevision.org)

**Editors: Mike Molnar and  
Robert Ring**

### **Board of Directors Early Television Foundation**

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(President, Treasurer)

### **In this issue:**

**We feature another museum you may find interesting.**

**The Antique Wireless Association Museum in Bloomfield, NY**

**And the final installment When Television was "Just Around the Corner"**

**Don't Forget !!!  
Renew your 2025  
Membership**

### **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

## SOME CONVENTION CHANGES FOR 2025

The admission charge will be lowered to \$25 for members, and \$35 for non-members from \$40

All events will be at the museum - we will have comfortable chairs

Food trucks will be at the museum for the Friday evening event and for Saturday lunch-there will be no catering for lunch and dinner

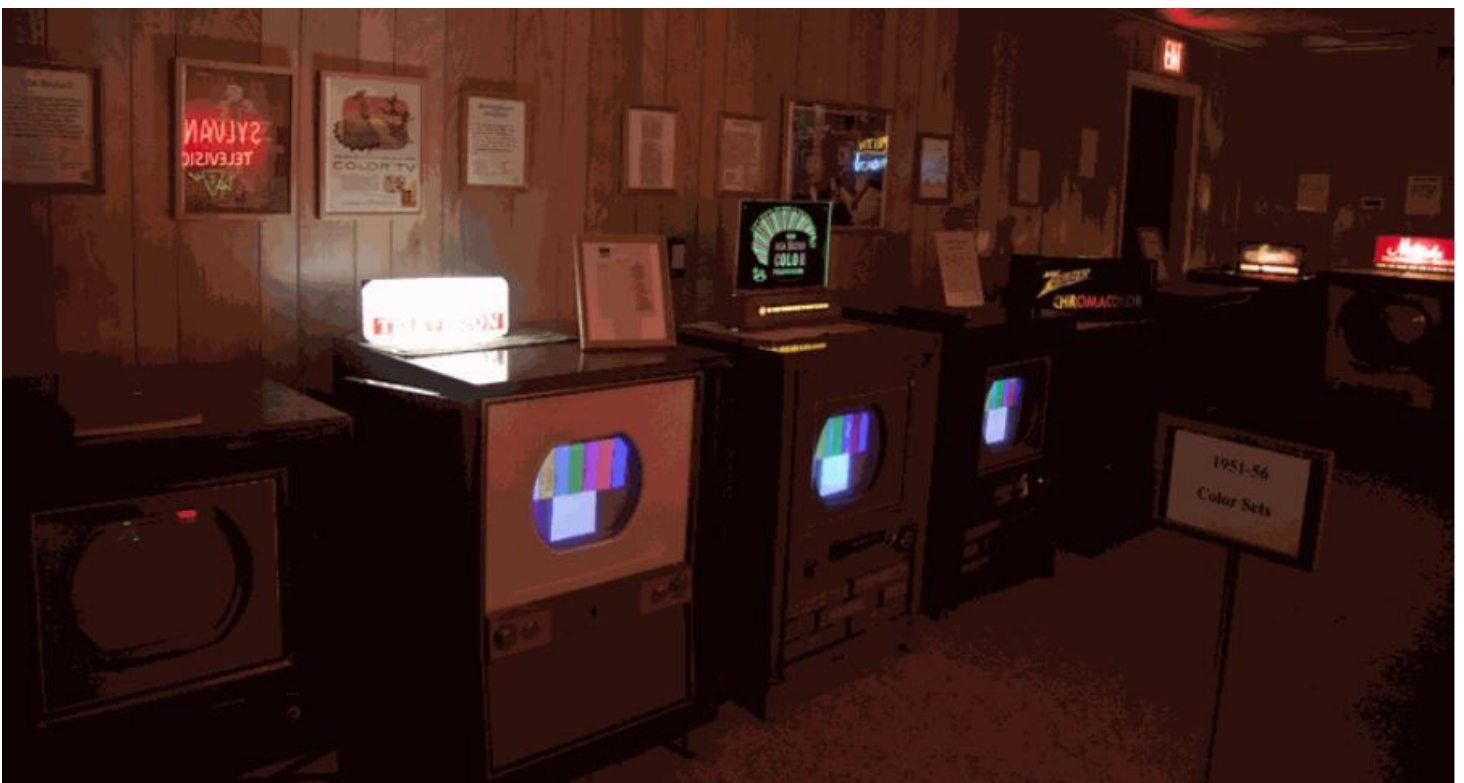
No additional charge for vendors

Saturday dinner will be held at a local restaurant (individual payment)

We are looking for conference presenters. Specifically looking to aim the presentations for people not fully in the hobby. We need presentations about the **basics of collecting** and **restoring old sets**, and the **use of CRTs in gaming**.

On Friday afternoon, Bill Anderson will be completing a restoration project LIVE for an interactive presentation.

Here are a few pictures from the 2011 convention.  
It was nice to see all of the 15 inch sets shining bright





The Auction is always popular, plenty to browse or buy and always plenty to discuss. TVs from a few dollars to a few thousands and plenty of advisors ready to comment.



The best reason to come to the convention is to find old friends, make new friends and to have fun.  
You can be part of the picture for 2025

And now the ETF Newsletter will present a look at another Museum our members may find of interest. All aspects of Communication Technologies are covered, from the earliest spark equipment, ham radio, broadcast radio, television and more. The people who made all of this possible, Marconi, Armstrong and others are all remembered, and there are artifacts you won't see anywhere else.

## **AWA Communication Technologies Museum**



## **The AWA Communication Technologies Museum**

The AWA Communication Technology Museum is open Tuesdays 10 AM to 3 PM and Saturdays 1 PM to 5 PM except when New Year's Eve and Day, Easter, Fourth of July and Christmas Eve and Day fall on a Tuesday or Saturday. The last guided tour begins one hour before closing.

AWA Communication Technology Museum  
6925 Route 5, Bloomfield, NY 14469

# The AWA Communication Technologies Museum



Under the guidance of Curator Lynn Bisha (left) and AWA President Bob Hobday, a dedicated staff arrives every Tuesday and Saturday to greet visitors, run classes and work to maintain this world class collection. The Antique Wireless Association, founded in 1952, has been the trusted site for donations of thousands of historical artifacts. If you need another reason to visit, the museum is located in the beautiful Finger Lakes region of New York State.

More about the AWA and the Museum next month





TOP This is a display of original Marconi components set up as on the HMS Titanic

BOTTOM This popular display shows the items a 1920s radio store would stock



The Museum has displays of very small things such as rare early vacuum tubes and crystal detectors and they also display very, very large things such as the actual control room of the Voice of America. More next month



May — June

# TELEVISION News

HUGO GERNSBACK Editor

## FEATURES:

PRACTICAL HINTS ON BUILDING  
TELEVISION RECEIVERS

RECENT RESULTS IN TELEVISION  
WITH BRAUN TUBES

TRIPLE SCANNING

NEW GLOW DISCHARGE LAMPS  
FOR TELEVISION

FULL SIZE SCANNING DISC  
TEMPLATES

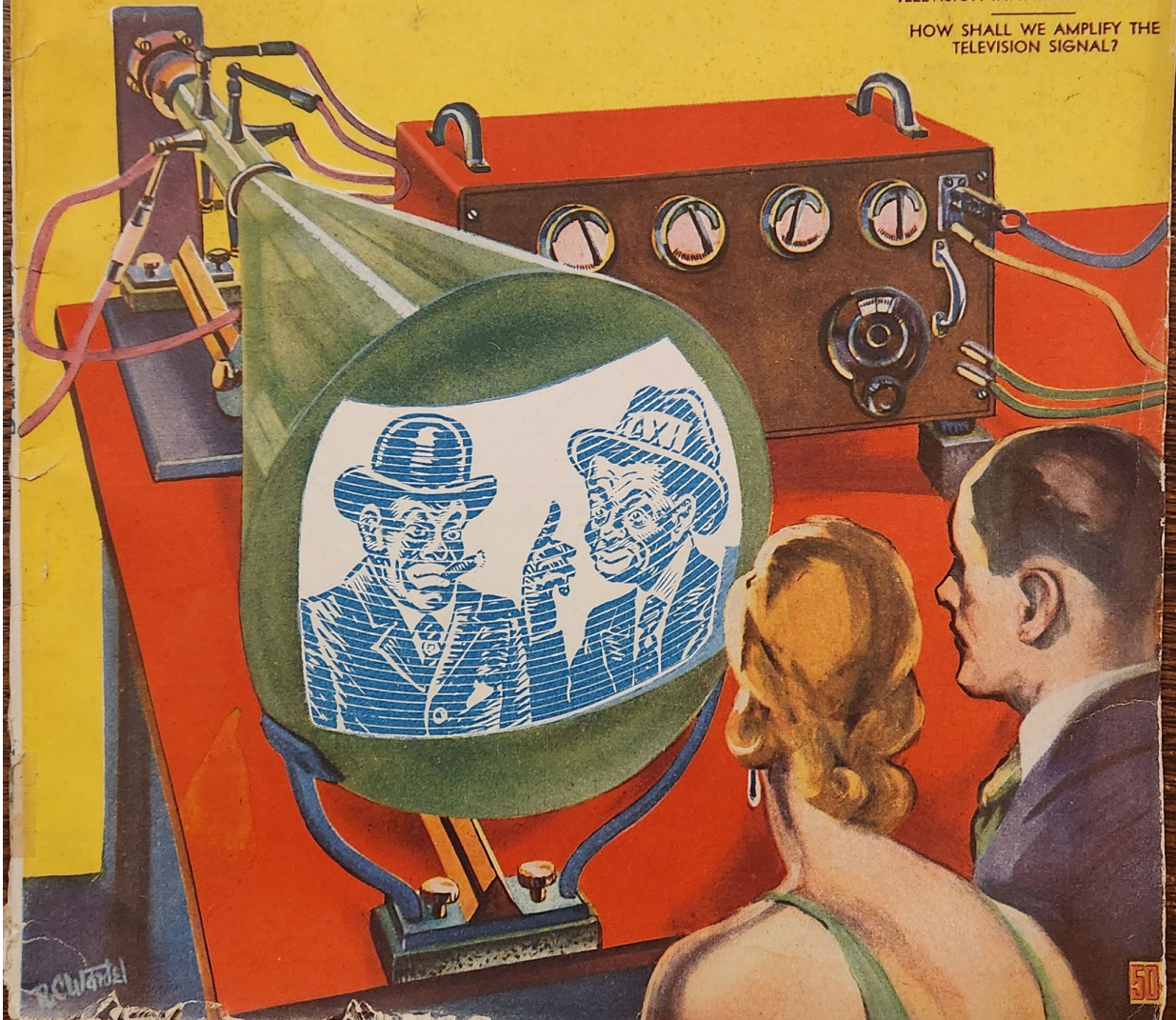
HOW THE GERMANS TELEVISION

CONE PULLEY SPEED ADJUSTER

A NON-MECHANICAL SCANNER

TELEVISION IN THREE DIMENSIONS

HOW SHALL WE AMPLIFY THE  
TELEVISION SIGNAL?



What killed mechanical TV ??? You can't see Amos and Andy.  
The radio show was so popular that movie theaters delayed  
start times so that fans won't miss an episode.

## TIME TO RENEW YOUR MEMBERSHIP FOR 2025 EARLY TELEVISION FOUNDATION



You won't know what's coming down the line if  
you aren't a member and ..... we'll miss you

And now you will find out if television sets will all need motors  
when you read the exciting conclusion of

**When television was “Just Around the Corner”**

## When Television was Just Around the Corner

### *Other Manufacturers*

Along with the large companies and companies formed by inventors, there were several others producing mechanical televisions to add to their radio products or startup companies hoping to ride the TV boom. Some also produced kits of components for the home experimenter.

The Daven Company of Newark, NJ, produced signal amplifiers to drive the neon glow lamps, discs, and other components. They also had a unique product in their line, both as a part or a

complete receiver. It solved the problem for the experimenter hoping to receive images from several broadcasters at a time when there were no official standards. They used a large disc that enabled viewing of three different formats.<sup>36</sup> The disc had an outer spiral, inner spiral, and middle spiral. With a good radio receiver attached to the Daven amplifier, the experimenter can search the airwaves for more viewing opportunities and move the neon lamp and socket up a rail for the matching format of 48 holes, 36 holes, or 24 holes (Fig. 44).



Fig. 44. Daven 1931 triple format scanning disc receiver. (Early Television Foundation, Hilliard, Ohio, website)

The Television Manufacturing Company of America, located in New York City, built scanning disc television kits and complete receivers in a cathedral-style cabinet. The most noteworthy accomplishment of the company was a public relations event. In 1931, the company president, Mr. A. Pollak rented a storefront at Broadway and 52<sup>nd</sup> St. to provide six weeks of free demonstrations of the See-All models (Fig. 45). Crowds of the curious came through day and night.<sup>37</sup> The company's estimate of a half-million visitors viewing high-quality images may have been an overly optimistic report, as the 1932 line of new models, announced at the demonstrations, did not appear to be realized. This company made a valuable contribution to the art of television by demonstrating their receivers to the public, but it appears that the public saw television that wasn't ready for them.

The Pilot Radio Corporation in Brooklyn, NY, had roots going back to 1919 as a manufacturer of radio parts. They soon went on to produce popular kit radios such as the Wasp series of kits and plans. As the interest in radio grew, they began to produce a number of complete models. At the same time, Hugo Gernsback in New York City was the publisher of many popular technical periodicals, including *Radio News*. He was a long-time television enthusiast and published many articles and editorials promoting television development and started another publication, *Television News*. Convinced that as more people saw television it would gain acceptance, his organization also had a broadcast



Fig. 45. See-All scanning TV. (National Capital Radio and Television Museum, Bowie, MD)

station, WRNY, located across the river in New Jersey. When Gernsback wanted to add television broadcasting service to WRNY, he contracted to work with Pilot.<sup>38</sup>

Soon after testing, it was decided that higher output from the photocells was required. Researchers at the University of Illinois were contracted to build new larger tubes. Twelve-inch diameter tubes were constructed and claimed to be the largest made to that date.<sup>39</sup> WRNY was broadcasting to the New York City area from a transmitter in Coytesville, NJ, and Pilot was building disc televisions with a built-in Pilot receiver (Fig. 46).<sup>40</sup> It is unclear how many were made as there are no known surviving sets. *Radio News* published a list of the confirmed television broadcasting stations and their formats in 1929 (Fig. 47). In 1932, lists would show over 30 mechanical television stations on the air.

On the west coast, Don Lee, an early radio broadcaster in Los Angeles, was

## When Television was Just Around the Corner



Fig. 46. Pilot scanning disc television under construction. (Edgar H. Felix, *Television, Its Methods and Uses*, p. 144)

also a mechanical television broadcaster. His young engineer, Harry Lubcke, who had worked for Farnsworth, had the job of building the television station. Transmission began with 80 lines at 15 frames

per second, broadcast on shortwave as W6XS, in 1931. The company published plans for experimenters to build their own receivers. Although latecomers to mechanical television, the company soon became an early electronic television broadcaster.

In England, the Scophony Company developed a mechanical television display that reached the rate of 405 lines. This was made possible by an invention by J. H. Jeffree named the Jeffree cell. It was able to modulate a light source 200 times brighter than was possible with the Kerr cell that was being used by others. The display used special lenses and two mirror wheels moving at high speed. With the additional light intensity, the display could project an image of acceptable brightness at the higher line rate.

### Television Broadcasting Schedules

**T**HE stations listed below are known definitely by Radio News to have television transmitters. Because of the temporary confusion into which the American broadcast stations have been thrown by the new wavelength-allocation order, complete hour-by-hour schedules cannot be printed in this issue. Consult your local newspaper for last-minute changes.

WRNY, Coytesville, N. J.: 297 meters; single-spiral, 48-hole disc, 450 r.p.m.  
 W2XAL, same location and schedule as WRNY: 30.91 meters.  
 WCFB, Chicago, Ill.: 309 meters; single-spiral, 48-hole disc, 900 r.p.m.  
 W3XK, Washington, D. C.: 46.72 meters; Jenkins "radio movies"; can be picked up with single-spiral, 48-hole disc, 900 r.p.m. From 8.00 to 9.00 p. m., E. S. T., on Monday, Wednesday and Friday nights.  
 W1XAY, Lexington, Mass.: 61.5 meters; television and "radio movies"; single-spiral, 48-hole disc, 900 r.p.m.  
 WGY, Schenectady, N. Y.: 380 meters; single-spiral, 24-hole disc, 1,200 r.p.m. Also W2XAF, 31.40 meters, and W2XAD, 21.96 meters, associated with WGY.  
 W1BO, Chicago, Ill.: 526 meters; three-spiral disc, 15 holes per spiral, 900 r.p.m.; Sanabria system.  
 WMAQ, Chicago, Ill.: 447.5 meters; three-spiral disc, 15 holes per spiral, 900 r.p.m.; Sanabria system.

A number of other stations in various parts of the country are supposed to have television transmitters in operation; but are not listed above because they have not answered, or even acknowledged, telegraphed requests from Radio News for information about their apparatus.

Fig. 47. Television broadcasting schedules of 1929. (*Radio News*, Jan. 1929, p. 631)

This development, coming in 1938, had a short life as electronic television was replacing all mechanical systems.

### **End of the Boom**

During the 1928 to 1934 television boom, a number of factors were coming into play that would change the fortunes of mechanical TV:

- The depression reduced investment capital.
- Experimental television stations were not permitted to generate revenue by advertising.
- The entertainment quality of the broadcasts was unacceptable to the public.
- Advances occurred in electronic television.
- Changes at RCA made small independent research unnecessary.

Although it would first seem that there would be no connection to the mechanical TV business, changes began to take place at RCA (Radio Corporation of America) that would change everything in the way RCA did business, including how RCA related to the rest of the radio electronics business and the development of television. From the beginning of broadcast radio, RCA marketed radio receivers built by Westinghouse Electric and Manufacturing Co. and the General Electric Corporation. How this relationship evolved is more than a chapter in radio history but it also caused a chain of events that would impact television history. During this time in the 1920s, both GE and

Westinghouse did their own research in television. Also, during this time RCA was holding the patents for many of the circuits required to build competitive radios. The most important of these was the superheterodyne circuit of Edwin Howard Armstrong, and RCA declined to license this, and other patents, to the rest of the industry. This and other factors brought pressure from federal regulators to deal with what was referred to as the Radio Group (mainly RCA, GE, Westinghouse, and some others) as a monopoly.

As David Sarnoff rose to power at RCA, it was his responsibility to relieve some of the pressure from government investigators. RCA had to change the way they did business. The first of these changes involved RCA beginning their own manufacturing. To start this, RCA purchased the Victor Company in Camden, NJ, and RCA Victor was born. David Sarnoff was now in control of manufacturing radios for RCA and he began a research department in Camden. Sarnoff was very public about his views on television. He was sure it would be the next big thing and that RCA would be the leader in the field. RCA began television research in coordination with work by Alexanderson at GE and Zworykin at Westinghouse.

The government regulators still were not satisfied with the changes. Sarnoff agreed to license all of the patents in the RCA patent pool to all others in the radio business that could afford the fee. This soon brought most of the industry into the RCA fold either directly, or, for a small company, under a larger

## When Television was Just Around the Corner

company's license. The settlement with the government also included GE and Westinghouse divesting all of their interest in RCA. Sarnoff was able to move Zworykin and his team to RCA.

The 1930s and the depression brought hard times to the entire radio industry as well as RCA. This did not stop Sarnoff from advancing the work on television. He had the power to direct the company in this direction and he had the reputation of success and the confidence of stockholders that allowed him to make huge expenditures of Table 1 on television research.<sup>41</sup>

This amount in 1930 dollars dwarfed the research budget of the other organizations at the time. Also, for the same time period, research funding for research by Farnsworth was only around \$1,000,000. Allen DuMont's new company could spend only \$300,000 on research.<sup>42</sup> By comparison, these numbers overwhelmed the amounts available to the small mechanical TV companies. In reviewing the documents provided by Shortwave and Television Co. (Hollis Baird), the value of the entire company never exceeded \$70,000. The De

Forest-Jenkins Company could not find the buyers for their receivers and soon filed for bankruptcy. The assets were bought by RCA.

This huge effort by RCA could make a small company wonder why they should fund any television research. If a company was producing a television with a receiver under an RCA license, the results of RCA's research were available for your use.

As the 1930s came in, Sarnoff and RCA put their television research funds to good use. The decade would bring a series of field tests from the new Empire State Building and the new transmitters perched at the top. This period of research started at RCA Laboratories in Camden, NJ. It would be the most comprehensive research into creating a commercial television broadcast to date. It began by investigating something that mechanical TV inventors tried to ignore. Research began into learning what was required to create an acceptable, satisfactory commercial television system that would have the entertainment value to inspire the radio listeners to buy a television receiver for themselves.<sup>43</sup> Research

**Table 1. Television development expenditures by RCA, 1930–1939. (Author)**

Cost and expenses for patents and patent rights	\$ 2,124,000
Research and advanced development	2,651,000
New York field tests, equipment, engineering and technical operation	1,494,425
Related manufacturing operations	2,170,547
Expenses related to development of TV programs	813,751
Total expenditures by RCA	\$ 9,253,723

## When Television was Just Around the Corner

cut off while the deflection circuits move it into position for the next line. This has to happen in both the horizontal and vertical movement of the beam. For this reason, additional spaces had to be added between holes in the disc to allow some dead time for the CRT to perform horizontal retrace. Another space was added between the last hole in the spiral and the first hole in the spiral, for the vertical retrace.<sup>47</sup>

The television receivers built by Zworykin were an advance on the receivers built when he was at Westinghouse in East Pittsburgh. Now at 120 lines with a 9-inch cathode ray tube, it had electromagnetic deflection and was built into a radio-style cabinet (Fig. 48). Due to the length of the CRT, the glass tube was mounted vertically with a mirror attached to the lid, angled to project the image to viewers comfortably seated.<sup>48</sup> The image quality was greatly improved over a 60-line scanning disc image. In addition to the improved line rate, the phosphor screen also reduces the

appearance of the scanning lines. The TV model Felix the Cat is starting to look better (Fig. 49)!



Fig. 48. RCA prototype CRT television receiver used in a field test, 1932. (Darryl Hock collection)



Fig. 49. TV model Felix the Cat in 60 and 120 lines. (Irving Settler and William Laas, *A Pictorial History of Television*, pp. 40, 41)

### The End of Mechanical TV

When Jenkins broadcast his "radio movies," he asked viewers to mail in a confirmation report. We could assume the dedicated experimenters were happy to respond. In his book, Jenkins listed all of the loyal fans on one page. There were only 30 names. Surely the true believers would keep watching and perhaps buy or build better equipment, but they could never support mechanical television as a commercial business. Ultimately having some entertainment value to capture the interest of the average radio fan was necessary.

In an interview, RCA engineer Ted Smith, who was responsible for the construction of the RCA mechanical TV station W2XBS, told this story of a TV demonstration. Their equipment was set up in a Manhattan theatre. The VIP in attendance was David Sarnoff. The demonstration played on a large screen set up on the stage. It was a successful demonstration of the highest viewing quality they could achieve at that date. Smith watched Mr. Sarnoff and party view the presentation. When they left, Smith reports that they dismantled the equipment, took it outside the theatre, and placed it in the trash. It had been obvious to all that this technology would never meet the standard of an acceptable television service.<sup>49</sup>

In 1927, Ernst Alexanderson wrote an article in the February 1927 issue of *Radio News*. In the article, it appears at this stage of his research, he has come to understand what would be required for a quality television system. He points out that he has had success sending quality

still images, but for a 16 frame per second moving image of the same quality, he would have to send that image in 1/1000 of the time of sending the still image. He doubted that the devices he had to work with could ever do that job. He then rationalized that if a person only wants to see the moving image of a friend that he can see and recognize, then mechanical TV is capable of that job. He estimated that the mathematics of the requirements for real television are predicting a need for very large bandwidth, unheard of at that time.<sup>50</sup>

In 1932, Philo Farnsworth took his electronic television equipment to England for a demonstration prepared for the Baird Corporation. Farnsworth's wife attended the demonstration and she gave this remembrance, "As he came through the door, Mr. Baird caught sight of the picture on the monitor [of Farnsworth's system] and became silent. He stood there for a time. Then, breaking the spell with a visible effort, he turned without a word and left. With great empathy Phil watched him go, aware Mr. Baird had seen the death knell of his beloved spinning disc."<sup>51</sup>

In the 1933 interview, Paul Nipkow was asked about the progress on mechanical televisions using his discs. Although he recognized some improvements, he said more, "If I am not mistaken, however, the Braun tube, the long glass tube with the deflected cathode ray, has the most prospect for practical realization."<sup>52</sup> The inventor of the scanning disc was not mistaken.

However, the electronic commercial television system that was introduced at

## When Television was Just Around the Corner

the 1939 World's Fair did not mark the end of a motor being used in a television receiver. In 1950, color television receivers were built that incorporated a monochrome CRT mounted behind a spinning disc of red, green and blue color filters. Once again, the eye's persistence of vision would produce a realistic color picture.

Decades later, a small television camera with a spinning color filter brought us the first color television from the Apollo 12 astronauts on the moon. In the 1990s, when plasma TVs were too expensive and before flat LCD TVs became affordable, many DLP TVs were produced. These TVs, using Digital Light Processing chips, filtered intense white light through an assembly with a small spinning color wheel and the digital chip before sending the image to a rear projection screen.

It doesn't seem likely that we will need motors in our televisions in the future. As the technology of computers, software, the internet, and video displays continue to advance, it becomes more of a challenge to describe the device we are watching as a "television." However, it is important to understand "how we got to here" and the decade of mechanical television systems and the men who built them is an important part of that story.

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## Acknowledgements

Without the resources provided by three organizations, preparing this article would have been extremely difficult for me and they deserve my thanks for making this article possible. These organizations consist of people working not for profit, but rather to preserve the history of radio and television, and to tell the stories of the scientists, engineers, technicians, and businessmen who made it happen.

The Early Television Foundation with a Museum in Hilliard, Ohio, as well as their website, [www.earlytelevision.org](http://www.earlytelevision.org), run by Steve McVoy, is an enormous resource for anyone interested in early television and television broadcasting.

The Antique Wireless Association not only publishes this collection of articles, but also runs the AWA Museum in East Bloomfield, NY. The Museum, along with the AWA Library, is not only a great resource for historians, but also actively brings this history to the next generations through their educational programs. See: [www.antiquewireless.org](http://www.antiquewireless.org).

The website [www.worldradiohistory.com](http://www.worldradiohistory.com) has become an immense and indispensable archive of information on radio and television history with a collection of scarce periodicals and books instantly available.

## When Television was Just Around the Corner

### About the Author

Author **Mike Molnar** has been an engineer working on nuclear medicine equipment for 44 years; the last 39 with his own company. Mike has also been collecting and studying antique radio, TV, and other electronic items for over 50 years. Mike has promised

his understanding wife, Pam, that the time has come to start cutting back on his work responsibilities in order to do more of the things they enjoy. Mike's wife does not believe him. Simply to prove her wrong, he plans to spend more time with his assistant, Lila, hunting for more electronic fossils.



Author Mike Molar (right) and his assistant, Lila, stepped from this picture into an analog abyss. They found themselves in a 45-line triple interlaced quagmire, finally escaping from the magnifier of a Western Television Corp. "Visionette."