Television in the 1920s

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Sources

• Albert Abramson, *The History of Television, 1880 to 1941*
• Albert Abramson, *Zworykin: Pioneer of Television*
• George Everson, *The Story of Television*
• David and Marshall Fisher, *Tube: The Invention of Television*
• Jeff Kesseloff, *The Box*
• National Radio Institute *1927 Radio Correspondence Course*
• Struan Reid, *John Logie Baird*
• Michael Ritchie, *Please Stand By: A Prehistory of Television*
• Joseph Udelson, *The Great Television Race*
• Early Television Museum Website (www.earlytelevision.org)
Television Eras

- Pre-television (< 1920 – basic concepts envisioned)
- Mechanical scanning B&W television (1920 to 1935)
- Electronic B&W television (1930s to early 1950s)
- Analog Color TV era (Mid 1950s to 2000)
- Internet, digital HD flat panel era
Television’s Precursor Technologies

Before there was television, people first envisioned:

- Wired transmission of still pictures (facsimile)
- Then *wireless* transmission of still pictures
- Then *wireless* transmission of moving images
Television’s Precursor Technologies

For television as we think of it, one needs progress in photocells, optics, vacuum tubes, radio broadcasting, etc.
Who Invented Television?

Multiple inventors in

- England
- Germany
- Russia
- United States
- France
- Austria
19th Century Ideas (1)

Low resolution B&W still images via wires (telegraphy). Images broken down into pixels. Information about each pixel transmitted via a coded scheme.
Joseph May’s 1873 observation of the electrical response of selenium to light – the idea of using photocells to scan an image
19th Century Ideas (3)

If you can transmit the information from a frame fast enough, you can transmit moving images over wires!
If you can transmit moving images over wires, why not send the images wirelessly?
Television Milestones

• First use of the term “Television”?

• First book on the history of television?

• First color television patent?
Television Milestones

• First use of the term “Television”? Constantin Persky, Paris 1900

• First book on the history of television? 1911

• First color television patent? 1904
19th Century Ideas (5)

Karl Braun invents the cathode ray tube - 1897
Envisioning Electronic Television

Following Braun’s invention of the CRT, Alan Archibald Campbell-Swinton envisioned all-electronic television in 1911, with cathode ray devices at the transmitter and at the receiver.
Envisioning Television

Paul Nipkow: Concept of mechanical scanning of image with a rotating disk (1884)

The cell is linked to a lamp, which varies in brightness according to the strength of the electrical signal.

Light from the object passes through a spinning Nipkow disc to a photoelectric cell.

A second Nipkow disc spins at exactly the same speed as the first. Light from the lamp shines through holes in the discs onto a screen. All the fragments of light are blurred together to look like a complete image of the object.

The photoelectric cell turns the energy in the light into electrical signals. Strong light produces a strong electrical signal and weak light produces a weak one.
Television in the 1920s

The image produced by a scanning disc with progressive scanning.
Scanning Disc TV Scheme
Television Pioneers

Max Dieckmann (Austrian)

Television patent in 1906 (using CRTs to display images)
Television Pioneers

Boris Rosing

Russian television patent in 1907 (with CRT display)
Television Pioneers

John Logie Baird (England)

His 1st television patent: 1923 (scanning disc)
Television Pioneers

C. Francis Jenkins (US)

His 1\textsuperscript{st} television patent: 1922
(scanning disc)
Television Pioneers

C. Francis Jenkins

Television station W3XK on Georgia Ave.
Television Pioneers

Philo Farnsworth

Farnsworth with 1928 image dissector (camera) tube
Cover of

All About Television

Published 1927
Television in the 1920s

The image produced by a scanning disc with progressive scanning.
Television in the 1920s

A disc used for interlaced scanning
Television in the 1920s

Transmitter

Receiver
Television in the 1920s

Typical 1920s scanning disc apparatus
1920s Television Transmission

Two receivers needed:

- Sound usually transmitted in the AM broadcast band

- Picture (AM) usually transmitted in a low-frequency shortwave band, e.g. 1.6 to 3 Megahertz
Lack of Standards in the 1920s

- Lack of agreement on:
  - Number of lines and number of frames per second
  - Sequential vs. interlaced scanning

- Synchronization by relying on synchronous electric motors tied to same electric grid
U.S. Companies Engaged In Television Research or Manufacturing, Circa 1930

- General Electric
- AT&T
- Westinghouse
- RCA
- Jenkins (DC area)
- Shortwave and Television Laboratories (Boston)
- Western Television (Chicago)
- Farnsworth (San Francisco)
- Others (Echophone, etc.)
Television in the 1920s

Westinghouse (Later RCA)

Vladimir Zworykin with photocell, circa 1925
Television in the 1920s

Westinghouse

Zworykin’s camera tube, circa 1925
Television in the 1920s

Westinghouse

Zworykin with 1929 Westinghouse prototype TV set
Television in the 1920s

General Electric
Ernst Alexanderson
with projection TV apparatus
(W2XAF, 8-MHz demo in 1928)
Television in the 1920s

General Electric

Prototype TV set
Television in the 1920s

General Electric

First televised drama
(September 1928)

*The Queen’s Messenger*
Television in the 1920s

RCA

NBC/RCA’s television station W2XBS
(CBS had W2XAB on the air 1931-32)
Television in the 1920s

RCA

60-line RCA TV, circa 1929
Television in the 1920s

Bell Labs/AT&T

Herbert Ives, with large display. (AT&T used a flying spot scanner)
Television in the 1920s

Secretary of Commerce Hoover on TV in 1927

(AT&T wired demo)

Washington to NYC
Television in the 1920s

Western Television (Chicago)

Western Television, typical model
Television in the 1920s

Shortwave and Television Laboratories, Inc. receiver for home use (W1XAV – Hollis Baird)
Trans-Atlantic Television in 1928

- John Logie Baird wanted to demonstrate trans-Atlantic television
- February 1928 – Baird’s assistant Ben Clapp traveled to Hartsdale, NY, and received moving images from Baird’s station 2UK; sound from station 2KZ
- Thirty-four years later (1962), thanks to Telstar, trans-Atlantic television again took place
- Today, optical fibers and satellites make world-wide TV possible
Example of an Educational TV Station: University of Iowa’s W9XK

1931-1939 Lectures on Constellations, Shorthand, Identifying Trees, etc.
Mechanical Television Dies

- The Depression killed consumer demand, companies bankrupt
- Scanning disc images: too small, low resolution
- By the mid-1930s, electronic television (camera tubes and CRTs) looked promising
Mechanical Television Replaced by Electronic TV

- RCA and DuMont began to sell electronic television sets in 1939
- RCA began regular TV broadcasts at the World’s Fair in April 1939
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1931 Daven

1931 See-All
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