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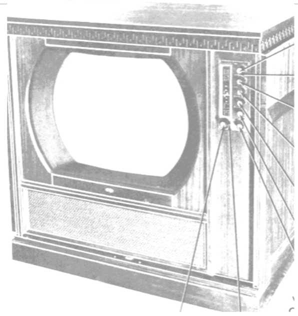
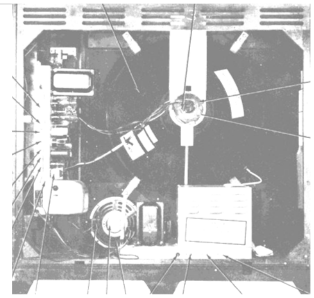




WHAT'S NEW IN OLD TVS

The Newsletter of the Early Television Foundation

Greetings Early Television Fans,

This is Volume 2, Number 9 of the Early Television Foundation Newsletter. **The September Zoom meeting will be on Saturday, September 27th at 8 PM.**

During the August zoom meeting, Steve McVoy told us of a new development at the museum. Now, visitors can view early television technology as well as pick up their fruit and vegetables for the week. Yes, the ETF has agreed to host a farmer's market and reap a few dollars at the same time. He also tells us that sweepstakes sales were coming in and he is confident we will reach the minimum sales needed. He is also looking for volunteers to help at the museum during the tailgating weekend. In this months newsletter we have part two of an article by James T. Hawes. He tells us the story of VinylVideo, the attempt to add video to a 45 RPM record. Also, Robert Ring will tell us about the DuMont Royal Sovereign, the black and white console TV on growth hormones. Read what makes the big guy stand far above the rest of the TV competition.

We want to hear from you !

newsletter@earlytelevision.org

Editors: Mike Molnar & Robert Ring

Get Your SWEEPSTAKES TICKETS NOW !!

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.

The DuMont Royal Sovereign, TV for those “special people”

DuMont

"First with the Finest in Television"

and first prize in the ETF 2025 sweepstakes

Most Americans buying a TV set in 1951 might choose something like an RCA 9-T-77, however, there were others who felt the need for a larger dose of "Conspicuous Consumption" For those buyers at the top end of that consumption, there was the Dumont Royal Sovereign. With the largest Black and White picture tube ever made, it was a true marvel of engineering. If you were in the market for such a set, but you were a comparison shopper, here is what you would find:

Manufacturer	DuMont RA-119A	RCA 9-T-77
Tubes (inc.CRT)	45	22
Height	50	29
Width	49	40
Depth	26.25	27.5
Weight	470 lbs.	135 lbs.
Picture Tube Size	30 inches	19 inches
Sq. inch viewing	423	204
Price	$ 1,800.00	$ 175.00
Price 2025 $	$ 21,000.00	$ 2,209.00

The Dumont RA-119A Royal Sovereign has a direct-view, 30-inch, 30BP4 CRT, giving it by far the largest screen size of its day, and making it the largest screen direct-view black and white TV ever produced. Like many early DuMont sets, it has a continuous tuning 44-217 MHz tuner which covers the VHF low, FM radio, and VHF high bands in a single range. A 6AL7GT eye tube is used as a tuning aid.

The RA-119A uses a regulated pulsed RF transformer with voltage doubler to supply 22 kV to the CRT anode. The RF of the HV supply oscillates in sync with the horizontal sweep but is otherwise independent of the sweep circuitry. Regulation (unusual in black and white sets) is accomplished by sensing the HV via a voltage divider with a 500 megohm resistor and comparing it to a 75 volt 0A3 voltage reference tube. A 6SJ7 control amplifier and 6W6GT control tube are used to adjust the screen voltage on the dual 6BG6G HV pulse amplifiers that drive the HV transformer.

WANT ONE OF YOUR OWN ! Buy your tickets NOW !!!!

TV Tubes Get Bigger...

Larger TV screens are featured in most current telesets, with 14- to 19-inch tubes getting the biggest play. General Electric promises a 24-inch set for this fall, and Du Mont is showing the giant 30-incher above. It's the largest direct-view set to date, has 536 square inch picture area, and is suitable for restaurants, clubs, schools, and other public places.

30 *inches!*

THE WORLD'S LARGEST TELEVISION PICTURE TUBE

Another Du Mont first

From the laboratories that have made possible television itself . . . from the endless research that for twenty years has pioneered each step on the road to ever bigger and better pictures . . . comes the magnificent Du Mont *Royal Sovereign* . . . with its giant 30-inch tube . . . ushering in a new era in the beauty, power and glory of television. This Teleset* embodies on an unrivalled scale all the famous and exclusive Du Mont advantages . . . all the features that combine to produce the incomparable performance that is the hallmark of Du Mont.

*Trade Mark

CABINET BY HERBERT ROSENGREN

The ROYAL SOVEREIGN by Du Mont, with 526-square-inch Lifetone* picture on a 30-inch direct-view tube. This distinguished Du Mont Teleset* has 46 tubes (including cathode ray tube and 6 rectifier tubes). FM radio and phono-jack. Cabinet dimensions: 48" high, 50" wide, and 27½" deep. Mahogany.

20th YEAR AS PIONEER

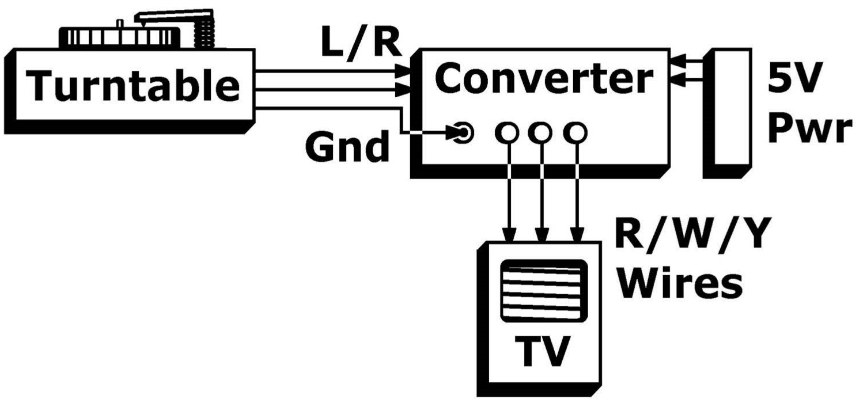
first with the finest in Television **DU MONT**

Introduction

Part 2 of Our Series on Video Recording

Slide a single onto the turntable! Now watch. Not the record, but pictures! Here's Part 2 of our *VinylVideo* series. Let's review Part 1: What did *VinylVideo* do? It spun vinyl records into video and sound. What was *VinylVideo*? It had four aspects: ▪Something old: *45 rpm records.* ▪Something new: *A converter box. (In went audio from the record. Out came audio and video.)* ▪Something borrowed*: A stereo cartridge.* ▪Something blue: *A diamond stylus.* In Part 2 of this article, we contrast *VinylVideo* with *Phonovision*. ***–James T. Hawes, AA9DT***

Part Two Follows.



***VinylVideo*: Interboard connection diagram**

VinylVideo & Phonovision

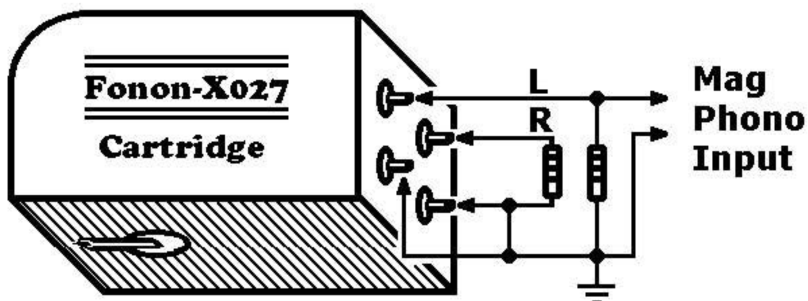
TV Pictures from Audio Records

Success & Failure

by James T. Hawes, AA9DT

Playing Back Images & Sound

Phono cartridge type. *VinylVideo* required a stereo cartridge. The cartridge could be either a magnetic or a moving coil type. The *VinylVideo* converter didn't accept ceramic or piezo crystal cartridges. Yet adapting such cartridges to the magnetic inputs might have been possible. (The author *hasn't tested* such methods.) For the ceramic cartridge, an experimenter might load down the cartridge. A typical load would be a 1K resistor bridging the cartridge's signal and ground leads: Two resistors for a stereo cartridge: One resistor per channel. (Brice 2018, 9:30-9:54; Brice 2021) For the crystal cartridge, each channel would need a one-FET source follower. (Example: Hawes 2020, Fig. 3.) An adapter shouldn't connect directly to the back of the cartridge. Instead, the adapter should be in a shielded, metal box. Such adapters might match a cartridge to the magnetic preamp inputs. But these adapters *couldn't* improve the cartridge's frequency response. For *VinylVideo,* Supersense recommended a 20 Hz to 20 kHz response. (Supersense 2016, 16)



Theory drawing: loading ceramic cartridge with resistors

Non-Record Sources. A user could dub a *VinylVideo* single onto a cassette or cell phone. Then the converter box would allow playback from the tape or phone. (*With cassette*: Taylor 2018b, 1:21-2:11; *with cell phone*: Taylor 2018b, 2:20-3:06)

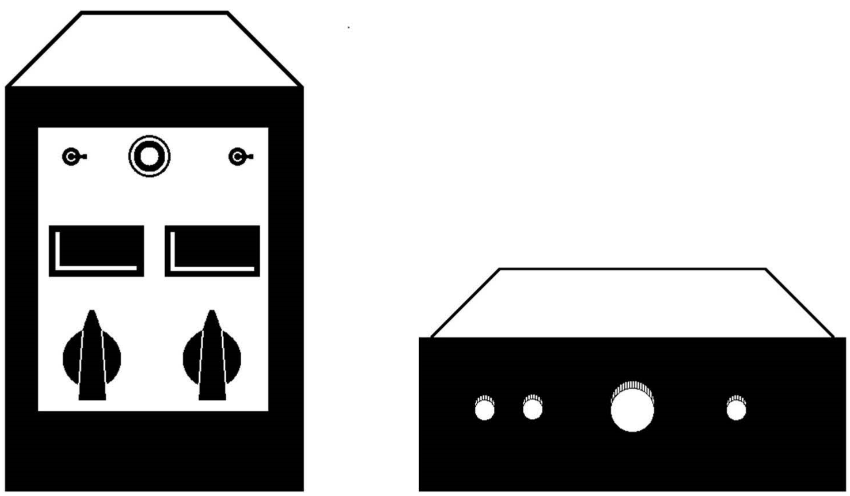
Flyback interference. For those who used a CRT video monitor or television: Separating the monitor (*TV set*) and phono turntable was necessary. Otherwise, the phono cartridge could pick up the radiated signal from the monitor's flyback transformer. This signal could interfere with the picture or sound. (Supersense 2016, 15)

RF & SCART Adapters. The *VinylVideo* kit didn't include adapters for RF and SCART. If a TV required one or the other adapter: The user would have to buy the adapter separately. (Supersense 2016, 6)

Availability of *VinylVideo*

Out of Production. As of press time: The *VinylVideo* converter is out of production indefinitely. (Just the same, *VinylVideo* may rise again, as it did in 2016 or so.) The Heavy Metal record set is unavailable. Queries about obtaining *VinylVideo* SD cards, and custom record-cutting services met with no response. Used *VinylVideo* equipment or records might be available, likely from European sources. (The author has *no connection* with such potential sources.)

How to identify the two *VinylVideo* converters: A collector can tell the difference between *VinylVideo* models by examining the converter boxes. The early model looks like an industrial test instrument, complete with a louvered, metal case. Its shape is a vertical rectangle. Notice the two chicken head knobs and a pilot light on the front. (Rowell 2000) The later converter looks like a piece of high-fidelity equipment from the mid-1970s. The converter box is black, with a white *VinylVideo* logo. The shape of this later converter is a horizontal rectangle. There's one knob, front and center. (Taylor 2018a, 4:22-5:14)



***VinylVideo* converters: Left, early version. Right, later version**

Record Market. Meanwhile, there may be a collectible market for used *VinylVideo* records. Here's the story: During the art show phase of *VinylVideo*, a Czech Republic pressing factory produced *VinylVideo* records. *VinylVideo* records came off the stamper at Gramofonove Zavody at Lodenice. ([Best Before?] 1998a) The press runs were short (*10 copies per title*): As befits parallel art forms, such as graphic printmaking. (Berwick 2000)

During the Supersense phase, record releases remained small, but there were no pressings. Instead, Supersense cut records direct-to-vinyl. (Spice, 2018) Each record would differ slightly from other copies of the same title. Author's opinion: The limited production of records and hardware suggests the status “scarce and collectible.” But these aren’t your record shop “dollar singles.” More like “top dollar singles.”

VinylVideo vs. Baird *Phonovision*

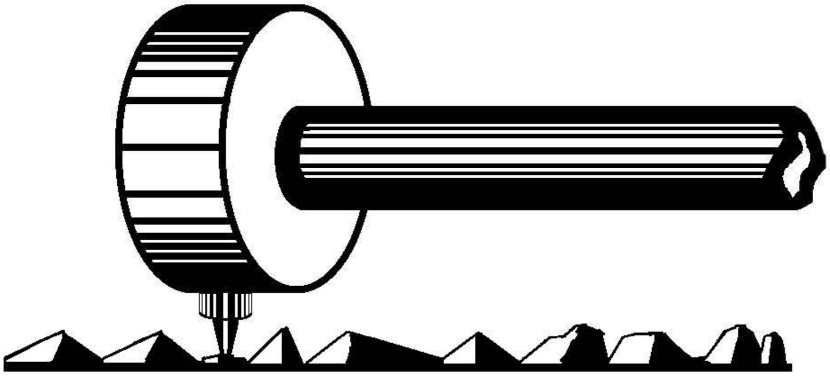
Is *VinylVideo* another “Baird *Phonovision*”? No. Unlike *Phonovision*, *VinylVideo* played back video, not just audio. (Dinsdale 1932, 71-73; Moseley and Chapple 1933, 142-146; Taylor 2018a, 7:32-8:38, 9:11-10:00)

We know about *Phonovision* from the surviving shellac records, photos, and published material, including patents. Unfortunately, the photos and published material are often unreliable sources. But they’re the best we can do. Apparently, no *Phonovision* recording equipment or *Phonovisor* record players exist today. Fortunately, Donald McLean’s research sheds new light on *Phonovision*. (McLean 2000, 65, 67-70)

The term *Phonovision* covers two late-1920s technologies: (1) The jerry-built setup in Baird’s shop, which some accounts rhapsodize as “Baird’s *Phonovision* recording studio.” (2) The *Phonovisor* patent, in which Baird superficially described a fantasy portable player for *Phonovision* records. The depicted player would have required an amplifier that wouldn’t fit in the case. (McLean 1998, 823, 827; Baird 1929)

***Phonovision* wasn’t a videodisc.** Calling *Phonovision* a “videodisc,” or “video recorder” as some historians do, is hyperbole at best. The *Phonovision* video output was audible, but not viewable. (Besides the video track, the extant *Phonovision* records contain no speech, music, or sound effects.) Unfortunately, Baird’s imprecise recording methods hopelessly scrambled the images.

The *Phonovision* setup in Baird’s shop closely resembled an Edison hill-and-dale recording apparatus. Baird simply added gears to power (and sync) the turntable. As with Edison’s record player, the *Phonovision* input and output signals were both audio.



Tracking hill-and-dale groove *(not to scale)*

But Baird knew how to turn a lemon into lemonade: Instead of attempting to present his jumbled *Phonovision* video, Baird publicly demonstrated its audio. Something of this sort: “Did you ever hear a human face before? Just listen. Amazing! Imagine being able to see the face that these sounds represent. You could play back your favorite programs whenever you want. That’s what’s coming to your home soon. Another wonder of science from Baird Television!”

“Selling the sizzle,” Baird’s publicity stunt worked! It drew raves from popular technology magazines. *Modern Mechanics* ran a whimsical article with an illustration from *Might-Be-World*. Here was an undemonstrated Baird *Phonovisor* that probably never existed. The magazine’s fabrication even projected pictures of Al Jolson in *The Jazz Singer*! A mythical projection *Phonovisor* also appeared on the June 1927 cover of *Radio News*. Here, the viewer was watching a prize fight. (*Like Edison records:* Abramson 1955, 41; Frow 1982, 40, 271-272; McLean 1998, 823, 826-827; McLean 2000, 60-62, 80-81, 87-90, 135, 156, 162; Dunlap 1932, 75; Baird 2004, 64; *no soundtrack:* McLean 2000, 71-72; *publicity stunt*: “Home Movies from Phonograph Records”; McLean 2000, 90, 170-171; Burns 1998, 175; *Phonovisor in print*: “Home Movies”; Dinsdale 1927, cover)

Low-def TV. Like *Phonovision*, *VinylVideo* was low-definition television. Yet *VinylVideo* had higher resolution than *Phonovision* had. (*VinylVideo*: 84 lines, vs. *Phonovision*, 30 lines). Also, *VinylVideo* operated at twice the frames-per-second rate: Eight fps, vs. *Phonovision’s* four or so. During its early development, *VinylVideo* displayed frames at a rate closer to that of *Phonovision*. At last, a breakthrough between 1995 and 1998 achieved eight fps. (Taylor

2018a, 10:30-10:38; Diamant 2025c; McLean 2000, 137-138, 165; Burns 2000, 125-126; [Best Before?] 1998c, [5?])

Equalization. *Phonovision* records *didn't* use the RIAA equalization curve. The same would be true for Baird's experiments using cylinders instead of flat records. Reason: The RIAA curve standard only dates to 1954, long after Baird's *Phonovision* experiments. But *VinylVideo* did adhere to the RIAA curve, both for recording and for playback. (*Phonovision*: McLean 2000, 106-107; Sheldon and Grisewood 1929, 130-131; Hobbs 2025; *VinylVideo*: Diamant 2025b)

***Phonovision* standards.** On a 78 rpm record, *Phonovision* recorded three video frames per revolution. (Recording rpm might have been as high as 80.) The records were 10 inches across and single-sided. Frames scanned vertically.

Baird's shop *Phonovision* rig used a Nipkow mechanical video camera, *not* a flying-spot scanner. The floodlight for the camera was an infrared source. (This setup was an example of Baird "Noctovision.") (*Turntable rpm:* Burns 2000, 125-126; McLean 2000, 137-138, 165; *record diameter, single-sided*: McLean 1998, 824; *vertical scan:* Waltz 1932, 84-85; McLean 2000, 43-44; *Baird's shop equipment:* McLean 2000, 137; McLean 1998, 827)

The *Phonovision* turntable in Baird's studio didn't have its own motor. Instead, the scanning disc motor rotated the turntable through a three-to-one reduction gear. The single motor and geared turntable drive provided horizontal sync for the video. McLean notes that this mechanical sync method was unreliable. According to period sources, *Phonovision* used a typical, direct-drive scanning disc. The scanning motor was synchronous. (*Gearing & sync:* Burns 2000, 126; McLean 2000, 72-73, 102, 137-138, 165-167; McLean 1998, 825, 827; *scanning disc & motor:* Dinsdale 1932, 72; Moseley and Barton Chapple 1933, 3, 143, 145)

Some *Phonovision* math. Using Formula 1 (below), McLean could determine turntable speed in revolutions-per-minute (*rpm*). With Formula 2, he could determine how many frames-per-second (*fps*) that *Phonovision* would produce. (Burns 2000, 126; McLean 2000, 137-138; McLean 1998, 827)

Important difference between *Phonovision* and *VinylVideo*: Formula 2 (the fps formula) applied to Baird's shop *Phonovision*, but not to *VinylVideo*.

Here's why: The shop *Phonovision* mechanically linked a video scanning disc and the recording lathe. There was no such mechanical link in *VinylVideo.* (Diamant, 2025c)

Turntable, Scanner, & Motor Formulas
Formula 1: Turntable speed
Turntable rpm= (Scanner rpm / Gear ratio) **EXAMPLE: (240 / 3)= 80 rpm**
Formula 2: Fps at turntable
Frames-per-second= (Frames-per-revolution x Turntable rpm) / 60 seconds per minute **EXAMPLE: [(3 x 80) / 60]= 4 FPS**
Formula 3: Scanner, number of poles for synchronous motor
Number of poles= (Line frequency x 120) / Sync motor rpm) **EXAMPLE: [(50 x 120) / 240]= 25 poles (Motor *not available*)**

Synchronous motor speed at the scanning disc would depend on the number of motor poles. Formula 3 (above) would find the number of poles. To review, McLean assumes that the Phonovision records rotated at 78 to 80 rpm. This range may be too narrow, due to available motors in the UK. For example, 80 rpm turntable rotation would require a 240 rpm motor. Unfortunately, in 50-Hz countries such as the UK, 240 rpm synchronous motors were (*and are)* unavailable. The nearest speeds would be 250 and 230 Hz. See the table below. (Miller and Miller 2004, 40, 176)

Scanning Motor Details (*50-Hz Countries*)

Turntable Speed, rpm	*Phonovision* fps	Scanner rpm	Motor, No./Poles	Available Motor?
83.3	4.16	250	24	Yes
80	4.0	240*	25*	No*
78	3.9	234*	25.6*	No*
76.9	3.845	230.7	26	Yes
*Number of poles *must be* even integer. Otherwise, motor is unavailable.				

***Phonovision*, desired bandwidth.** Mechanical television (*MTV*) engineers invented a bandwidth formula. The formula measures the MTV frame in hole widths. We'll call one hole width an *HW.* Please see the table below.

Applying this formula to *Phonovision*, we arrive at 4,200 Hz. (Hathaway 1936, 87-88)

MTV Bandwidth Formula
[(Frame width in HW x Frame height in HW x fps) / 2]* EXAMPLE: Phonovisor bandwidth= [(30 x 70 x 4) / 2]= 4,200 Hz
***KEY: HW= hole width; fps= frames-per-second.**

So much for the ideal bandwidth. Real-world *Phonovision* records conformed to a narrower band, running from 100 to 4,000 Hz. The response curve was a terrible haystack shape, with its peak at about 800 Hz. There were no low frequencies. This pathetic response curve may have been the fault of acoustic coupling. That is, between speaker and microphone, instead of electronic coupling to the wax master cutter. (McLean 1998, 826; McLean 2000, 166)

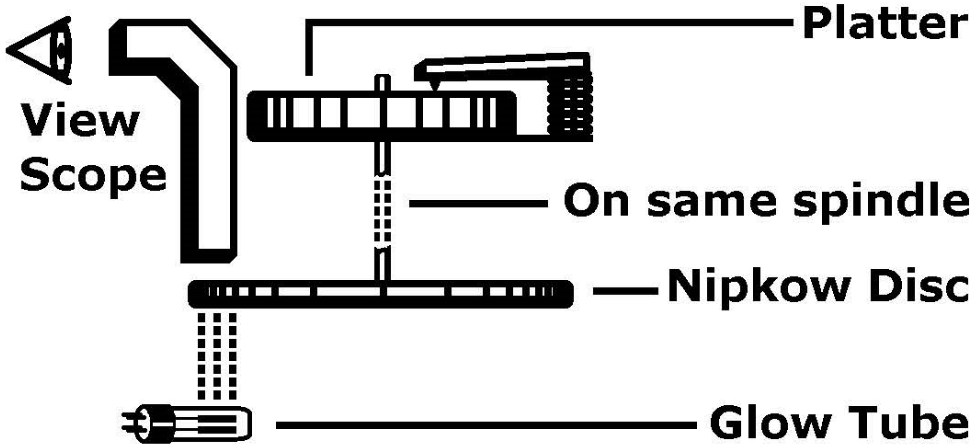
Columbia Graphophone Company pressed some *Phonovision* records. *Phonovision's* dreadful response curve suggests a related thought experiment: Imagine that a Baird technician recorded a wax *Phonovision* record in Baird's shop. What if he brought the record and an *acoustic* (mechanical) phonograph to the Columbia facility? This player would be easier to transport and set up than Baird's makeshift shop equipment. And no need to connect the scanner motor to the Columbia lathe.) Then the horn on the player would excite the microphone at the cutting lathe. The cutter output would assume the horn's audio characteristics.

Support for our thought experiment. Baird used Edison, or Edison-compatible phonograph equipment. Edison only released an electronically amplified phonograph in late 1928. The recovered *Phonovision* records bear date stamps between September 1927 and March 1928. During this time span, no Edison electronic record player was available. Then, use of an acoustic player would be likely. Another way to achieve similar results: The technician would cut a wax record in Baird's shop. The Columbia studio engineer would use this wax record to make the master. (*Baird's Edison equipment:* Josephson 1959, 469; Abramson 1955, 41; r*ecord release dates:* McLean 2000, 134; McLean 1998, 824; Burns 2000, 125)

In contrast: *VinylVideo* records had a much wider and flatter bandwidth than did Phonovision records. The *VinylVideo* converter was capable of 20 Hz to 20 kHz. (*Phonovision acoustic coupling*: McLean 2000, 71, 166-167; Frow 1982, 232-233; *VinylVideo bandwidth*: Supersense 2016, 16; Diamant 2025c)

Consumer *Phonovisor* Design

The video player that never was. Baird patented a consumer *Phonovision* record player. This development was his *Phonovisor* turntable. Baird's U.S. patent 1,869,735 (British patent 324,049) depicted a Nipkow disc under the record platter. The scanning disc would have a larger diameter than the platter. For example, 20 vs. 12 inches. (The patent didn't specify measurements.) The centers of the scanning disc and record platter would mount to the same spindle. The coaxial scanning disc and record would rotate at the same speed. (A streamlined version of the patent would combine the platter and scanning disc. The platter apron would include scanning holes.)



Concept drawing: Consumer Phonovisor operation

As the record played, the disc would scan a neon glow tube inside the cabinet. The tube would flicker with the video signal from the record. Hypothetically, the viewer could view videos through a window just outside the 12-inch platter. (Or over the platter apron.) The viewing scope might have been a poor idea. Suppose that the player was on a coffee table: To see the picture, the viewer would have to kneel and squint.

The picture would appear to form on the scanning disc. McLean remarks that the picture would be tiny, only 7mm wide by 17mm high. In inches: About 0.28" wide by 0.67" high. The coaxial scanning disc would require 90 scanning holes. (Scanning three video frames-per-revolution.) (*Phonovisor mock-up*: McLean 2000, 74-75, 78, 142-144; McLean 1998, 828-829; Baird 1929).

Back-of-envelope calculations reveal the scanning aperture size. We start with McLean's picture-size estimate. See the table below. (Waltz 1931b, 71-73; McLean 2000, 135)

Phonovisor, Scanning Hole Size	
Given: Baird's screen aspect ratio= 3 units wide x 7 units high (*approximately*)	
Screen size (≤ *Neon tube cathode size; assuming "Height," below*): (17mm / 25.4)= 0.67"	
Width (mm): (7mm / 30)= 0.23mm	**Width (inches): (0.23mm / 25.4)= 0.009"**
Height (mm): (17mm / 70)= 0.24mm	**Height (inches): (0.24mm / 25.4)= 0.009"**
For even illumination of screen	
▪If square hole: Use "Width" above for width and length. ▪If round hole: Use "Width" (above). Enlarge holes 20% for slight overlap.	

Author's comment: Hard to transmit light through such small holes, even in a blacked-out room! The patent wisely provided an alternative: "Lenses, prisms, mirrors, or the like." For adequate brightness, switching from a glow tube to a crater tube would be desirable. Cutting microscopic apertures, or mounting miniature optics would require jeweler's tools. Mass production: A nightmare. Yet a few years later, William Peck's three-inch lens disc produced ten-inch pictures. The pictures had 180 lines. The illuminant was an automobile headlamp, with modulation by a light valve. (*Lenses, etc.*: Baird 1929, Col. 1; *Peck*: "Television: Disk vs. Cathode-Ray Systems" 1935; *crater tube*: Kurtz 1959, 42-43)

***Phonovisor* mock-up: Canard.** A photo depicts a mock-up of the consumer *Phonovisor*. The machine in the photo probably wouldn't work. Various disconnected or missing parts would have prevented operation.

There were more problems with the consumer *Phonovisor* mock-up. Today, we take persistent screens for granted. *VinylVideo* used one (for example, a CRT or LCD). Yet in the day of *Phonovision*, a neon glow tube was the usual screen illuminator. To display all the gray tones in an image, this tube instantly changed in brightness. No image persisted between frames, lines, or pixels. The viewer could see moving pictures only if the *entire frame* changed rapidly: About 10 fps or more. (*Phonovisor mock-up*: McLean 2000, 74-75, 78, 142-144; McLean 1998, 828-829; Baird 1929; *neon glow tube*: Kurtz 1959, 28-30, 38-39)

Visibility Problem. But the *Phonovisor* operated at only some four fps. It broke the frame-change rule. As the scan painted down the screen, some of the picture might have been visible. But likely not the whole picture. Let's put a pencil to that idea. See the calculation below. (McLean 1998, 826; Kurtz 1959, 28)

How Much of *Phonovisor* Frame Would Be Visible?
Given: Persistence of vision is about 0.1 second.
Given: Baird Phonovision operated at about 4.16 frames-per-second.
Formula: 1/4.16= seconds / frame= 0.24; 0.1/0.24= 0.416= 42%.
Summary: In 1/10 second, a *Phonovisor* user could see 42% of one frame.

Alleged portability. The *Phonovisor* mockup depicts a portable record player in a shallow case. But this case wouldn't be deep enough to hold the large tubes of the 1920s. (The tubes would have been equivalent to what RCA called "4D-base tubes." These tubes had directly-heated filaments for battery-operation. The 4D tubes were about four inches high. EXAMPLES: Type 30 or 1H4G, 4-3/16". Type 40, 3-3/4".) Such tubes would require headroom for ventilation. For amplifier power, the A-B-C (*filament-plate-grid*) batteries would be larger than the tubes. The crank-operated motor would require still more room. (*Phonovisor mockup*: McLean 2000, 78; Mclean 1998, 828; *type 4D tubes & period tube sizes, photos*: RCA 1975, 524, 580, 582, 594, 636-637; Briggs 1931, 826)

In the patent art and mockup, the *Phonovisor* looks the size of an overnight suitcase. Edison acoustic portables P-1 and P-2 (1929) might have been models for the patent art. But the Phonovisor might have to be wider and deeper than the Edison portables: McLean prescribes a 20-inch scanning disc. It would require a broader cabinet. A 16-inch disc would probably serve just as well, and keep the girth down. A disc of this size would be enough larger than the platter to work.

Reason for 16″ Scanning Disc
Given: Platter size, 12″ (*likely*)
Given: Picture height= 17mm (a bit less than 3/4″)
Find disc circumference & diameter: [(17mm x 70 holes)/π]= 379mm= 14.0″
Add safety margin of 0.5″, and round up to 16″: Enough larger than platter to work.

Result of adding 1920s electronics and a scanning disc: The Baird *Phonovisor* might approach the size of a steamer trunk. (*Patent & mockup*: McLean 1998, 828; McLean 2000, 74, 78; Baird 1929; *Edison portable phonographs*: Frow 1982, 183-184; *20" (50 cm) scanning disc*: McLean 1998, 829; *scanning disc calculations*: Waltz 1931b, 71-73)

Publicity. The impractical and undetailed nature of the *Phonovisor* patent suggests another purpose: Publicity and fundraising for the Baird interests. The publicity objective might also explain something else: Why Baird neglected a "prior art" section to differentiate his patent from Edison's work. (*Examples of period tube amplifier, battery size*: Brittin 1928, 106; Waltz 1931a; *no prior art*: Baird 1929; *Baird publicity stunts*: Abramson 1987, 105, 110; McLean 2000, 171)

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