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More on Early Electronic Television Receivers

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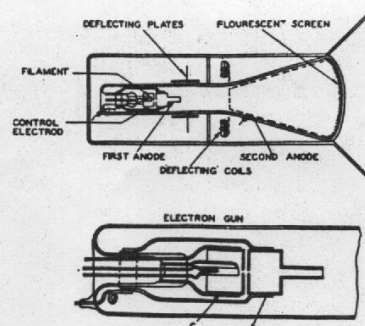
Jeff Lendaro has given Radio Age readers two entertaining and informative features on early electronic television in his articles in the April and November (1995) issues. Here is another early electronic (at least in the receiver) television developed by Vladimir Zworykin while he was at Westinghouse. Lendaro's second article prompted some research on the odd 6AL6G tube, also commented on in this piece.

Jeff Lendaro's story¹ on the genesis and rescue of the 1932 RCA field test TV set is a thorough contribution to television history, spiced by the fact that the set still exists. By one of those odd coincidences that happen, however, I've stumbled upon a description of an earlier, and probably long-lost, experimental mirror-in-the-lid set. It seems that in a 1929 issue of the obscure journal *Radio Engineering* there is a description by television pioneer Vladimir Zworykin of an experimental system for broadcasting motion pictures.²

Developed in the Westinghouse Research Laboratories, the system used a modified movie projector as its sending element. Vertical scanning of the film was achieved simply by moving it at constant speed, in tape recorder fashion. Horizontal

scanning relied on a vibrating mirror to rock a spot of light back and forth across the film, the light getting through the film then activating a photocell. (By contrast, the 1928 movie transmissions made in the Washington area by C. Francis Jenkins used a scanning disc.)

Details of the special CRT in Zworykin's TV.



¹ Lendaro, Jeff, "Early RCA Television," *Radio Age*, 20, 4, April 1995.

² Zworykin, V., "Television with Cathode-Ray Tube for Receiver," *Radio Engineering*, December 1929, pp 38-41.

The most interesting part of Zworykin's system is the all-electronic receiver, which the Lendaro article described briefly. The *Radio Engineering* article gives some interesting added details on the set. It used a seven-inch tube, similar in appearance to the heavily silvered 1932 (Lendaro) nine-inch version, except that this earlier one was unbased. The tube had electrostatic focusing and a willemite (zinc)-based green screen. The sweep system was unusual: the yoke had a set of coils for sinusoidal horizontal deflection at 480 Hz and a pair of deflection plates, external to the tube (!) for electrostatic vertical deflection at a movie-frame rate. The 480 Hz horizontal deflection frequency suggests very low resolution: only 48 lines per frame with silent movies at 20 frames per second (or 60 lines at 16 frames per second), or 40 lines with sound pictures, at 24 frames per second. Lendaro's 1932 set, it will be remembered, had 120-line resolution.

The experimental receiver was in two models: a wooden laboratory version in what we would now call a tombstone style, and a console model in a cabinet that, on inspection, seems to be a standard Radiola 47 with a mirror lid attached. The laboratory unit had ten controls, but the console was simplicity itself; only two knobs and a power switch are showing.

No details are given as to radio frequency aspects of the set, or even as to whether sound was transmitted with the pictures - the movies might have been silent. In 1928, Westinghouse was Call-book-listed as licensee of

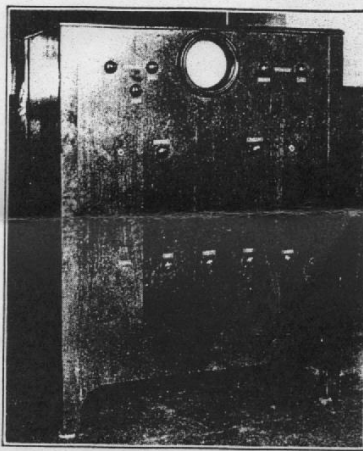
experimental stations W8XS and W8XAV in East Pittsburgh. As of 1931, W8XAV was specifically a television station, sending 20 kW on 2100-2200 kHz. At that time Westinghouse was also licensed to operate W8XT, at 25 kW on 660 kHz.

The *Radio Engineering* article was billed as a preprint of a paper upcoming in the more prestigious *Proceedings of the IRE*, but it never did appear as such. It came out at just about the same time that many Westinghouse radio research activities, and Dr. Zworykin, were being transferred to RCA's Victor plant in Camden. The RCA authorities may have wanted to withhold further publication until the future plans had settled down at RCA. Lendaro's 1932-model television receiver was indeed published in the *Proceedings*.

In Jeff Lendaro's November (1995) article on GE's TV sets at the 1939 World's Fair, he remarks on the unusual 6AL6G tube in the HM-226 receiver. This tube type came as a surprise, at least to me - the many other descendants of RCA's 6L6, like the 807 and 5881, are well known. It makes me wonder why GE didn't just use the 807 in the first place. But, "once you know to look," the 6AL6G is found listed in Raytheon's 1940, 1954, and 1957 tube-data booklets and in GE's *Essential Data...* booklets as late as 1969. The Radio Manufacturer's Association (RMA) had issued industry registration for it on August 21, 1939. Rider's *Receiving Tube Substitution Guidebook* of 1950 invites the repairman to rewire the socket to take the even more odd 6AH5G, or, not surprisingly, a plain 6L6.

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The laboratory (tombstone) version.



The console model.

