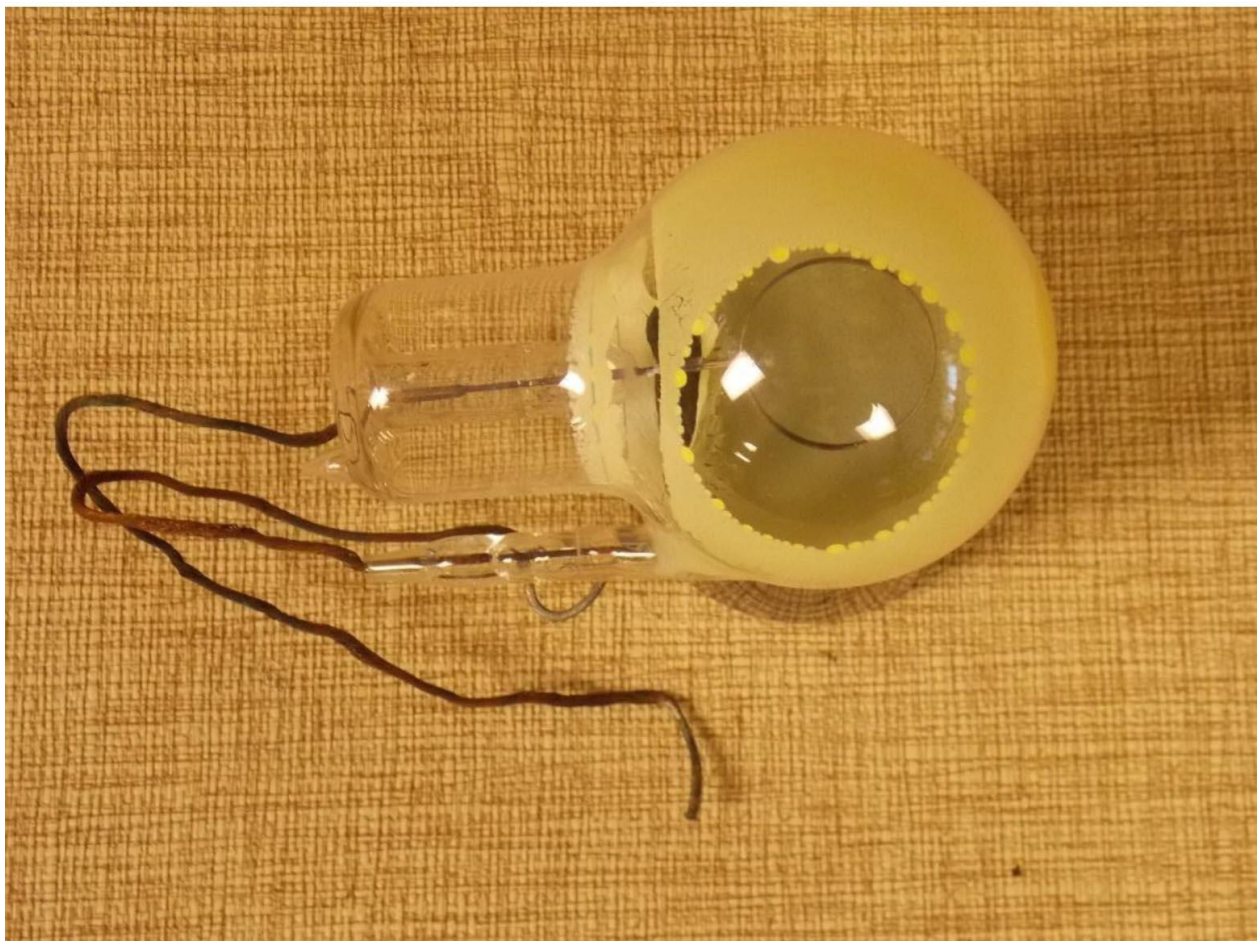


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**W7XAO (KWJJ TV) Photocell - 1929**

# Wilbur Jerman's Phototube

By Art Redman

Oregonian (published as The Sunday Oregonian.) - August 19, 1928 - page 50  
August 19, 1928 | Oregonian (published as The Sunday Oregonian.) | Portland, Oregon | Page 50

Portland radio folk will soon have television at their disposal when plans announced by Wilbur Jerman, technical director of KWJJ, mature. A short-wave television transmitter is being assembled and Mr. Jerman expects completion early next month. A consistent transmission schedule that will probably include three broadcasts a week is planned.

Announcement of Wilbur Jerman's TV station. Oregonian, Aug 19, 1928

Wilbur Jerman gave Dick Howard at a NWVRS meeting on March 8, 1975 a tube he used to transmit pictures by radio during early 1929. This, Jerman owned, television tube has no visible marking and thereby identification of this particular tube is difficult because the socket base is removed. The tube most identifiable feature is its' metal loop constructed of .005 inch thick molybdenum wire common to the Kerr or Karolus cell used in early television work. Several manufacturers of the August Karolus Cell are Telefunken, Radio Electrical Works, Cambridge Instrument Company and Eveready- Raytheon. It is doubtful Jerman used the German made Telefunken tube or system. The tube displayed by Dick Howard does not appear as a Raytheon, Cambridge, KH cell made by Radio Electrical Works, which has an Edison screw base, or any other manufacturer I can find except the V.F. Zworykin Cell. Maybe a member of the NWVRS can further identify the manufacturer and type number.

The *Oregonian* newspaper announced on February 3, 1929 that Wilbur Jerman obtained "permission to operate a television and still picture transmitter on 107 meters using his experimental station call, W7XAO". The Karolus photocell can only transmit and receive still pictures

scanned on a rotating drum or cylinder covered with photosensitive paper or radio-movies movies, which are films like regular movies. For the scanning of live subjects and models, a neon tube is required.

Mr. Jerman may have transmitted still pictures and radio movies from his residence at SE 2025 58<sup>th</sup> Avenue, Portland where he built his television transmitter. He was waiting for photoelectric cells according to the Oregon Journal of February 24, 1929.

The photoelectric cell is a glass tube or bulb containing neon or helium gas with most of the interior surface coated with a photoactive material, which emits electrons when struck by light. The two terminals of the cell are this interior coating serving as a cathode and a hoop of molybdenum wire acts as a plate, which is photo electrically neutral. A connected power source keeps the hoop positive and the coating negative. Light entering the cell makes the cell negative when electrons, which have negative charges, stream to the positive metal ring proportional to the incoming light. When placing a resistor in series with the power source and photo -cell, the voltage drop across the resistor is proportional to the light entering the cell then amplified by a three or four tube resistance-coupled amplifier. The capacitor between the grid of the first amplifier tube and phototube prevents direct current reaching the grid while passing the ac signals.

For moving pictures or live television broadcast Wilbur used the Daven Corporation Television lamp Type WT-2080 or an equivalent Eveready Raytheon Kino Lamp, universal or series motor and speed control. This television lamp is also in a C. Francis Jenkins receiver. The four different scanning discs available from Daven are 24, 36, 45, 48 lines or holes. Which one Jerman choose is unknown. The 45 hole disc by Daven had interlaced scanning. The ITT system had 60 holes requiring a disk of three foot in diameter.

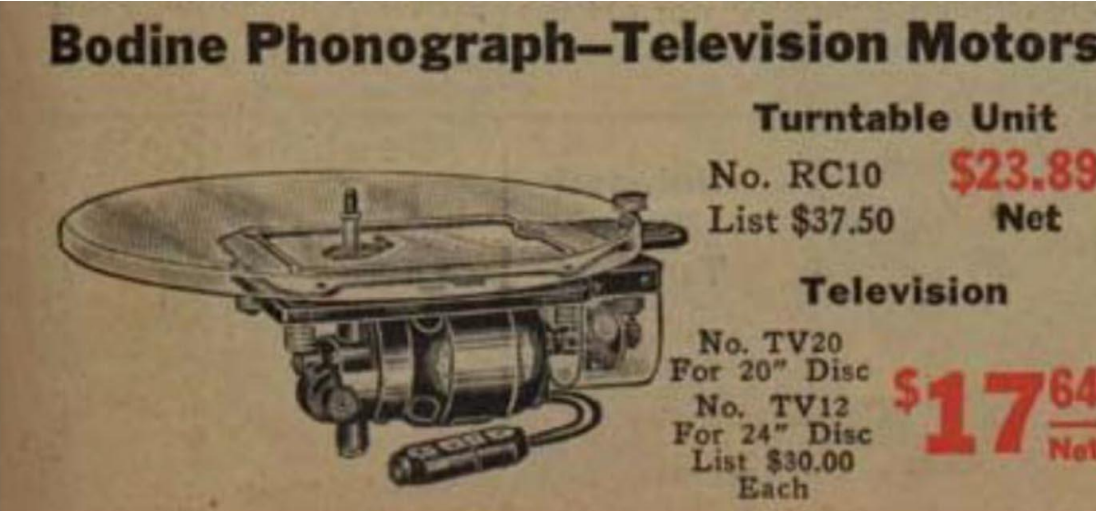
The 48 hole disc became an industrial standard. The Standardization Committee of the Radio Manufacturers unanimously adopted for recommended as a standard for scanning 15 frames per second, 48 lines per picture frame, and scanning from left to right and top to bottom in consecutive sequence on October 9, 1928.

Jerman said on February 24, 1929 "That as television is still in experimental stages it will not be advisable for those interesting to invest in receiving equipment because when the problems confronting engineers are solved and television becomes practical, receiving equipment will probably differ in many respects from that in use today". This is the last mention of W7XAO in Oregon newspapers.



There is no known public announcement of when Jerman broadcasted visual images and on his station W7XAO. Radio movies are films, which are televised and transmitted to receivers and projectors. They appear only as silhouettes or half- tones at best. Why would anyone want to leave their residence to view a half tone radio movie or silhouettes broadcast from the an upstairs room in the Broadway Theater at 622 SW Salmon Street to the Fox movie screen downstairs when the original films are so much better which is not a good business model.

The last mention of W7XAO appeared in the magazine Radio News issue of October 1929. Short Wave Craft continued listing W7XAO as a short wave station until January 1931. Jerman may have transmitted voice and music on W7XAO or rebroadcasted am station KWJJ for short wave listeners.



**Bodine Phonograph-Television Motors**

**Turntable Unit**

No. RC10 **\$23.89**  
List \$37.50 **Net**

**Television**

No. TV20  
For 20" Disc **\$17.64**  
No. TV12  
For 24" Disc **Net**  
List \$30.00  
Each

**Page from Walter Rowan Co. catalog, 1929 No. 67**

**Bibliography:**

“Awaits for Photoelectric Cells”, Oregon Journal, February 24, 1929, page 13.

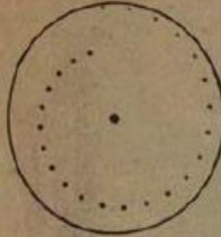
“Portland Man Will Operate Television Plant, The Oregonian, February 3, 1929, page 47.

“Portland Radio Folk”, The Oregonian, August 19, 1928, page 60.

Sterling, George E. The Radio Manual: D. Van Nostrand Company, Second Edition, 1929, pages 597 to 601, 623 and Daven Television kit pages 631 to 635.

# Daven Television Products

## SCANNING DISC



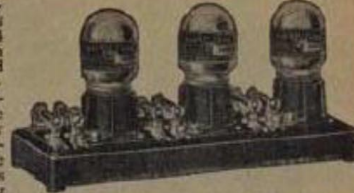
Daven Scanning Discs are designed to afford the best possible quality of image. Unless holes are laid out mathematically correct, the field will not be evenly illuminated causing light and dark lines to appear. A standard of one and one-half inch square picture has been adopted in order to take advantage of all the illumination that is obtain-

able from the Television Lamp.

T-24 24 holes.	List \$ 5.00	<del>\$3.18</del> Net
T-36 36 holes.	List 7.50	<del>\$4.77</del> Net
T-45 45 holes.	List 10.00	<del>\$6.37</del> Net
T-48 48 holes.	List 10.00	<del>\$6.37</del> Net
T-468 24, 36, 48 holes.	List 15.00	<del>\$9.55</del> Net

## TELEVISION AMPLIFIER

Daven Television Amplifiers T-3 and T-4 complete with resistors and coupling condensers. Electrically, it is the best type for Television Amplification. The Amplifier has "C" battery connections on all stages. The Amplifier should be equipped with 2 Daven HI MU-20 tubes and one or two Daven Output tubes depending upon the type of amplifier.



T-3 3 stages.	List \$12.50	<del>\$8.07</del> Net
T-4 3 stages with two output stages parallel.	List \$17.50	<del>\$11.15</del> Net

(Prices are less tubes.)

## AMPLIFIER TUBES FOR TELEVISION

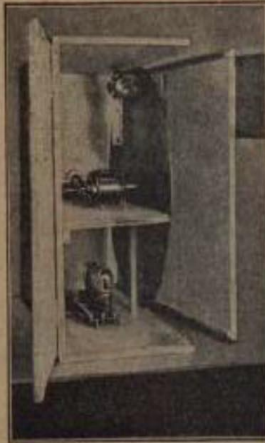
Daven tubes should not be confused with the ordinary "all purpose" tubes—they have been designed and built for special purposes and are considered by leading engineers to be the best for the purposes intended.

MU-20, the first high amplification tube to be placed on the market, is still considerably the best for all stages preceding output tube and for detector where great amplification is required.



MU-6 10 mill.	List \$2.25	Net \$1.55
AC-71 20 mill.	List \$3.50	Net \$2.42
AC-10 20 mill.	List \$3.50	Net \$2.42
	List \$0.00	Net \$6.17

## TELEVISION RECEIVER



The Daven Television Receiver has been designed to assist the dealer in the sale of Daven Television apparatus. It is a complete Television receiver and will receive pictures requiring different size disc. Apertures for 24, 36, 45, 48, line pictures are provided. The Daven Television Receiver is completely wired and includes Neon Lamp, Disc, Rheostat, Bushing, Cables, T-4 Amplifier, etc.

R-240 with 24 hole Disc.	List \$	<del>\$63.70</del> Net
R-360 with 36 hole Disc.	less	
R-450 with 45 hole Disc.	tubes	
R-480 with 48 hole Disc.	\$100.00	
R-4680 Comb. disc.	List \$105.00.	Net \$66.89

## TELEVISION TUBE

These lamps are designed to operate with an output tube in series. Will give excellent results with a current of 20 milliamperes or less. Where extremely bright illumination is required for maximum results, the tube may be loaded up to 80 milliamperes, by means of suitable output tubes singly or in parallel. Plate area 1 1/2" square.

~~\$8.58~~  
Net



LIST PRICE \$12.50

TYPE T-2080

## TELEVISION KIT



Universal Motor AC-DC. List \$27.50. Net \$17.51

In order to assist the novice in selecting the proper apparatus for constructing a simple yet efficient television receiver, the Daven Essential Kit is offered. The kit contains the following apparatus: Neon Lamp, Universal Motor, Scanning Disc, Rheostat, Three Stage Television Amplifier Motor Bushing and Complete Instructions for wiring and constructing. Tubes not included.

T-240 with 24 line disc.	
T-360 with 36 line disc.	
T-450 with 45 line disc.	
T-480 with 48 line disc.	

LIST \$60.00 ~~\$38.22~~ Net

T-4680 with Comb. disc. List \$65.00. NET \$41.40