Zenith color set, identical to one shown the FCC

Color TELEVISION

Zenith is a pioneer in the field of color television.

As far back as 1939, our laboratories started experimental work on a field sequential system that was a prototype of the first color method later adopted by the Federal Communications Commission. This Zenith system was demonstrated on an experimental basis over a closed circuit in 1941, but the project was abandoned because of manifest shortcomings.

Zenith was the first company to manufacture and sell commercial receivers with the now obsoleted CBS color disc system.

In 1949, Zenith made and sold twenty color sets using the CBS field-sequential system. These color receivers were used by a major drug manufacturer to demonstrate surgical operations over a closed circuit at medical conventions, colleges, etc.

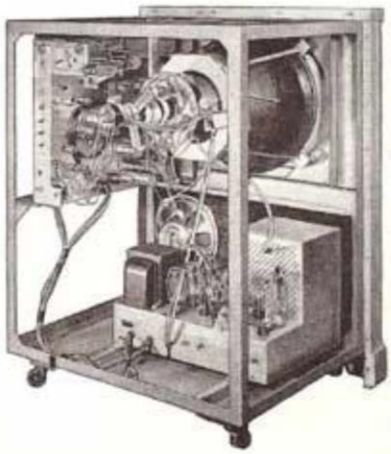
When the FCC approved the CBS color system in 1950, Zenith made a number of sets to demonstrate to its distributors. Zenith did not put these on the consumer market because your Management felt that they were not suited for general public use. Subsequent events have proved the wisdom of that decision. The abandonment of the CBS color-wheel system is now a matter of television history.

Zenith made the first commercial sale of a compatible color television set manufactured under the NTSC standards as approved by the FCC. This Zenith set was purchased by the Chicago Tribune's station, WGN-TV, in 1953. Production of similar sets will be limited, as explained in the President's message to stockholders.

One of the primary reasons for building new color sets was Zenith's belief that they would be useful to help our distributor and sales organizations keep in step with latest developments. They will also be of great value in the company's program of training service personnel. This problem is national in scope and Zenith service experts are preparing to handle it on a national basis.

Because it has been one of the pioneers in color TV, Zenith is in an especially advantageous position with regard to new developments. When a color receiver can be made with good picture size, simplified circuits, and popular prices, Zenith will be making that receiver.

For the interim, no effort is being spared in the search for a logical solution to these problems.



Stripped version of the Zenith color set showing some of the complex circuitry involved.

the RAULAND Corporation

Since the Rauland Corporation became a member of the Zenith family, its technical advances have aided Zenith in your company's time-honored role as an innovator and leader in the radionic field.

The company was first in the industry to produce such important developments as the aluminized screen, the dark faced picture tube, the reflection-proof tube face, and the 27" rectangular tube.

As with black and white television, Rauland has been a pioneer in the development of tubes for color television. When the NTSC color TV system was accepted by the FCC in December, 1953, Rauland was already well established in color tube research and development, having been one of the three manufacturers whose tubes were used in the demonstration to FCC in October, 1953.

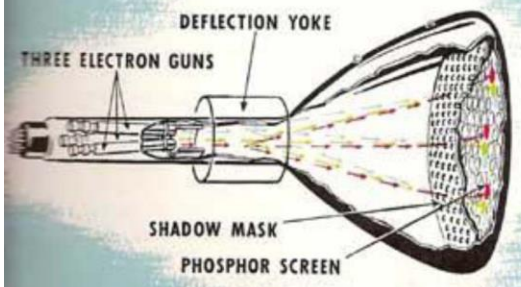
The industry's experience with color tube manufacture proves conclusively that the present three-gun color tube is exceedingly difficult to produce. Industry estimates back up that conclusion. Manufacturers' forecasts indicate that 1954 production of black and white tubes will run into millions, but color tube production will be numbered in thousands. The manufacturing problems of the tube are ones that no maker, Rauland included, has been able to solve economically up to the present.

To show why this is so, a brief explanation of the three-gun color tube will be given here. In a black and white tube, a single electron gun does the entire job of scanning the tube face and resolving the picture.

In the present three-gun color tube, one gun is used to resolve each primary color: red, green and blue. However, these beams must be screened before reaching the tube face. This is done with a device called an aperture mask, which is a plate perforated with 200,000 tiny holes, .009 inches in diameter, placed in the pathway of the beams from the electron guns.

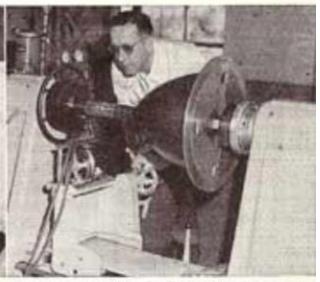
Each gun must be aligned so that each beam passes through a given hole in the mask, and strikes an individual phosphor dot deposited on the front screen of the tube. The electrons make this dot glow in a particular color, red, green or blue, depending on the chemical makeup of the particular dot. There are 600,000 color phosphor dots on the tube screen, one-third for each of the primary colors. Each dot must be exactly aligned to receive electrons from the proper electron gun *and from no other*. In the aggregate, as the three beams strike the screen they give resolution to the color picture seen by the viewer.

Rauland has established a pilot plant to study simplified methods of manufacture. Rauland engineers and scientists are working on the development of different types of color tubes. These facilities will prove invaluable in maintaining a position of leadership in color television.



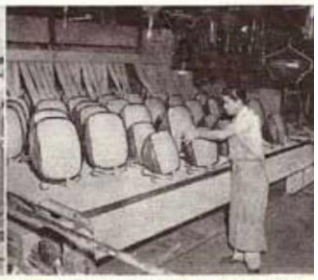
In this simplified diagram of the three-gun color tube, some of the complexities are apparent. The beams originate in the three electron generators in the tube neck at the left. The guns must be positioned and focused so that the streams of electrons will pass through the proper holes in the aperture mask and reach the screen at the front of the tube. The screen itself is made up of minute dots of materials that glow when an electron beam touches them. Individual dots will glow red, green or blue, depending on their chemical composition. To make the colors which a viewer sees on the tube face, the three electron beams must pass at the same time (although at different angles) through the same hole in the aperture mask. They must touch their various color phosphors at exactly the same instant.

Color dot and aperture alignment requires use of high-powered magnifiers.



Expert painstakingly fuses tri-color gun into neck of glass bulb or "bottle".

After perfect alignment of gun, mask and screen, tube is lowered to face plate.



Mass produced monochrome tubes emerge continuously from Lehr baking ovens.

From Zenith 1954 Annual Report

Courtesy of John Folsom