ELECTRONICS

Color Television Progress

The all-electronic system of color television in which three colors are sent and received on the TV scope at the same time has been demonstrated.

➤ THE all-electronic system of color television which the Radio Corporation of America announced several years ago as forthcoming was demonstrated to members of the Federal Communications Commission and a group of scientists and press representatives in Washington, D. C. It is a system in which three primary colors are sent and received on the TV scope at the same time.

As explained by Dr. E. W. Engstrom of RCA Laboratories, this system requires no changes in present transmission standards. Transmitting stations can change at will, either from color to black-and-white or the reverse, without requiring adjustments to either the black-and-white or the color receiver and, therefore, without loss of audience.

Existing television sets will be able to receive in black-and-white programs transmitted in color without any modification whatever and without any converter or adapter. Existing black-and-white sets, however, will not be able to receive pictures in color without a special color adapter.

In this all-electronic system, a color camera at the transmitting end produces three signals, one for each of the three primary colors of green, red and blue. These signals are sampled electronically in rapid sequence and combined. The mixture is then broadcast as a single signal.

At the receiver, the mixture is separated, so that the signal representing each color goes to an electron tube which produces pictures in that particular color. Each is fed to its particular kinescope, and then the three colors are projected simultaneously to produce the completed picture in perfect color register.

The RCA system is known as a simultaneous one because it sends the three primary color signals at the same time. The system of the Columbia Broadcasting Company is known as sequential because its colors follow one another onto the screen at high speed, so rapid that the colors affect the eye almost simultaneously. The CBS system has already been demonstrated before the Federal Communications Commission and at many places during the past year or two, including at medical meetings to permit doctors to witness by television actual surgical operations in hospitals. It is said to utilize scanning disks in a method somewhat similar to that used in colored motion picture.

At its demonstration, Dr. Peter C. Goldmark, inventor of Columbia's color television system, presented a tiny converter which will change black-and-white pictures to color. It will do this only on television receiving sets that have been adapted to receive color broadcasts in black-and-white.

The eight-ounce device contains a small motor which operates on household current. The motor whirls a tiny color disk containing the three primary colors, red, green and blue. The disk is synchronized with the color as broadcast. However, before this converter can be used, the receiving set must be adapted to color broadcasts in black-and-white.

Present TV sets can be modified to receive in black-and-white broadcasts over color TV channels at relatively low cost, David P. Smith of the Philco Corporation recently stated. But to take the modern black-and-white set and adapt it to receive color would cost between $250 and $273, he said.

Science News Letter, October 15, 1949

PHYSICS

Wrong-Way Electrons

➤ TIME runs backwards for electrons bumped too hard in atomic collisions. For these wrong-way, upside down electrons, everything is backward. They start from where they haven't been, and they speed to the place they were just an instant ago, Prof. R. P. Feynman of Cornell University reports to the scientific journal, PHYSICAL REVIEW (Sept. 15). Even their charge is backwards, being positive instead of negative.

Usually called positrons by physicists, these wrong-way electrons have long been a paradoxical problem to the theorists. Nobody wanted them when they first turned up in the mathematical description of the electron that fitted in with the theory of relativity. At first they were an embarrassment to physicists because no one had ever seen such a particle. Later when pictures of positrons were found in some cosmic ray studies, sceptics had to take the theories seriously.

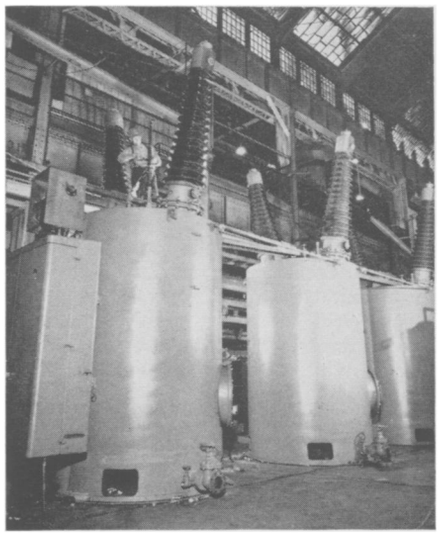
Usually when a speeding electron hits something, it is deflected in a new direction and continues on its way. However, if the electron is hit too hard, according to Prof. Feynman, the time-sense of the particle is reversed and it moves backwards in time. It is a positron.

These "turn-arounds" have often been seen in the laboratory, particularly in cosmic ray studies. Often two particle tracks come from the same spot in the picture, one particle with a negative and one with a positive charge. According to conventional description, an electron-positron pair is said to have been created at the point from which the particles emerge.

The new wrong-way electron description explains this process by saying that a positron, a wrong-way electron running backwards in time, has been bumped and turned into the right time direction, becoming a normal electron. No pair was produced, it was a turn-around.

Predestination takes a reverse twist in the new theory. It is quite possible for an electron to meet itself coming back from a place it hasn't yet been to. To point up this view, Prof. Feynman says "this view is quite different from that of the (conventional) Hamiltonian method which considers the future as developing continuously out of the past. Here we imagine the entire space-time history laid out, and that we just become aware of increasing portions of it successively." He also adds that the time order of events during a collision is irrelevant.

Science News Letter, October 15, 1949



CIRCUIT BREAKER — The 10,000,000 kilovolt-ampere circuit breaker will assure hair trigger control of the tremendous electrical energy generated at Grand Coulee Dam. When the tanks are filled with oil, the giant assembly built by Westinghouse Electric Corporation will interrupt the flow of power in one-twentieth of a second.