



Cool to the touch, these brilliant fluorescent tubes replace the hot studio lamps under which the actors formerly perspired



full COLOR

television

SO NEAR is television in natural colors that, by the time you read these lines, observers at several dozen receivers already may be picking up test programs broadcast from the Chrysler Building in New York City. Test programming is the last step before this technical wonder, long in the process of laboratory development, will be ready for the public. And officials of the Columbia Broadcasting System, the pioneer of full-color television, predict that it may become the predominant system of the future.

Not long ago, C.B.S. research men, working under Dr. Peter C. Goldmark, were well satisfied when they succeeded in transmitting a "still" photograph in natural colors by television. From that, they progressed to televising color movies (P.S.M., December, '40, p. 120). Today, action views of living subjects in colorful costumes are being put on the air.

To accomplish these "live pick-ups," Dr. Goldmark and his aids have designed a unique television camera. What it does, briefly told, is to transmit images as viewed through red, green, and blue-tinted gelatin, in incredibly swift succession. How it does it may be seen in a diagram on page 67. One of the secrets of its remarkable performance, normally hidden from view in an extension that gives the camera its queer appearance, consists of a super-sensitive pick-up or scanning tube. Side and overhead banks of cool fluorescent tubes, yielding intense light without the uncomfortable heat of conventional studio lamps, also help to solve the problem of illumination.

Home receivers for television in colors, and in black and

Action! Camera! "Live pick-ups" in natural colors being demonstrated at the C.B.S. experimental studio with recently developed equipment

white, outwardly appear just alike. Those for color, however, will contain a revolving disk tinted red, green, and blue. Conversion units of similar design may adapt many present-day sets for receiving broadcasts in natural hues.

Color wheels in home receivers will be adjusted to turn exactly in synchronism with the color drum in the studio's television camera. In other words, a red filter will cover the window of the home receiver at the same moment that the studio camera is transmitting red parts of a scene. Green images, and blue, will similarly be matched. Because the human eye retains an image for a fraction of a second, it will fuse the three colors. The result will be a full-color scene, with intermediate hues of the spectrum formed by combinations of the filter colors. All three, together, give white. In a typical home receiver being used experimentally, a 7½-by-ten-inch color image is shown in the viewing window.

Possibilities in broadcast material for color television seem limitless. Its appeal to the eye in entertainment programs is only one of its many attractions. In a "telecast" of a football game, for example, the colors of the opposing teams' uniforms will help an enthusiast to identify the players and follow the action. Fashion shows via color television are naturals. Educational programs may include tours through famous art museums, exhibiting pictures in the same tints applied by the brush of the master. A chemical reaction may be portrayed in natural color during a scientific demonstration. In fact, color television makes possible many kinds of programs in which color plays an important part, and which could not be present in black and white.

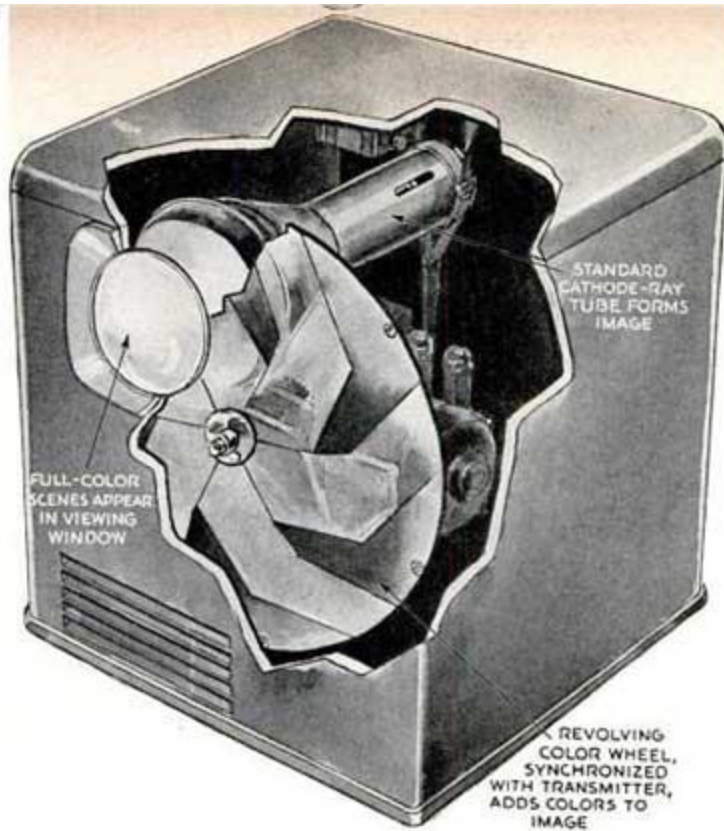
As for studio technique, "live" and motion-picture programs may be alternated, just like original and transcribed programs on the radio. Or, as in a televised drama, the two may be combined—with the studio scene fading out into a movie, and then back again. Television standards of color fidelity, incidentally, are now so high that ordinary street make-up suffices for the cast. For special lighting effects, however, a skilled operator at a "color-mixing" panel may vary the blend of red, green, and blue, enough to give a street scene, at will, the tints of dawn, noon, and sunset.



A typical home receiver for television in color. The drawing at the right shows how a whirling disk combines red, green, and blue tints in a single image

And this is the unique camera designed by Dr. Goldmark and his aids. A key feature is a supersensitive pick-up or scanning tube that makes the new marvel possible

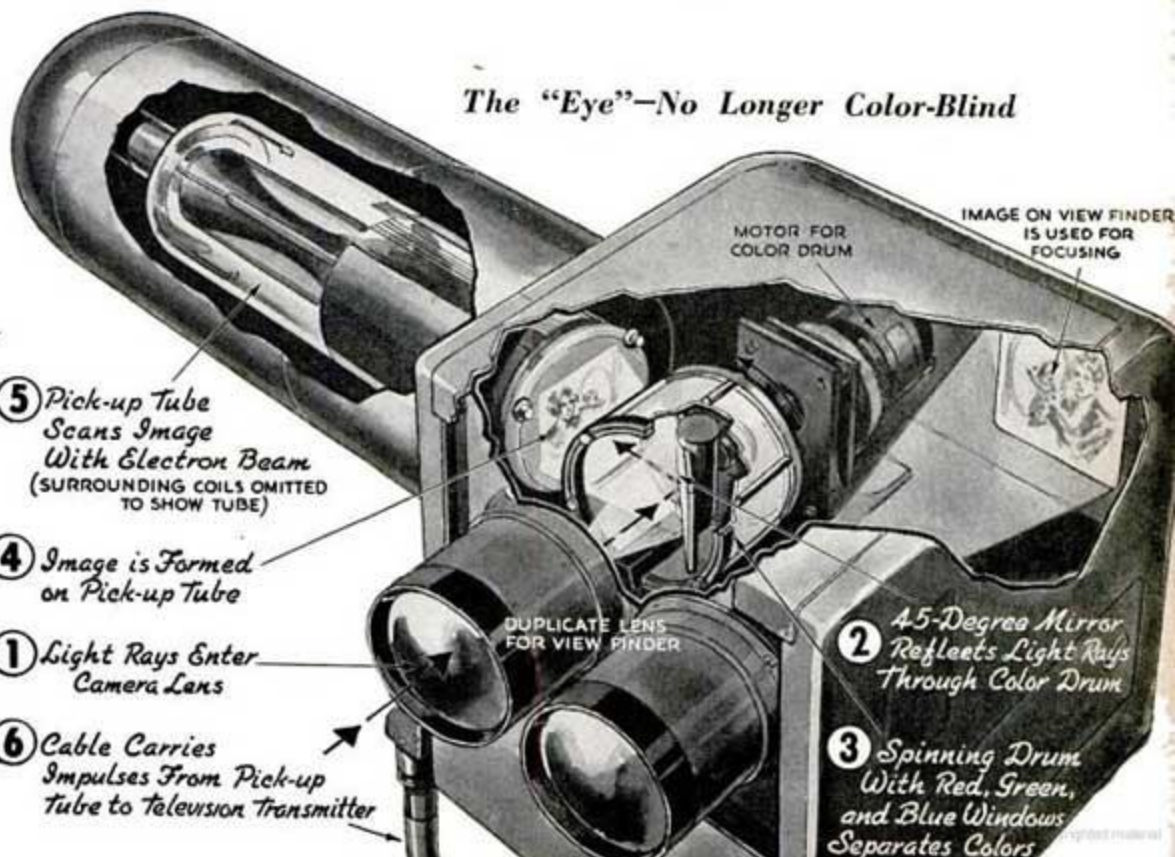




Home Receiver for Color Television

HOW COLORS ARE PUT ON THE AIR

In the color-television camera, images to be broadcast are scanned through panels of red, green, and blue gelatin in a rapidly rotating drum. The home receiver contains a revolving disk made up of transparent sections of the same colors, through which the image on the screen is viewed. This is synchronized with the drum in the camera, so that each portion of the image is viewed through a filter of the same color as that through which it was scanned, and the eye blends all into a picture in natural color.



The "Eye"—No Longer Color-Blind