RADIO & TELEVISION NEWS

A RIFF DAVIS PUBLICATION

AUGUST
1952

35¢
In Canada 40¢

ANC

IN THIS ISSUE

COVER PHOTO: Robert Mitchum, star of the Wald-Krasna production "The Lusty Men," on location. RCA's portable magnetic recorder-reproducer equipment was used in this filming. (Ektachrome by J. Dale Healy and Alex Kahle)

First in radio-television-electronics

Average Paid Circulation over 200,000

RADIO & TELEVISION NEWS

Reg. U.S. Pat. Off.

Radio News Trademark Reg. U. S. Pat Office • Television News Trademark Reg. U.S. Pat. Office.

CONTENTS AUGUST, 1952

DEPARTMENTS

ZIFF-DAVIS PUBLISHING COMPANY

VOLUME 48 • NUMBER 2

ABC Member Audit Bureau of Circulations

Editorial and Executive Offices, 366 Madison Ave., New York 17, N. Y.

SUBSCRIPTION SERVICE: All communications concerning subscriptions should be addressed to Circulation Dept., 64 E. Lake St., Chicago 1, Ill. Subscribers should allow at least two weeks for change of address.

CONTRIBUTIONS: Contributors are advised to retain a copy of their manuscripts and illustrations. Contributions should be mailed to the New York Editorial Office and must be accompanied by return postage. Contributions will be handled with reasonable care, but this magazine assumes no responsibility for their safety. Any copy accepted is subject to whatever adaptations and revisions are necessary to meet the requirements of this publication. Payment covers all author's, contributor's, and contestant's rights, title, and interest in and to the material accepted and will be made at our current rates upon acceptance. All photos and drawings will be considered as part of the material purchased.

WHAT IS EIDOPHOR?

Details on CBS's color system for theater TV viewing, as recently unveiled in New York City.

THE EIDOPHOR projector, a development of a group of Swiss scientists at the Federal Institute of Technology and Dr. Edgar Gretener A.G. of Zurich, is similar to a motion picture projector. The arc lamps are practically identical and projection lenses are used to magnify the desired images on the theater screen.

Through the joint efforts of this Swiss group, *CBS*, and the technical staff of *Twentieth Century-Fox Film Corporation*, the original black-and-white equipment has been converted in order to provide color transmissions for theater projection.

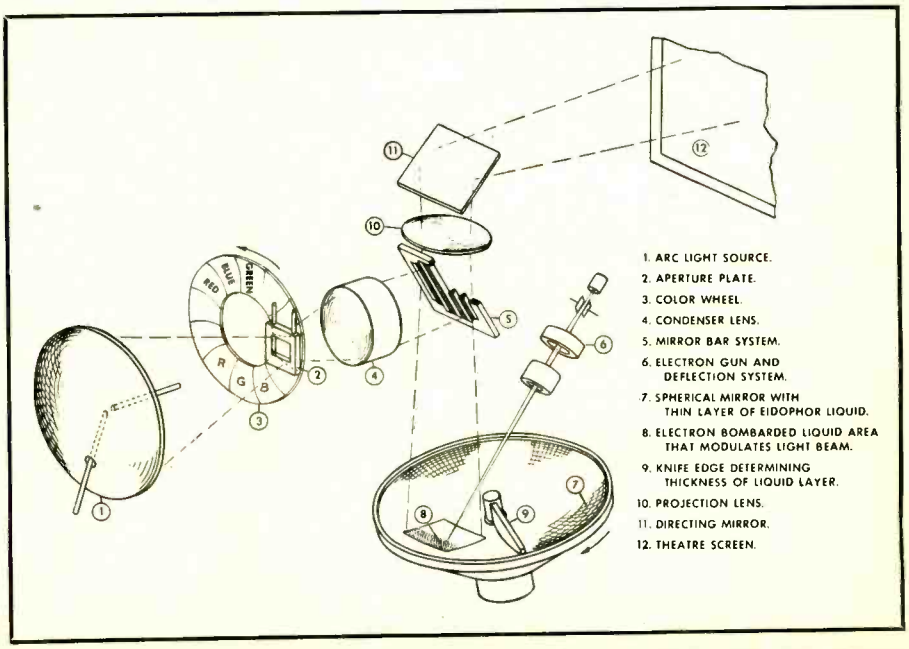
In the case of the motion picture projector, a band of film carrying a series of images is passed intermittently through the light beam, a shutter being provided to cut off the light while the film is traveling. In the *Eidophor* projector, instead of photographic images on a strip of film, a sequence of images is created on a thin layer of a special liquid (about the consistency of honey) which is placed on a slowly rotating mirror surface in a position optically equivalent to the position of the film in an ordinary projector. The succession of images on the thin liquid layer is produced by means of electrons deposited on the surface of the liquid. These electrical charges are proportional to, and controlled by, the television signal, in much the same manner that a television signal is used to produce an image on a regular TV picture tube.

The essential difference is, of course, that in the home receiver tube the electron beam strikes the end of the tube and causes the phosphor material to glow point-by-point and line-by-line, with a brightness which is proportional to the point-to-point brightness of the original scene.

In the *Eidophor* projector, however, the electron gun causes the liquid to take on tiny surface irregularities and thus to change its optical properties. The picture thus produced appears very much like the relief image in hardened gelatin used in some photographic processes, after the silver image has been bleached away. By means of auxiliary lenses and properly arranged mirrors the instantaneous picture on this "image bearing" layer of liquid is projected to the screen.

The *Eidophor* image is in a position "optically equivalent" to the position of the film in a standard projector. This point should be explained further. In the motion picture projector the center line or the light beam passes through the center of the picture being projected and along the same line through the center of the lens to the center of the screen. In the *Eidophor* system, however, the light from the arc passes through auxiliary lenses to a plane mirror arranged in parallel bars—and set at about 45 degrees to the light beam direction—which reflect half the light downward. (Half of the light because the width of the mirror bars and the spaces between them are substantially equal). Thus half the light is lost, just as it is lost by the shutter blades in the standard motion picture projector. The light

Mechanical layout of the Swiss-inspired "Eidophor" theater projection system.



that travels downward strikes the *Eidophor* liquid film and the reflecting mirror surface on which the film is carried.

This mirror reflects the light straight back along the same path *providing there is no picture* (or distortion) on the liquid surface. When there is no such picture, the reflected light strikes the tilted mirror bars and is again reflected back to the lamp house, not to the screen. Hence there is no light on the screen when there is no picture on the liquid. However, when a picture is formed on the liquid, as previously described, the optical properties of the liquid layer are changed and the light reflected by the *Eidophor* mirror is deflected, enabling it to pass through the slots between the tilted bars. The picture forming light passes through the objective lens and then strikes a final mirror which directs it to the projection screen.

Since the amount of the deflection of the light from each point-to-point area of the *Eidophor* picture depends on the amount of deformation of the liquid at that picture point and since each picture point is "scanned" by the electron beam many times a second, a complete picture reaches the screen. The pictures seem to have action just as do motion pictures or home TV pictures because the component images follow each other in such rapid succession that the human eye cannot see the pictures separately.

What about color with this new projection system? Motion pictures can be made in color if three separate films are used—one colored in a manner to produce a red light yielding a stimulus equivalent to the red stimulus received by the eye when it views the scene; one colored green in a similar way; and one similarly colored blue. If these three partial color pictures are projected together a complete picture in natural color will result.

These three separate color records may be projected at the same instant but they could be equally well projected one after the other at a sufficiently rapid rate so that the eye does not see the colored images as separate and distinct single color pictures.

This latter system is roughly the field sequential system of *CBS'* home color television. Approximately this same basic technique is being used for color projections with the *Eidophor* system. A small wheel, composed of red, green, and blue segments, is inserted in the beam of light at the arc lamp of the projector and is rotated so that the red, green, and blue segments are placed in position in the beam at the instant that the television signal contains picture information of the corresponding color.

This new system, the one which *Twentieth Century-Fox Film Corporation* proposes to offer to the motion picture theater owner, was recently demonstrated to the press in New York City. See this month's "For The Record," page 8.

—30—

RADIO & TELEVISION NEWS

RGB Wheel

Dichroic Wheel. Note the differences in the colors when light is transmitted through (left) and reflected off (right side of right picture)

Color wheels from a Swiss GRETAG Eidophor projector. Note

Courtesy of Jerome Halphen