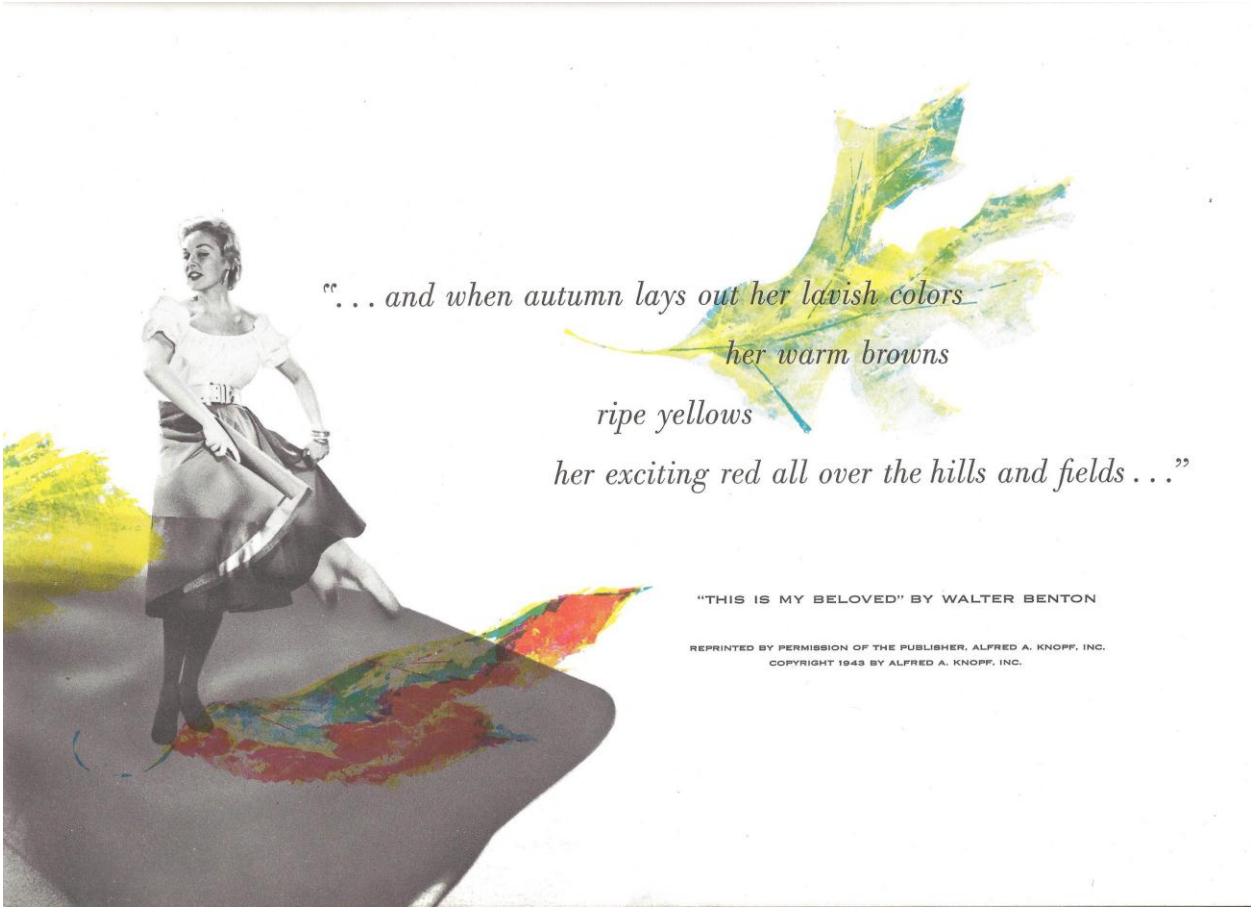
GENERAL ELECTRIC

# STEPS TO COLOR

COMPLETE COLOR EQUIPMENT FOR TELEVISION BROADCASTERS

GENERAL ELECTRIC



*". . . and when autumn lays out her lavish colors*

*her warm browns*

*ripe yellows*

*her exciting red all over the hills and fields . . ."*

"THIS IS MY BELOVED" BY WALTER BENTON

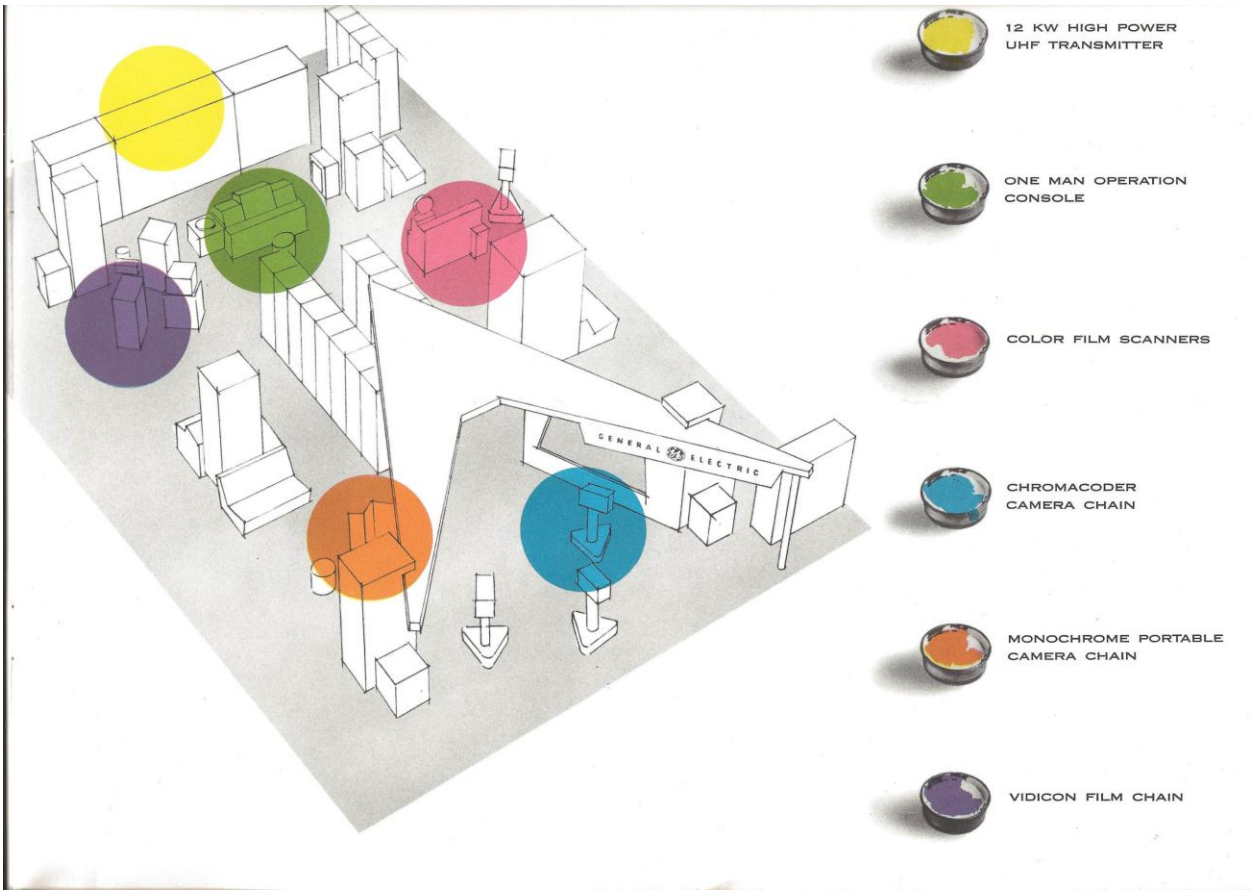
# *the whole world*

# *is a festival of color...*

The whole world is a festival of color. And some day, in your community, through your television station, you will present it to your viewers. You will show them the mountains around Salt Lake City with the rich shadows changing colors slowly and beautifully in the sunset; the sunrise services at Easter; the riot of hues and shades in the Grand Canyon; the cherry blossoms with the needle that is the Washington monument rising out of them; the bougainvillaea and orchid gardens of Hawaii; the flamingos at Hialeah.

You will bring them man-made color, too. You will show the husband the fabrics and colors in fashion shows, and he will see then, for the first time, what she has tried for so long to describe in words. You will show women new colors for interior decorating, new table arrangements, new ways of preparing foods that look as wonderful as they taste. You will bring whole art museums — Rembrandt, el Greco, Van Gogh — into your town's homes. You will present musical shows with their rainbows of lovely ladies, handsome men, and gorgeous costumes.

Each day you will present a new festival of color . . . a feast for the eyes, to enrich all who see it.


GENERAL ELECTRIC
12 KW HIGH POWER
UHF TRANSMITTER
ONE MAN OPERATION
CONSOLE
COLOR FILM SCANNERS
CHROMACODER
CAMERA CHAIN
MONOCHROME PORTABLE
CAMERA CHAIN
VIDICON FILM CHAIN

# *before the artist paints*

# *someone grinds colors*

In January, 1954, the Columbia Broadcasting System agreed that the General Electric Company should manufacture and market its color broadcast equipment. G.E.'s Electronics Laboratory immediately began adapting CBS experimental models for commercial production.

This was only one more step by General Electric to bring color television to reality. G.E.'s research and development in this field date back to the days when Dr. E. F. W. Alexanderson was demonstrating his scanning disc television. Scientists at its General Engineering and Research Laboratories sought answers to the mysteries of color television. The Electronics Laboratory at Electronics Park, Syracuse, N. Y., accumulated so much information and equipment on color that a full-scale laboratory came into being.

In 1950, Dr. W. R. G. Baker, G-E Vice President and General Manager of its Electronics Division, submitted General Electric's color television system to the FCC. The system never materialized, but one of its basic concepts was compatibility. Another element, frequency interlace, became an important part of the final NTSC system.

In 1952, G.E.'s experimental station at Electronics Park went on the air with color signals generated from slides and live pickups with G-E equipment, and has been transmitting intermittently since then.

When the National Television System Committee of the RETMA was formed to set up color standards, Dr. Baker was named chairman, and held this position until the committee was dissolved early in 1954. Made up of 315 individuals from nearly 100 companies and organizations in the electronics industry, this committee collected, evaluated, assembled and presented the material as a set of standards to the FCC in July, 1953. The following December, the FCC formally adopted the NTSC standards for color television.

## *three steps to color*

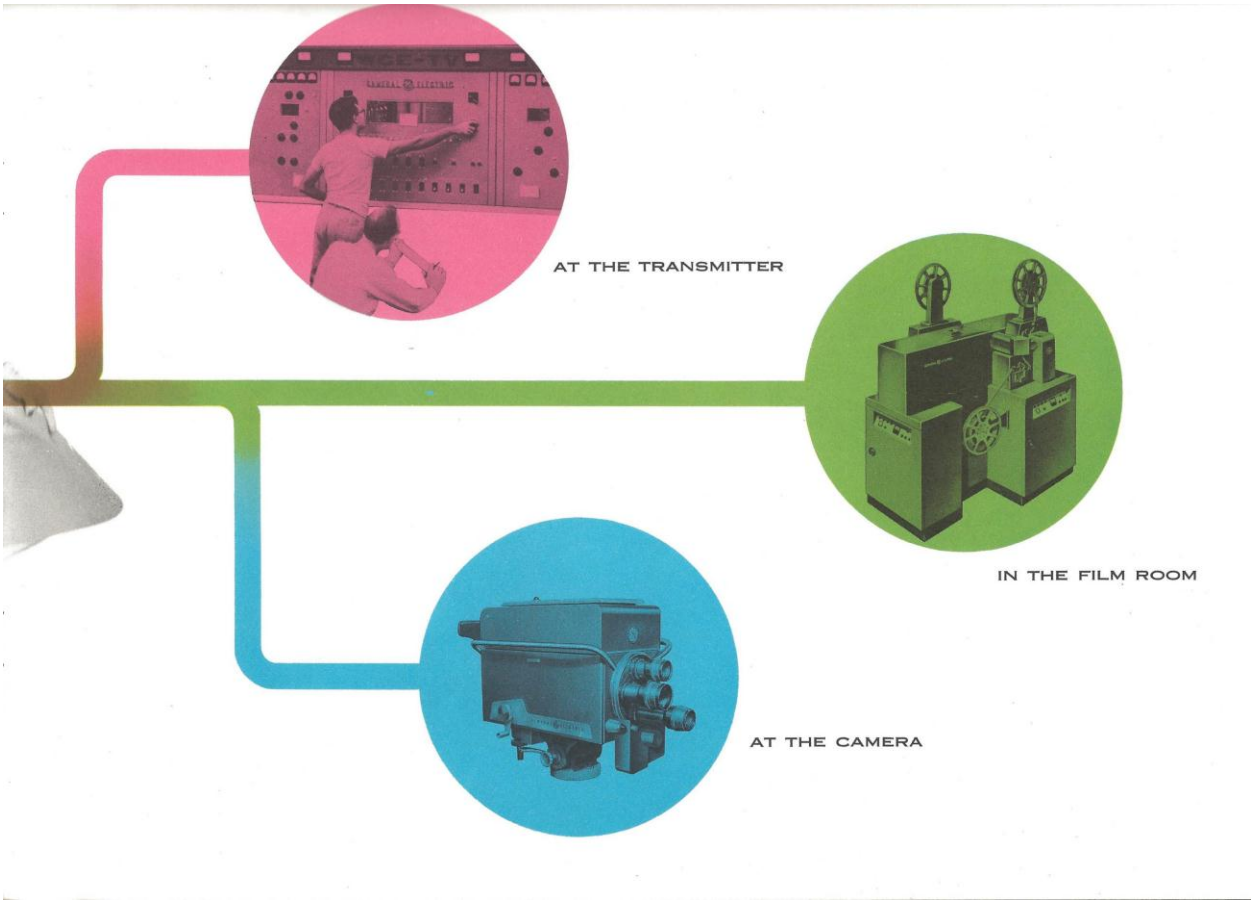
Most existing television stations will convert to color broadcasting by the adoption of three general phases. It is expected that the stations will adopt them, one at a time, in the following order:

1. NETWORK. Convert black and white transmitters that are now in operation so that they will satisfactorily broadcast color shows originated by the networks.

2. FILM. The station originates color programs from motion pictures and slides. It is here that a station first can serve its local advertisers. This step requires projection equipment especially designed for color film.

3. LIVE. The station broadcasts, in color, its own studio shows or remote pickups of special events in the area.

General Electric has solved the problems presented by each of the individual phases outlined here. It frankly recognized the complexities of color and turned to some of the country's leading authorities for expert help toward their solution.


AT THE TRANSMITTER
IN THE FILM ROOM
AT THE CAMERA

# *color at the transmitter*

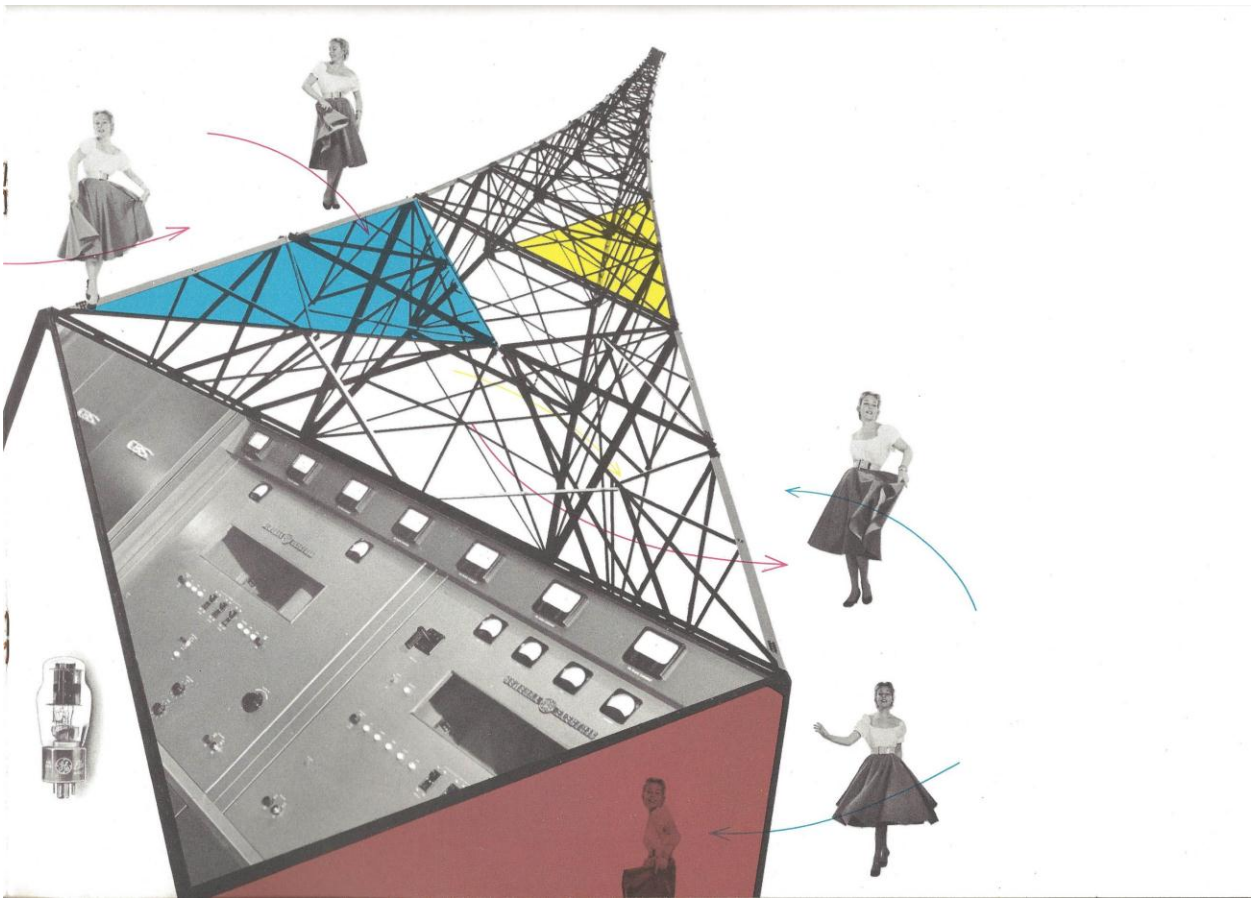
The easiest way for a television broadcaster to put color into the sets of his viewers is for him to carry network color shows. He can do this by converting his black and white transmitter so that it can put out a color signal that conforms to the FCC specifications.

A transmitter built for black and white must be modified internally. General Electric transmitters can be changed within two or three hours by the addition of a few parts. These parts, and the engineering supervision for their installation, are supplied without charge to all stations with G-E transmitters. All General Electric transmitters shipped since June, 1954, have had these modifications built into them at the factory.

External components are also required for the best color transmission. These consist of a linearity corrective amplifier, a receiver corrective filter, and a lower sideband subcarrier trap. All transmitters, regardless of manufacture, require some means of removing this subcarrier. Color monitors and certain pieces of test equipment are also essential.

General Electric's black and white transmitters have proved exceptionally easy to convert to color. WCBS-TV, New York, began broadcasting color programs in September, 1953, under a special FCC license. The G-E 5 KW transmitter there was modified without loss of air time.

This smoothness of conversion and ready acceptance of color by G-E transmitters is no accident. As new color developments came out of the laboratory, G-E design engineers incorporated them into black and white transmitters. The result was an over-designed black and white transmitter; one which could be converted to color quickly and easily as soon as possible after the FCC gave the green light.



# *color in the film room*

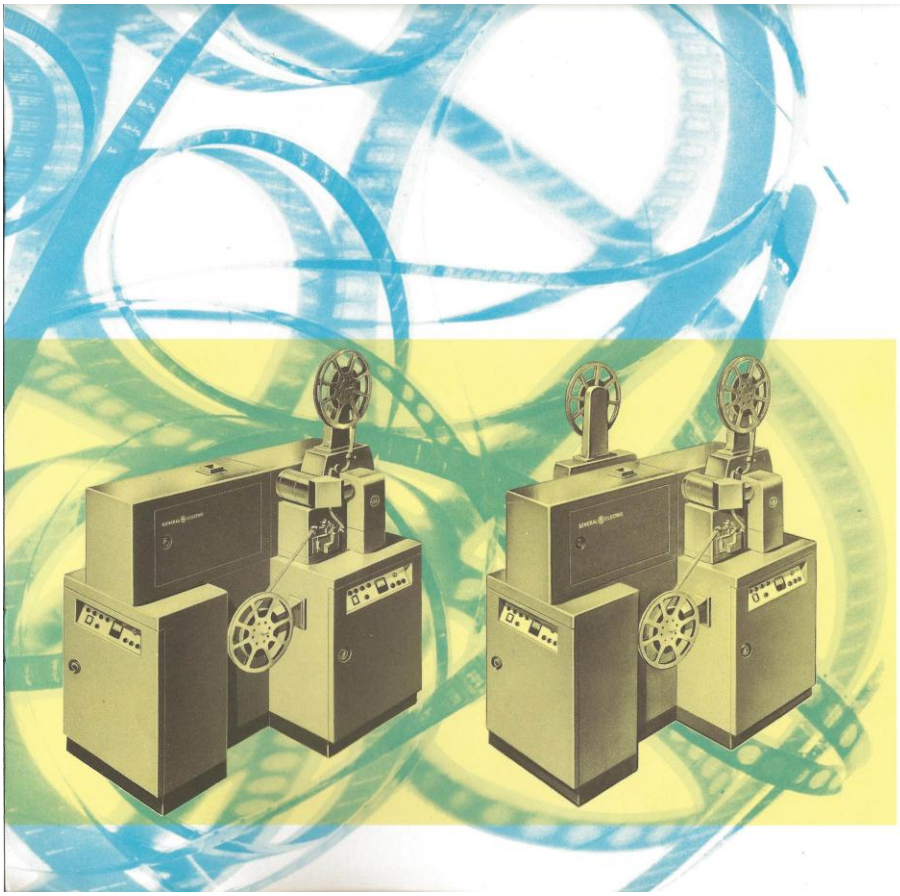
Advertisers appreciate the value of color in merchandising. Their packaging, whether of soaps or automobiles, testifies to this. With widespread color television will come new advertisers whose products *demand* color in their advertising — paints, floor coverings, fabrics. National and local advertisers will want slide and motion picture spots.

General Electric's film room equipment for color is a complete new line. There is a 2x2 Scanner for slides; a Continuous Motion Scanner for 16mm motion picture film; and a Scanner Channel that replaces the film camera used with black and white film.

G.E. has a *practical* continuous motion scanner. Eastman Kodak developed the optical system for it, solving problems that have plagued continuous motion projectors for three decades. Its secret lies in the use of a highly efficient mirror system that can take advantage of a fast lens system. Thus, a satisfactory noise-free color picture is delivered even from films with wide variation in density. The light source is a flying spot scanner, which lends itself especially well for this adaptation.

This equipment is designed so that you have a choice when you purchase. You can time your expenditure, buying the Slide Scanner by itself; or the 16mm Motion Picture Scanner by itself; or a combination of both. And when you combine them in your film room, the result is an integrated piece of equipment with a pleasing appearance.

Operationally, the equipment has no difficult color registration problems to complicate adjustment. Both the Continuous Motion Scanner and the Slide Scanner use a flying spot scanner for light sources. Each has its own source so that failure of either does not put the entire system out of operation. Like the transmitters, the equipment is compatible, handling monochrome film, too.



# *color at the camera*

The live camera is the final step for any station preparing to broadcast color. And while there is a multitude of difference in the detailed operation, live programming for color is like that for black and white in one respect — the cameras are used either in the studio or for remote pickups.

General Electric's color camera will do the job for you in either place. Physically, it differs little from the familiar black and white camera. The only major change is in the addition of a color disc.

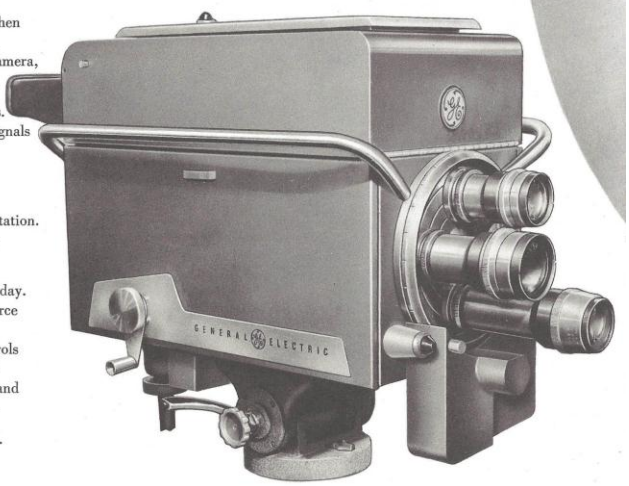
This camera and its related equipment make up the Chromacoder camera chain. When the camera is in operation, the disc spins, putting first a red filter, then a blue filter, then a green filter in front of the single image orthicon tube. The signals from the camera, likewise, are first red, then blue, then green. That is, it is a field sequential camera.

But FCC standards require the simultaneous presence of red, blue and green signals. Therefore a part of the camera chain is the Chromacoder, which takes the color signals that come in sequence from the camera, and converts them to simultaneous signals that conform to FCC standards.

This Chromacoder is rack mounted equipment, centrally located in the station. One Chromacoder may be used to convert the output of all cameras in use by the station. Registration adjustments, gamma controls, and the operation of the NTSC encoder are performed only once at its control panel.

The Chromacoder camera channel has advantages found in no other color system today. The camera is economical and maneuverable. These two basic qualities are the source of a long list of advantages for the station. There is only one conventional image orthicon tube in each camera — hence, low tube replacement costs. The video controls at the camera are the same as those of a black and white camera, with the addition of color balance controls. There is only one video cable from the camera. It's light and compact — easily handled in the studio or on remotes.

Initial cost? You'll be pleasantly surprised when you talk to the man with the facts.



AT ELECTRONICS PARK

# *the men with the facts*

These are the men with details at

their fingertips. If they

don't know the answers, they'll

find other men who do. Ask them.

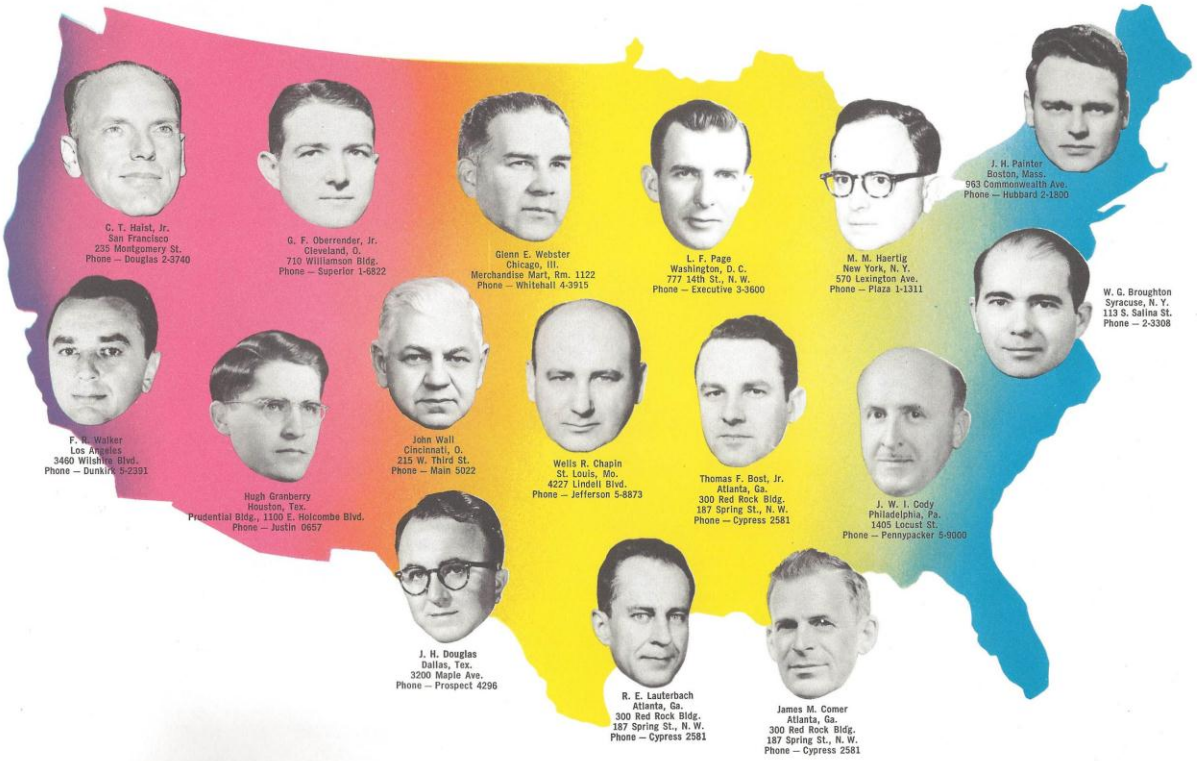
P. L. Chamberlain
General Manager

F. P. Barnes
Manager — Marketing

C. G. Lloyd
Manager — Engineering

G. R. Lord
Manager — Manufacturing

## THROUGHOUT THE USA



C. T. Haist, Jr.
San Francisco
235 Montgomery St.
Phone — Douglas 2-3740

G. F. Oberrender, Jr.
Cleveland, O.
710 Williamson Bldg.
Phone — Superior 1-6822

Glenn E. Webster
Chicago, Ill.
Merchandise Mart, Rm. 1122
Phone — Whitehall 4-3915

L. F. Page
Washington, D. C.
777 14th St., N. W.
Phone — Executive 3-3600

M. M. Haertig
New York, N. Y.
570 Lexington Ave.
Phone — Plaza 1-1311

J. H. Painter
Boston, Mass.
963 Commonwealth Ave.
Phone — Hubbard 2-1800

W. G. Broughton
Syracuse, N. Y.
113 S. Salina St.
Phone — 2-3308

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3460 Wilshire Blvd.
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Prudential Bldg., 1100 E. Holcombe Blvd.
Phone — Justin 0657

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Wells R. Chapin
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Thomas F. Bost, Jr.
Atlanta, Ga.
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187 Spring St., N. W.
Phone — Cypress 2581

J. W. I. Cody
Philadelphia, Pa.
1405 Locust St.
Phone — Pennypacker 5-9000

J. H. Douglas
Dallas, Tex.
3200 Maple Ave.
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187 Spring St., N. W.
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James M. Comer
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187 Spring St., N. W.
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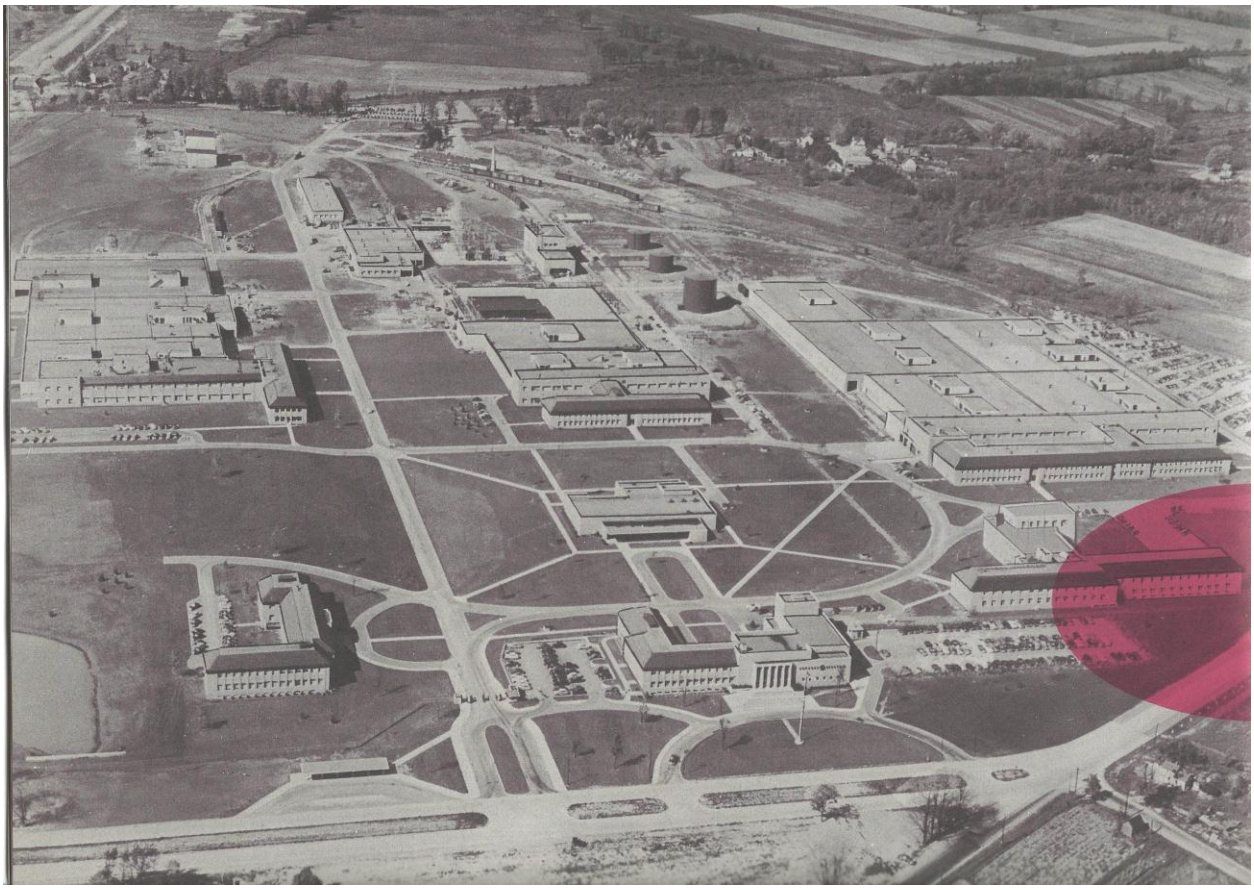
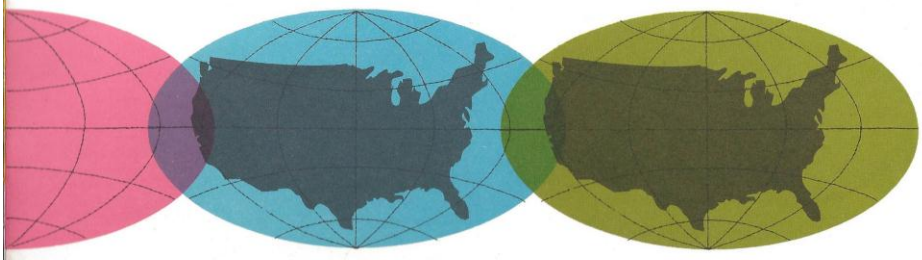


Electronics Park, near Syracuse, N. Y.

Where General Electric makes

Complete Monochrome and Color Equipment for UHF and VHF



PROGRESS IS OUR MOST IMPORTANT PRODUCT

GENERAL ELECTRIC