TELEVISION AT WRGB

GENERAL ELECTRIC

Stripping away the blinders of distance and darkness, building a bridge across space, television is bringing the world right into your living room . . .

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WRGB

On the south bank of the Mohawk River in Schenectady, New York, stands television station WRGB.

This testimonial to General Electric's faith in the future of television is the most powerful and one of the best-equipped stations in the United States.

On the air since 1939, WRGB has been used primarily as a laboratory for experiments in programming, staging, lighting, and engineering problems. For not only is television a new science—it is a new art as individual as that of the radio, the theater, and the motion picture.

The very fact that television has elements of all three requires the utmost ingenuity in planning studio productions. The staff at WRGB originates programs three evenings a week. In addition, the station relays several hours of programs each week from the NBC studio in New York City.

TONIGHT AT 8:00

WRGB *goes on the air.*

In the noontime brightness of the studio, lighted by an overhead battery of water-cooled mercury-vapor lamps, the producers and technicians go through the preparations for the evening's show.

As on a Hollywood sound stage, they have arranged sets to accommodate the scenes called for by the script. As for a stage play, they have chosen the costumes, coached the actors in their parts. As for radio, they have adjusted the microphones, cued the timing so as to eliminate "dead spots" on the air, checked the sound-effects equipment.

At one end of the studio a staff member at a "light organ," by means of keys, circles or tilts the large overhead lamps. A technician adjusts the floor spotlights. Other staff members are maneuvering the television cameras, which are mounted on truck-like dollies.

At last, from the control room, a voice booms:

"*Five minutes, five minutes till airtime. Everybody in the studio and the doors closed. Five minutes . . .*"

The actors take their places; the announcer poises, waiting for the final signal.

"*One minute, one minute till airtime!*"

On the front of the cameras the glass buttons glow ember-red, signaling the players that they are on the air. Then the announcer begins:

"Good evening, ladies and gentlemen. This is WRGB, General Electric's television station, in Schenectady . . ."

Shortly before airtime at WRGB: the audience trickles in; its chairs quarter-circle the studio. It sees the performance from one angle; the home audience sees it from many.

SHOW

"FOCUS all, keep 'em coming in. Come in some more, two—*hold the dolly!*"

Tonight's show is a costume operetta unearthed and dusted off by the WRGB staff. A love intrigue, on a lesser scale than that of "Romeo and Juliet," the operetta allows unusual staging and directing, adding to the variety of the weekly television schedule.

From the control room at the end of the studio, behind a large observation window, the show producer and the engineers have a crow's-nest view of the studio floor.

Through earphones clamped to the camera men's ears, the producer gives his directions, telling the men where to move to get the best shots. One camera is directed to take a new position for a sudden change of action, while the other cameras continue to pick up the action on the old location.

Since the studio's three cameras are in constant use, there are always three sets of images on the monitor-screens of the

control panel. The producer selects the one to be telecast.

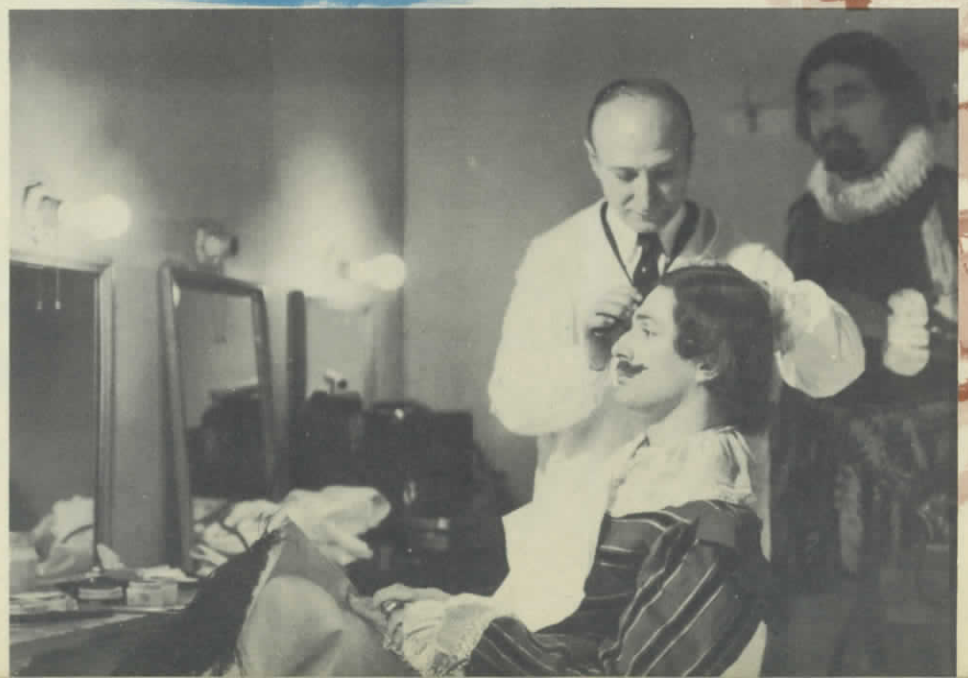
"Fine shot, there, if you can get a foot to the left," says the producer to one of the camera men, via a microphone and head phones. Then to the technical director beside him: "Ready to take three—take three!" A button is pushed, and the scene relayed by the number three camera flashes on the air.

In the same way music and sound effects are faded in and out, presenting a rounded and complete performance to the television audience.

The television audience knows it is watching something that's happening that very instant.

Costume and period plays and light operas are television favorites.

BACKSTAGE



Backstage preparations progress through auditioning, casting, scene designing, rehearsal and make-up. Lights are controlled from a balcony at the back of the studio . . . motion pictures are projected into television cameras in a special projection room . . . from the glassed-in control room the program producer and engineers give directions to camera men and monitor the picture and sound.

TRANSMITTING AND RELAYING

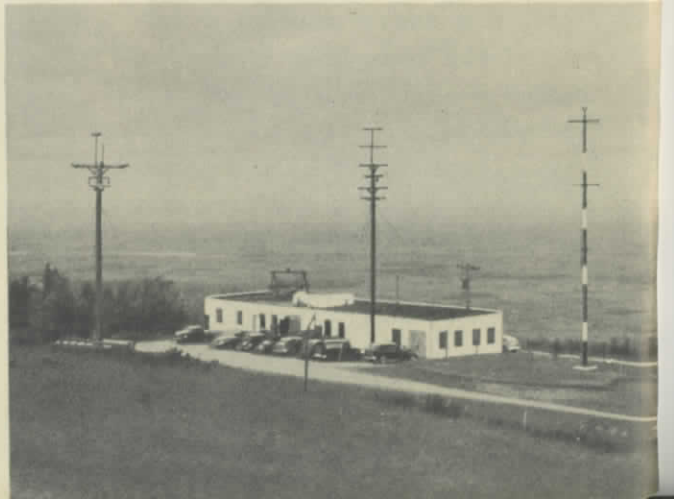
WITHIN each television camera is a tube like a glass miniature of the Big Dipper. The images of the players focus on a photo-sensitive plate at the "dipper's" back. There they are converted into a series of electrical impulses.

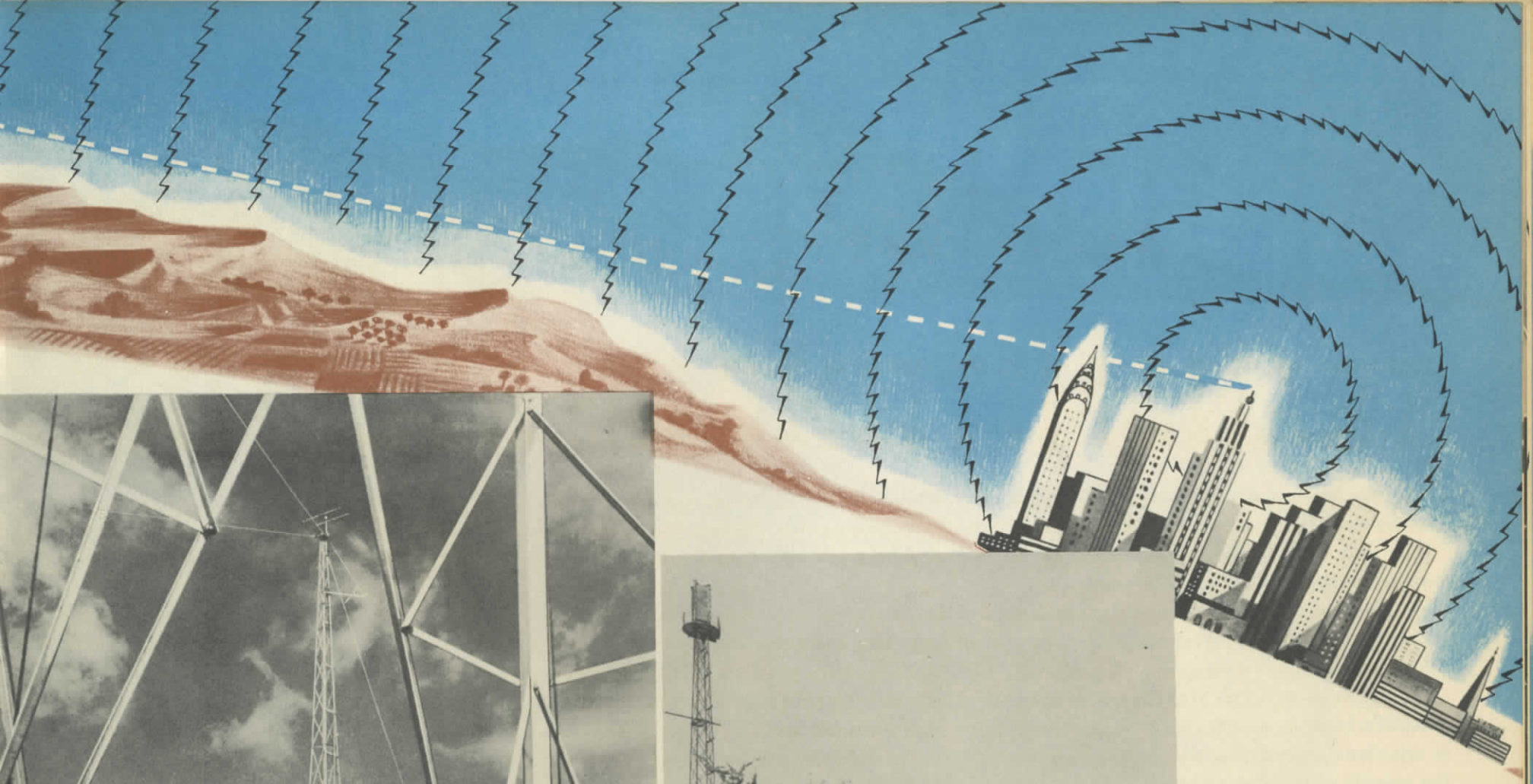
These impulses travel to the control room through a thick cable snaking across the floor. There the engineers monitor the impulses which make up the picture and the sound, and both are carried instantly by very short radio waves to the main television transmitting station, 12 miles away and high in the Helderberg Mountains. There they are broadcast, and home receivers pick up the waves with a cathode-ray picture tube, which looks like a bulging glass funnel, closed at the large end.

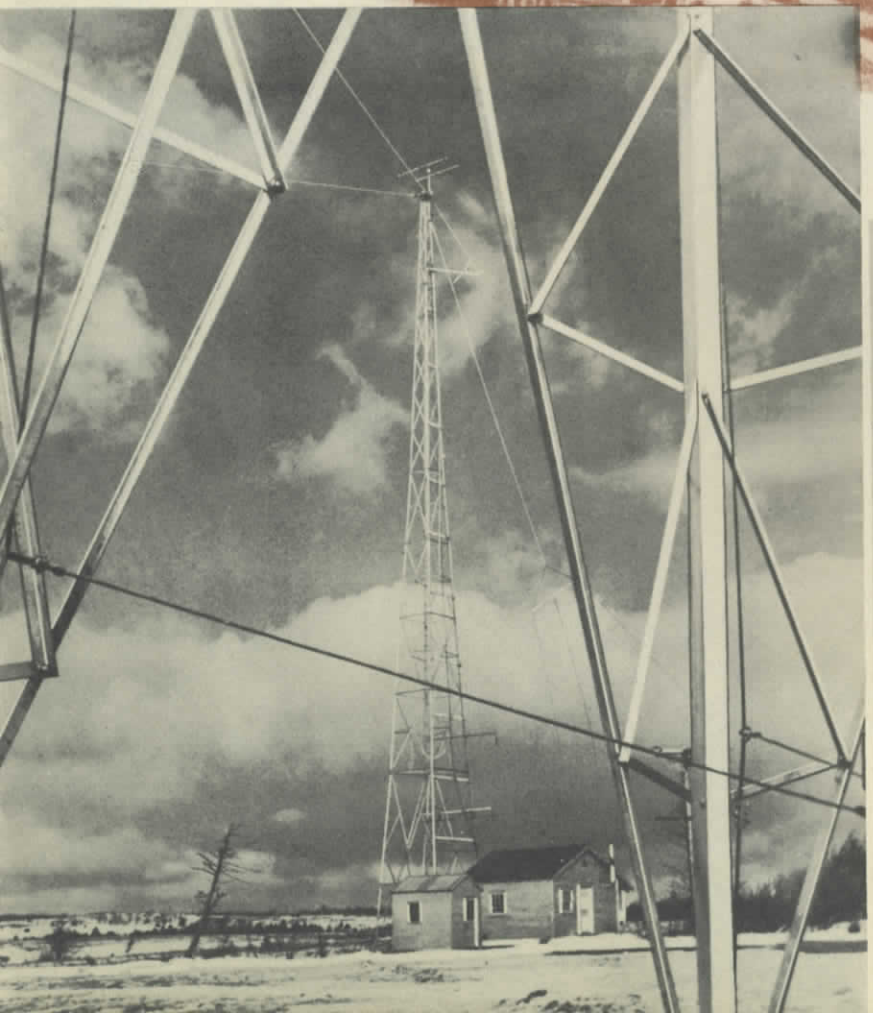
In the home set, the picture flies through the stem of the tube in a beam of electrons that plays across a fluorescent screen at the closed end of the funnel. There the electrical impulses are converted again to the varying degrees of light that form a picture on the screen of the television set. The sound is reproduced by the loudspeaker which is built into the home receiver.

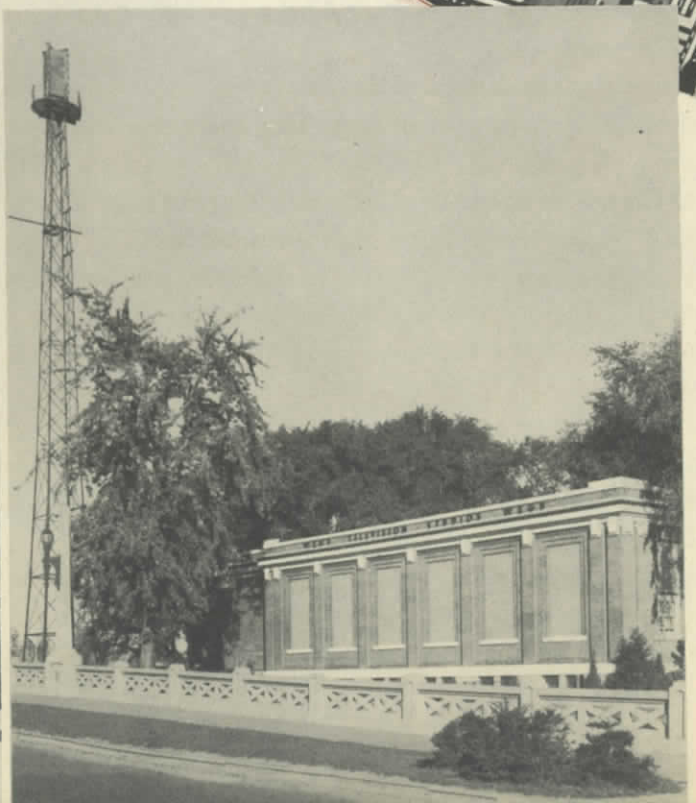
Sending television waves more than a few miles gave many headaches to scientists and engineers. Television waves—unlike the lower-frequency radio waves—do not follow the curve of the earth, but tend to move in a straight line like light, "jumping off" the earth at the horizon.

WRGB's main transmitter is not high enough to receive directly the waves emanating from New York City. However, a few miles from the transmitter and 129 air miles from New York City, on a peak in the Helderberg Mountains south of Schenectady, stands the General Electric relay station, W2XI. This station, the nation's first link in a television network, is located so that it can receive the waves from New York and send them easily to the main WRGB transmitter, where they are rebroadcast over the capitol district of New York State.









The WRGB transmitter, the relay station W2XI, and the WRGB studio in Schenectady, New York.

AT HOME...

". . . the Doctor of Alcantara," says the telegenic WRGB announcer. "We hope you will enjoy it!"

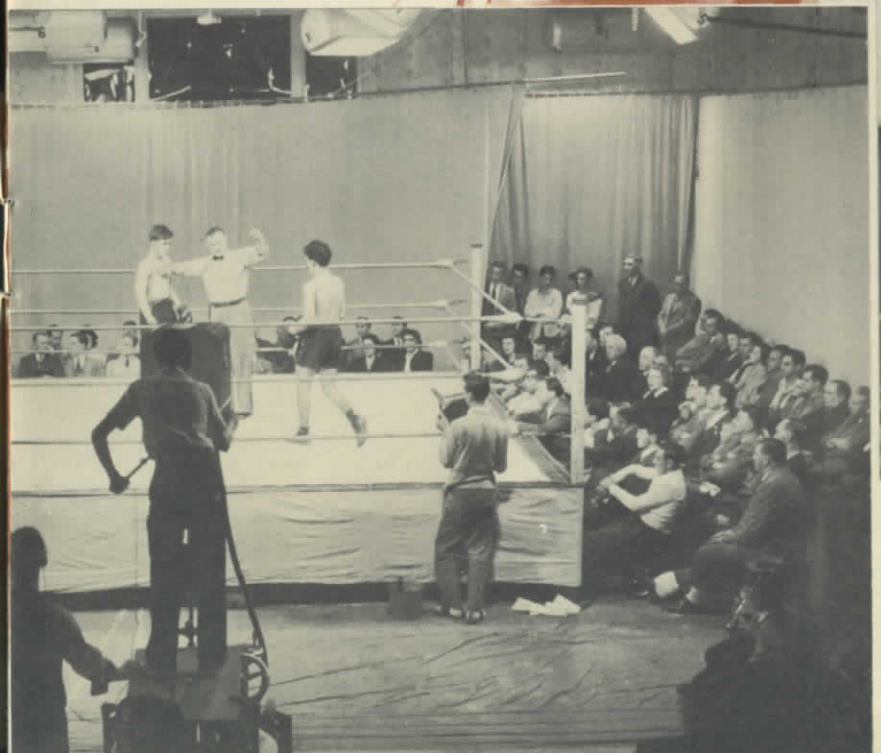
The first scene of the operetta is faded in, looking like a movie, coming over the air like radio.

As many as four million electrical impulses strike the home receiver every second, creating on the receiver screen 30 completed pictures in that same second.

Tonight's show is one of the types of entertainment most popular with WRGB's home audience. This audience has been organized by WRGB to criticize the programs telecast, in order that the studio staff may know the success of their experiments. Weekly program schedules sent out by the studio have space for comments on the technical reception as well as on the type of programs produced.

A survey of 499 programs in 31 different classifications produced during 18 months showed that light operas, news commentaries, and full length plays are favored in that order.

Sport-light: Although the sports' group, as a whole, was not among the first three in popularity, audience reaction to the boxing and wrestling matches, which are regularly broadcast during fall and winter, was so favorable that as a separate group it would have ranked a high first over all other types of programs.



Drama, sports, circus, fashion show–a few of the many types of program in television's growing repertoire.

GROWING PAINS...

"AS from Saturday, May 12, station WGY will broadcast television programs three days a week."

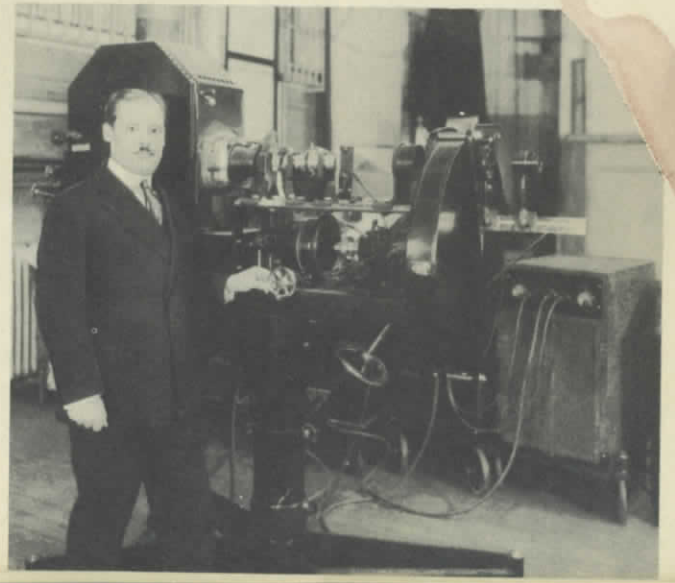
Largely responsible for this announcement in 1928 was General Electric's pioneer in television, Dr. Ernst F. W. Alexanderson. By 1927 Dr. Alexanderson had put together the first television system for transmission to the home. The camera outfit used contained a perforated scanning disk. Through the holes of this "sieve" from a 1000-watt lamp a flying spot of light flooded the subject's face. In two smaller cabinets were photoelectric tubes that converted the play of light and shadow on the face into electrical impulses.

These impulses were then transmitted to home receivers on the long radio waves used by WGY. But the pictures on the home receiver screen were haunted by other images that floated palely in, like ghosts. It was then that Dr. Alexanderson and his colleagues began reaching into the shorter waves for the transmission that ended the ghosting.

In the home television receiver at this time, the electrical impulses from the studio were amplified within the receiver and delivered to a neon lamp, which responded to the variations of the current to produce the lights and shadows of the picture.

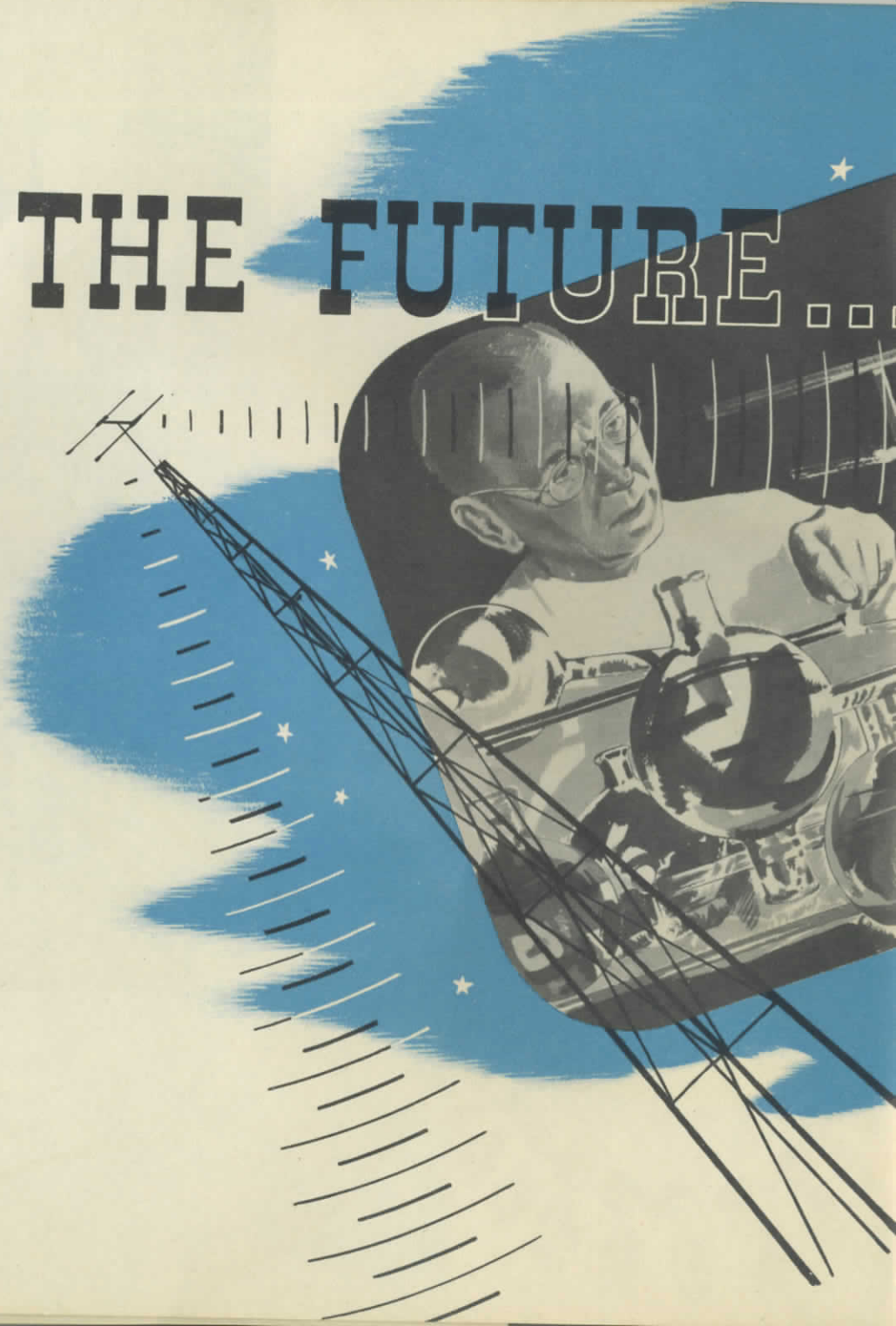
Some remarkable distance records were achieved in this period. In 1930, an experimenter in Berlin saw on a television screen the face of Professor August Karolus, of Leipzig, who at that moment was standing in the Schenectady station. In 1931 a rectangular figure was relayed from Schenectady to Australia and back, its outlines unbroken—around the world in one-eighth of a second!

Later came the cathode-ray picture tube and the electronic camera tube, keystones of modern television, with electron beams replacing the mechanical methods of scanning disks.



Opposite Page—the mechanical system of television, with Dr. Alexanderson, who has averaged one patent every seven weeks for 25 years. Above—the 1928 production of "The Queen's Messenger."

WAVES OF THE FUTURE...



TOMORROW scientists will reach farther and farther into the ultra-short waves of the upper radio spectrum.

Because television broadcasts require much wider channels than radio broadcasts, the number of channels available was limited before the war. But under the pressure of war developments, whole new regions of the spectrum have been opened up to practical and eventual peacetime use.

This use of the "microwaves" not only will mean more television stations to serve all of us, better technical operation to facilitate better and more varied programming, but—some day—television in full color. Because it has been proved to be quite within the range of practicability, color television will then bring us scenes in great variety in all their day and night naturalness.

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TOMO

ORROW....

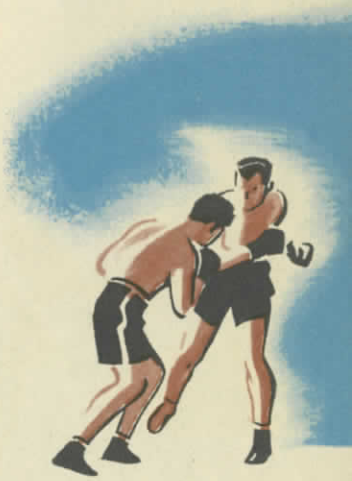
TELEVISION'S spectacular development as a means of communication will create a new industry for the post-war world—a many-sided industry requiring a variety of arts, professions, and trades.

War's mass production of cathode-ray tubes, previously very costly and often imported, as well as radio apparatus of all types, will take television sets off the luxury shelf.

The engineers' familiarity with the high frequencies used in electronic weapons of war will result in the projection of larger, clearer, and more variable scenes. Scenes that have only ordinary illumination, too dim for the pre-war picture tubes to "take," will appear on your television screen. Networks will permit the transmission of national events across the country. Thus right in your own home you will be able to see the battle for a World Series' pennant, and for a heavyweight championship. Right in your own horseshoe chair you will be able to see Mephistopheles tempting Faust. And it won't matter that you can't get tickets to the latest Broadway hit—you can tune it in on your television set!

Tomorrow you will experience the thrills of history in the making—news and events as they happen—in your fireside seat at the greatest show on earth—the eternal drama of living people, living.

For you, tomorrow, the world at your fingertips!



In recognition

of the year's outstanding contributions

to the art of

Television Programming

AMERICAN TELEVISION SOCIETY

presents the

A.T.S. AWARD

to

STATION WRGB

General Electric Company

· 1942–1943 ·

The efforts of the staff of WRGB were commended recently by the American Television Society when the station was given the society's annual award for "the greatest contributions to television program development of the year." The Society wrote, "We wish to pay tribute to the courageous viewpoint of the management for carrying on against all odds at a time when the future of television depends to so great a degree upon you."

SOME HIGHLIGHTS OF G-E TELEVISION HISTORY

1926—Dr. E. F. W. Alexanderson, G-E engineer, developed a mechanical method of television.

1927—Experiments using a rotating perforated scanning disk proved successful.

1928—January—First public demonstration of television in Dr. Alexanderson's home.

May—WGY, G-E radio station in Schenectady, became pioneer television station, with regular schedule—three afternoons a week.

August—First remote pick-up, of Governor Alfred E. Smith making acceptance speech at Albany, N. Y.

September—First play presented on television—"The Queen's Messenger"—over WGY.

1929—G-E engineers produced television images by means of cathode-ray tube—forerunner of the modern picture tube.

1930—May 22—Television projected on a large screen, before a theatre audience, for the first time, at Proctor's Theatre, Schenectady.

1939—June 10—First long-distance reception of modern high-definition television, in Helderberg Mountains, 129 miles from New York, of King George and Queen Elizabeth touring New York World's Fair.

1940—January 12—First television network put into service with G-E relay station and television transmitter WRGB rebroadcasting to upstate New York area programs originating in New York City.

November 20—Color television demonstrated in Dr. Alexanderson's home.

GENERAL ELECTRIC

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