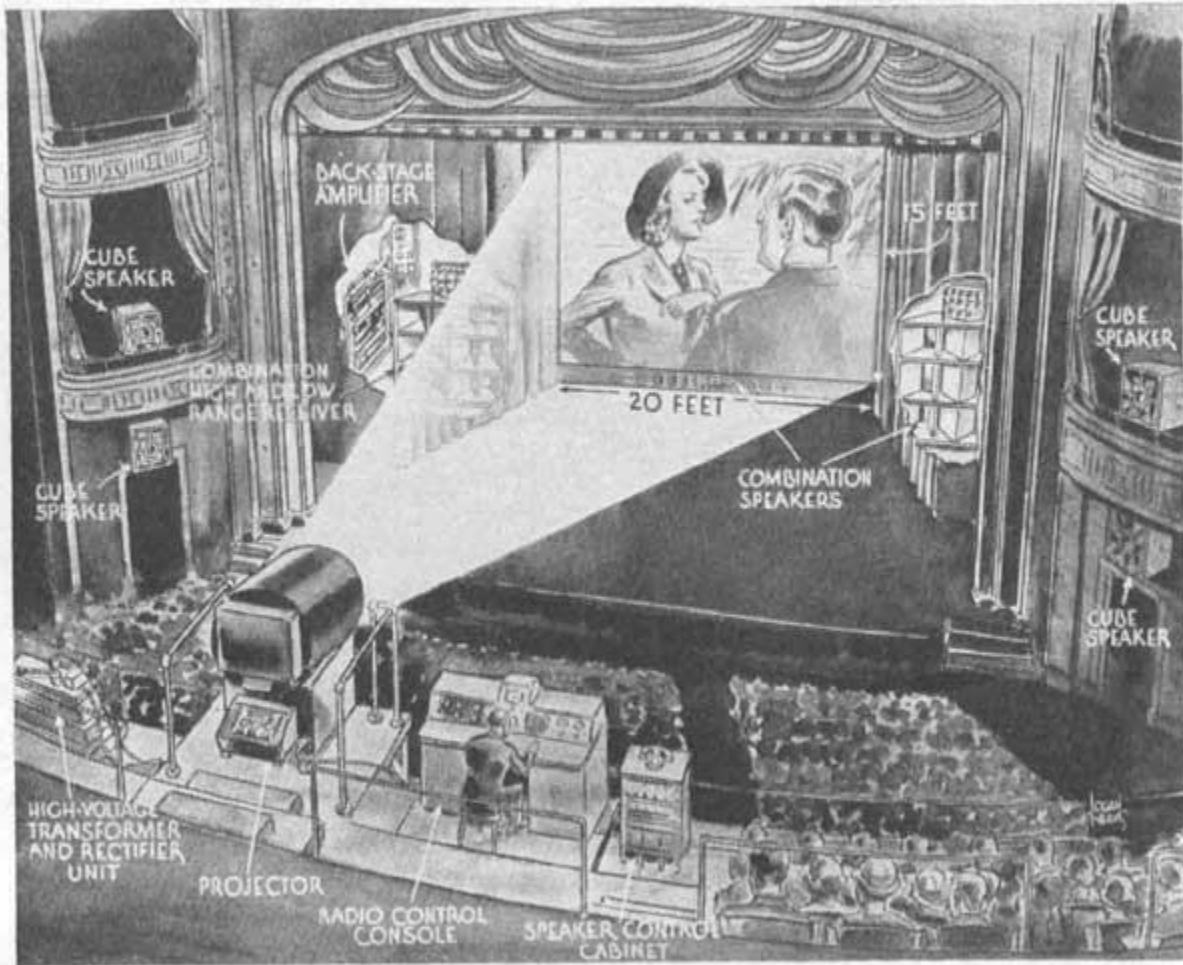


Large Screen Television



An artist's conception of the equipment layout used by RCA for its television theatre installation in New York.

NEW TELEVISION COVERS STANDARD THEATRE SCREEN

RCA Equips New York Theatre to Show Television Pictures

Large screen television equipment projects a 15 by 20-foot picture on the screen in the New Yorker theatre, 254 West 54th Street. There is featured, in addition to new developments in projection, a new multisonic sound system developed by RCA Laboratories for use with the television screen.

A steel-barreled projector pointed over the edge of the balcony casts the television images on the stage screen 60 feet distant. Alongside the projector are control desks at which operators manipulate the knobs that regulate the picture and sound. These operators exercise the same control over faces and scenes as radio control men do over broadcast music and speech. The pictures, as they come over the wire from an outside point, are received first at the control desk to be fed into the projector. In today's demonstration the Camp Upton scenes relayed by radio to the RCA building are forwarded from Radio City to the New Yorker Theatre over special wire circuits.

Uses Multiple Sound System

The sound reproduction system used in connection with the theatre television unit is of the extreme high fidelity type, similar in effect and arrangement to the "Fantasound" used in the motion picture "Fantasia." Differing from Fantasound in that it is manually controlled at the scene of reproduction, the multisonic system permits movement of sound with action on the screen, rotation of sound around the walls of the auditorium, and emanation of sound from any one desired point in the theatre.

Developed in the RCA Laboratories, the large-screen theatre television system operates on signals delivered to it either by coaxial cable or by special wire circuits.

The installation in the theatre consists of three main units: control, power supply, and optical system.

An array of knobs and dials on the control panel gives the operator immediate handling of all controlling, metering, and deflecting elements. He can obtain at any time, every possible check on the operation of the system. Sharpness, brightness, contrast, and size of the image projected may be changed by

the turn of a knob. The controls are so simplified that the average motion picture projectionist could operate the unit with but slight training.

High Voltage Required

The second unit, the power supply for the optical or projection system, is a conventional high-voltage rectifier rated at 70,000 volts. Normally, operation is at 60,000 volts.

The optical, or projection unit, is considered the most important as well as the most complicated of the entire system. For purposes of description, it is possible to divide the unit into three principal elements; that is, the kinescope, or projection tube; the reflecting mirror, and the correcting lens, or plate.

The kinescope, built to handle high voltages, is similar in performance to the kinescope used in RCA's standard home-television receivers. The face or diameter of the tube is 7 inches; the tube's length is 14 inches. It is mounted in the center of a hollow steel-shielded cylinder 34 inches in diameter and 34 inches long. The face of the tube is pointed away from the stage screen, and the end of its neck pierces a small hole in the center of the correcting plate of the optical system.

The concave reflecting mirror, 30 inches in diameter, is mounted a few inches in front of the tube's face. The image on the face of the tube is picked up on the concave

surface of the mirror, passed through the correcting lens and onto the screen with a magnification of 45 times. The lens corrects for aberrations and passes the image across the auditorium to the stage screen.

Unique Optical System

The optical system is unique in that it has a speed rating of $f: 0.7$, which surpasses the fastest known projection lens. It was developed by research engineers in the RCA Laboratories, and is a variation of the Schmidt astronomical camera. Optical experts viewed the idea in the beginning as impractical, but one of the RCA engineers, whose hobby is optics, figured out a formula, devised special grinding instruments, and successfully developed the optical system. The first unit required six months to produce, but the technique of grinding the lens was improved to the point where the one used today was ground in six weeks.

The optical unit housing is mounted on a pedestal which contains the video amplifiers and the deflecting output circuits. Because of the optical unit's high efficiency, the screen illumination obtainable in the RCA system is adequate for large-screen pictures in theatres.

Central Sound Control

Controls for the sound, which accompanies the television projection, are mounted in a separate console, adjacent to the television control desk. They are linked to 18 high and low frequency loudspeakers mounted around the auditorium. Wire lines connect the console with the NBC studios and with the central radio receiving point in Radio City.

Three banks of regular RCA Photophone speakers are set up on the stage near the screen. One bank is at the rear of the screen, and the other two are at either side. Beginning at the outer edge of the proscenium arch, other loudspeakers are located at desired points along the side wall and in the rear of the auditorium. One large loudspeaker is suspended from the ceiling.

In installing the sound equipment, engineers incorporated the latest improvements developed by RCA for motion pictures and radio, as well as recent discoveries in the laboratory. Potentially, the equipment is expected by engineers to create a vivid illusion of realism. At present, however, it is viewed as experimental.