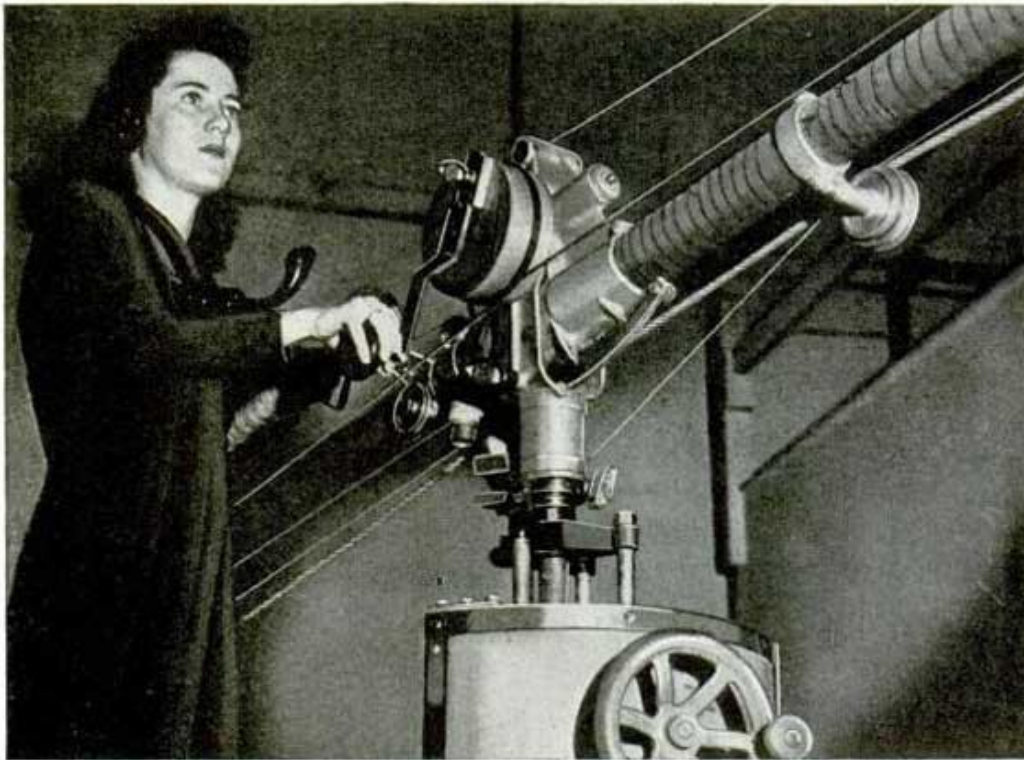


TELEVISION - *The* NEW WAR BABY



With a turn of the crank, boom operator moves microphone forward during closeup shot in television studio

AND remember, folks, tune in to your favorite television station for the opening game of the World Series this afternoon."

That's the kind of radio announcement that we can expect to be hearing two or three years after the war is over. It will take no longer than that, television experts believe, for television to sweep the country just as radio did in the late 'twenties. Estimates have been made that television is to become a billion-dollar-a-year industry.

The fact is, television is here already and except for the war more of us might now be arguing with the man next door over the relative abilities of our radio vision receivers. About a dozen television transmitters are broadcasting on regular schedules in the United States and there are well over 6,000 receivers in use.

When television receivers are put on sale again, what will they be like? A typical set might be a console cabinet model priced at from under \$100 to as much as \$600. It will include static-free frequency modulation circuits coupled automatically to the television picture channels so that one tuning knob brings in both sight and sound. There will be a standard all-wave radio

sound receiver in the cabinet as well, and possibly a record playing attachment.

The fluorescent face of the cathode ray tube that serves as the viewing screen of the receiver may be from five to 20 inches in diameter, on which a brilliant image will appear without flicker or distortion. Larger viewing screens similar to motion picture screens no doubt also will be available, the television picture being flashed on this screen by a special high-intensity scanner.

This general forecast is an easy one because receivers such as these have been built and used although they are not now being manufactured for sale. After-the-war television will further improve when the results of electronic research now being conducted for military purposes become available. The television industry has agreed that transmitters and receivers will continue to be of a uniform design in the sense that all receivers are able to pick up all transmitting stations within range.

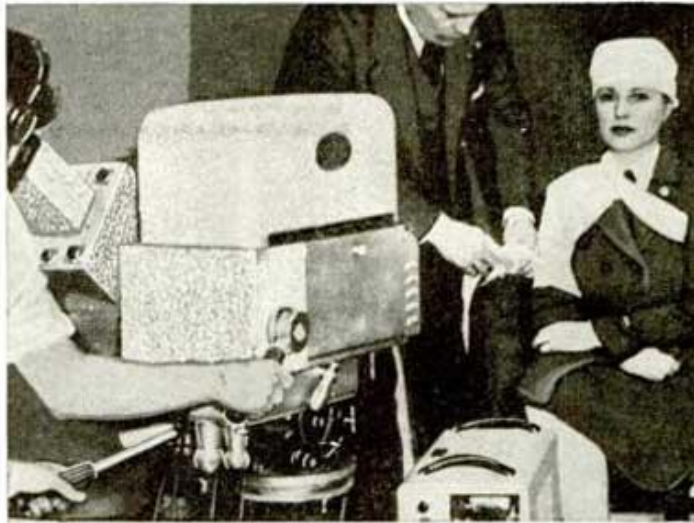
Among the future improvements that can be foreseen is simpler tuning. At present a television receiver requires a number of controls, including a channel selector, a fine tuning knob, contrast adjustment,

brightness or intensity control, synchronization controls to "lock" the picture in its position on the screen, a focusing control that concentrates the electron stream inside the cathode ray tube, and a volume control for sound. Automatic regulation of some of these adjustments is expected.

Another probable improvement will be elimination of interference such as is caused by nearby diathermy machines or automobiles. An integral electronic color system seems possible. Color transmission and reception have been done successfully but engineers aren't sure that the simplest, most satisfactory color system has been developed.

For a look at a modern television transmitter, let's visit W6XYZ, owned by Television Productions, Inc., and located at Paramount studio in Hollywood. W6XYZ uses DuMont equipment augmented by apparatus and improved circuits developed by Klaus Landsberg, the station's director.

This television station at present devotes its regular bi-weekly broadcasts to civilian defense subjects. It radiates sight-and-sound demonstrations on how to seal your home against poison gas, how to extinguish incendiary bombs, and tips for air raid wardens. Experts in first aid show how injured people should be cared for, and once a week an instructor in judo and self defense gives a complete lesson on some aspect of personal protection. On a mat in front of the television camera he shows how an attacker might strike at you, then takes up step by step the defenses that you could use. Television receivers at sub stations



Red Cross instructors teaching first aid by television. Below, twin receivers in transmission room are used to study picture being radiated

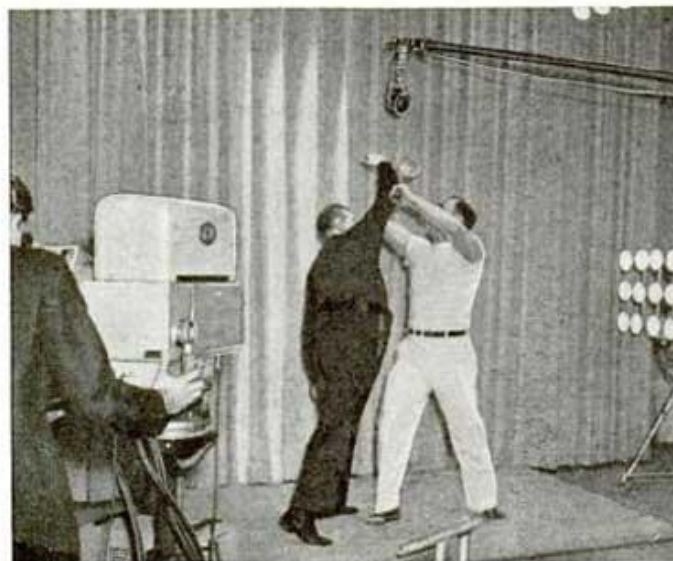




Cathode ray tubes of various sizes used in television receiving sets



Touching up backdrop for a broadcast. Below, judo instructor goes before camera



of the Los Angeles police department are tuned to W6XYZ during the broadcasts so that police and auxiliary police may watch the lessons.

Putting on a television program combines the intricacies of making a motion picture plus the mechanics of operating a radio broadcast station. A program requires experts in lines ranging all the way from makeup to sound and picture transmission. Operating with a minimum staff during the war, W6XYZ uses men for only the most technical posts. Girls act as stage

managers, and as camera and microphone boom operators.

Several rehearsals of each program give the actors time to work out their actions. At the rehearsals certain areas are assigned to each action and the stage manager carefully observes that the action remains in the focal plane of the cameras. The lighting technician, who also serves as stage hand, uses light banks that are not as bright and glaring as were required several years ago. New camera tubes that have greater sensitivity require less light for the scenes. The final dress rehearsal a few hours before broadcasting time is complete in all details except transmission.

When W6XYZ goes on the air it first radiates a test pattern and recorded music so that the television audiences can adjust their receivers to greatest fidelity. Two television cameras are used during the program so that the broadcast may be switched

from a long shot to a close-up or to a change of scene without interruption. The camera operators pan their cameras to follow the action, keeping the scene in sharp focus. The microphone boom operator swivels the overhead microphone back and forth to pick up the speech of the actors.

Behind the cameras, Mr. Landsberg watches the action and directs the staff from his post in the glass-enclosed control room. All the technicians wear ear-phones so that the director can talk to each without interfering with the program. In the control room, too, are the sound control operator and the picture control oper-

POPULAR MECHANICS

ator. This last technician sits behind a bank of instruments that include picture monitors that show the scene being viewed by each camera. He makes electrical adjustments to eliminate distortions, to provide the right amount of contrast, and to control the brightness of the pictures. He watches a cathode ray oscillograph to keep track of the wave shape patterns, and switches the transmitter feed from one camera to the other as the director calls the shots.

Final control of the television picture is exercised by the transmitter operator at the panels in another room of the station. He has two television screens in front of him, one that shows him the picture as it comes to him direct from the control room, and one that shows the picture that is being radiated through the air. His job is to keep the transmitter adjusted so that the picture being broadcast agrees in quality with the picture coming from the control room. This outline, of course, tells only part of the work of operating the station.



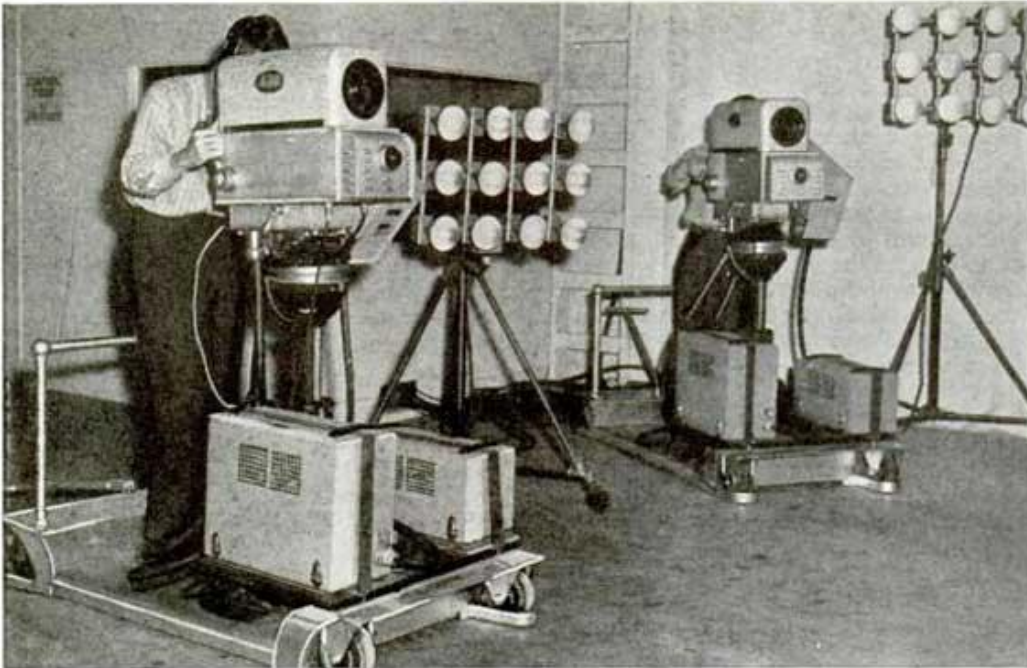
Busy picture control operator keeps sharp eye on the instrument board

The average range of a television transmitter is from 50 to 80 miles, although pictures are sometimes received as far as 150 miles from a transmitter. The short range is due to the ultra high frequencies used for television. The ultra short waves travel in straight lines and in theory are limited to the transmitter's optical horizon.

Actually, some receiving stations that are beyond the optical horizon or that are

Mobile television unit mounts cameras on top of truck and beams picture to main transmitter for broadcast





Backstage at a television studio combines intricacies of movie studio and radio station. Here are two rolling cameras and banks of stage lights, the microphones (not shown) are above

blanked off from the transmitter by intervening hills sometimes receive satisfactory pictures. These exceptions suggest that methods may be found by which the range and "coverage" of transmitters can be increased. In the future it may be that national networks of television stations will be hooked up through relay stations or by co-axial cables, each transmitter then radiating the same program to receivers in its adjacent territory.

Directional, two-element receiving antennas are used for receiving greatest sig-

nal strength. Because of their optical quality, television waves are frequently reflected from the surface of an obstruction. Thus a receiving station near the foot of a mountain sometimes gets its best picture when the directional antenna is turned so as to pick up the ultra short waves that are being reflected from the mountainside. A similar phenomenon sometimes causes the television picture on the screen of a receiver to suddenly increase in brilliance when an airplane is flying overhead. This is because the surfaces of the aircraft reflect the waves down to the receiving antenna. Occasionally a passing airplane causes a "negative" picture to show on the receiving screen.

Motion pictures, stage plays, spot news and sports events, and educational sight-and-sound features are some of the things that television can put on the air. It won't be long, now, before you will be watching these programs on the screen of your home receiver.

Testing a television receiver by means of a signal generator and a cathode ray oscillograph in laboratory at station W6XYZ



Testing a television receiver by means of a signal generator and a cathode ray oscillograph in laboratory at station W6XYZ