

# Radio News

November, 1936

## TELEVISION *as GOOD as* HOME MOVIES

Being a report of a television demonstration staged in Philadelphia in which sight and sound programs were received in a home with a scale of picture detail, accompanied by high-fidelity sound reproduction, good enough to be accepted immediately on the basis of commercial broadcasting. Fundamental technical data on the system is also presented for the benefit of amateurs and experimenters thinking about building.

*By The Television Reporter*

**W**HAT was undoubtedly one of the finest demonstrations of television transmission by radio was viewed by your reporter, recently, when Philco

Radio and Television Corporation transmitted sight and sound programs from their main laboratory in Philadelphia to the home of W. H. Grimditch, seven and one-half miles distant from the transmitter.

One thing that impressed us in the demonstration was the total absence of flicker and the smooth definition of the received pictures, which reminded us exactly of our own home moving-picture outfit in clarity of detail. This definition was great enough to allow the picture and writing on a package of Camel cigarettes to be read at the receiver when placed in front of the televisior (advertisers make note).

### Defects Absent

This was the first time that we have viewed a demonstration of television in which the small but nevertheless bothersome inequalities of detail, small specks, wobble, did not interfere with the

continuity of the picture being transmitted. In fact, they were absent and the feeling of actual vision, of the thing you are looking at, was experienced for the first time.

### TELEVISION PICTURE "SNAPPED" BY RADIO EDITOR

*This picture was actually photographed, during the demonstration, with a small hand camera directly from the screen of the television receiver, after the image had been sent through the air, by ultra-short-wave radio, a distance of 7½ miles. Do you think it good enough for commercial broadcasting?*

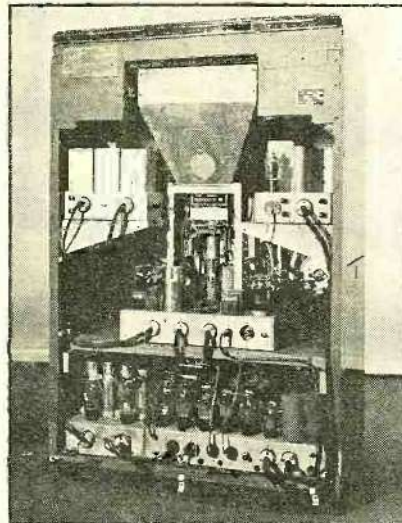


The picture on this page was taken with an ordinary camera focussed on the screen, by one of the editors as the program went on. It really suffers by being a photograph of a photograph and also in being made into a cut for reproduction on this page, but at least it does give an idea of the smooth and natural pictures that were seen.

### What Was Seen

During the demonstration, artists selected from the Philco staff, including singers, dancers and a whole quartet were viewed and heard. The inimitable Boake Carter was interviewed from Mr. Grimditch's home by telephone to the television studio. Mr. Carter was seated at a small table with the telephone in front of him and his answers to questions and comments about television were very much to the point. It was interesting to note the changes in expression on





#### FRONT AND REAR VIEWS OF TELEVISION RECEIVER

*At the left is the front view, showing the loudspeaker grills, the tuning knobs for the video and audio signals and in the slanting lid, the mirror which reflects the pictures to the looker and listener-in. At right: Rear view showing the various classes for scanning, signal reception and the power units.*

his face coming to us by television as he made a point or as he stressed an idea, with words which came to us from the loudspeaker. If all the broadcast listeners who hear his news comments daily could only have seen his face as we did, they would have had even a better insight into the quick perception of that very active brain.

#### What a Fight!

Another scene, that had us "lookers-in" up on the edges of our seats, was a one-round contest in which the boxers (drawn from the factory force) put up a lively "scrap" in a ring built outdoors on the roof. This scrap was climaxed by one of the contestants knocking the other clear out of the make-shift ring. Actually he took the whole ring with him, railing, posts and everything; all the details of this were easily shown and were quite unexpected and humorous. Even the announcer could hardly stop laughing at the incident.

One of the most significant features of the whole demonstration was the running of a one-reel moving picture showing the exploits of a wild-life collector

catching various animals by a novel, method; catching them with his hands. He dived from the banks of a jungle stream into the water after alligators, fish, huge turtles, otter, and actually outswam his victims. Some of these views were "under-water" shots and we were sorry to see the end of the picture arrive. When television comes (and it is on the way) moving pictures such as this can be viewed right in our own homes, and the moving picture industry had better watch its laurels! It seems to us that moving pictures and television will have to be very closely tied up in the future and it would be only logical to expect that the moving picture industry will associate themselves with, or control, the interests who will do our future television broadcasting.

#### A SUBJECT BEING "SCANNED"

*This young lady, who sang for the audience, is shown before the television camera with an operator focusing the device just as the test television program started.*

But now for some of the details of the Philco television system. Some of this information will be important to those amateurs or experimenters who are thinking of building experimental types of television receivers and are trying to learn the fundamentals on which future broadcasts will be based. The electrical specifications for this system are as follows. The carrier frequency of the picture transmitter is 51 megacycles. The carrier frequency for the sound transmissions was 54.25 mc. This makes a spacing, between the two carrier centers, of 3.25 mc. approximately. The total space taken up in the ultra-short-wave spectrum is 6 mc. The number of scanning lines was 345, but this is being changed to conform to the R.M.A. recommendations of 440—450 lines. The number of pictures-per-second transmitted were 60, 30 of them being interlaced. By "interlacing" is meant that the lines of each consecutive frame show in between the lines of the preceding one. This reduces the rather striped appearance of earlier methods. The polarity of the transmission is negative. The aspect ratio is 4.3. The percentage of television signal devoted to the synchronizing signal was 20 percent. The wave-form of the

*(Turn to page 308)*

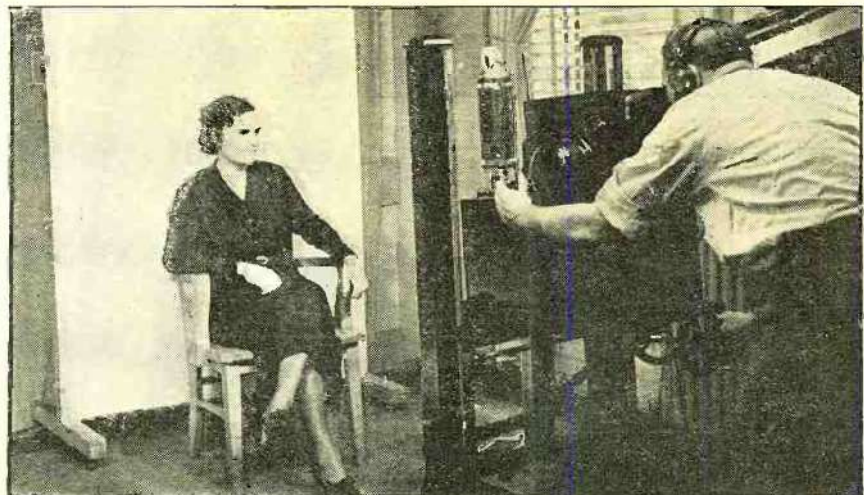
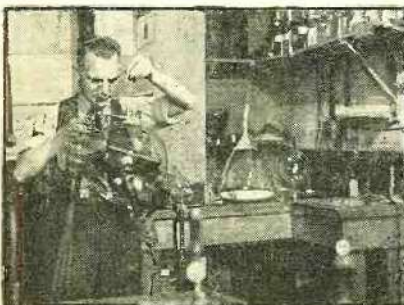
#### NEW JOBS FOR TECHNICIANS

*There will be many calls for operators of television transmitters, men who understand both radio and television, when this art becomes established on a commercial basis.*



#### MAKING AN ELECTRIC EYE

*This laboratory worker is shown putting the final touches on the glass bulb of the photo-electric device which converts the visual scene into electric impulses for transmission.*







**OFFICIAL RADIO SERVICE HANDBOOK**

PUBLISHED only a few weeks ago, the OFFICIAL RADIO SERVICE HANDBOOK by Bernalsey, is the most modern, up-to-the-minute volume on radio servicing. Contains over 1,000 PAGES filled with vitally important service data—over 1,000 illustrations.

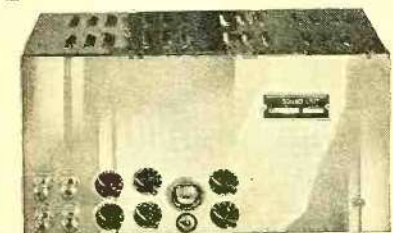
**OVER 250 PAGES OF OPERATING NOTES**  
The section on Operating Notes contains valuable information supplied from personal notes of hundreds of Service Men for over a thousand manufactured receivers.

Other highlights of the OFFICIAL RADIO SERVICE HANDBOOK: **CIRCUIT THEORY AND ANALYSIS**—Circuit Fundamentals, Tuning Circuits and Aligning Data, Volume Control, Tone Control, A.V.C., Resonance-Indicator Circuits, A. F. Amplifier Systems and Power Supplies, Speakers, Pickups, Phono-equipment, Commercial Receivers; **SERVICING EQUIPMENT**—Fundamentals of Test Instruments, Commercial Equipment, Cathode-Ray Oscilloscope, Building Test Instruments, Localizing Trouble, Short Cuts, Unusual Servicing Experiences; **STANDARD AND SPECIALIZED RECEIVER AND INSTALLATION DATA**—All-Wave Receivers, Auto-Radios, Noise Interference; **MODERNIZATION AND CONVERSION DATA**—Receiver Conversion Work; **SOCIAL AND ECONOMIC PROBLEMS OF THE SERVICE MAN**—Improving Knowledge and Technique, Upholding the Profession; **OPERATING NOTES FOR STANDARD RECEIVERS.**

Order your HANDBOOK today—use the coupon below.  
**GERNSBACK PUBLICATIONS, Inc. 99 Hudson St., New York, N. Y.**

**GERNSBACK PUBLICATIONS, Inc. RN-116**  
99 Hudson Street, New York, N. Y.  
Gentlemen: Enclosed please find my remittance of \$4.00 for which send me immediately. **POSTPAID.**  
One copy of the OFFICIAL RADIO SERVICE HANDBOOK by Bernalsey—just published.  
 Please send HANDBOOK to me C. O. D.

Name.....  
Address.....  
City.....State.....  
 Please send complete literature on HANDBOOK.  
(Send remittance by check or money order. Register letter if you send cash or currency.)



**THE SENSATIONAL "30-60" 28 SOUND SYSTEMS IN ONE!**

The MASTERPIECE "30-60" is the only truly universal sound system being built today. It will cover an outdoor audience of 50,000 people—or 1,500 pairs of headphones in a hospital. It is the most flexible sound system ever designed in terms of inputs, outputs and power output of anything from one watt up to sixty-four honest man-sized watts at 2½ times less than customary total harmonic distortion. It has a dozen entirely new technical features—and such mechanical advantages as rack mounting, wall mounting and portable operation all in one unit.

Any MASTERPIECE amplifier may be purchased on Easy Terms with a 5-Year Guarantee and a Free Trial under your own conditions. Send the coupon for full details.

**McMURDO SILVER MASTERPIECE AMPLIFIERS**

**FULL DETAILS FREE MAIL THIS COUPON**

**McMURDO SILVER CORP.**  
3356 N. Paulina St., Chicago, Ill., U. S. A.  
Please RUSH me full details on MASTERPIECE amplifiers.

Name.....  
Address.....

**Television Like Home Movies**

(Continued from page 266)

synchronizing signal is narrow and vertical.

The focussing device for picking up the television signal actually looks somewhat like a camera on wheels. It contains a large tube, operating on photo-electric and cathode-ray principles combined. This tube generates, by an electrical scanning method, voltages corresponding to the light and shade of the television picture which is focussed by the lens onto the signal plate of the tube. A special amplifier in the control room strengthens these varying voltages about 10,000 times, to modulate the ultra-high-frequency transmitter. Also mixed with this television signal, as it is transmitted, are the synchronizing and blanking impulses. These impulses when received by the receiving set control the movement of the electron beam in the receiving cathode tube which rebuilds the picture.

In the studio there were, of course, accompanying the picture transmitting apparatus, microphones and audio-frequency amplifiers and another radio transmitter for sending the sounds to our receiving location.

A separate pick-up device consisting of a specially built projector, was used for transmitting the motion picture part of the program. This apparatus energizes the same radio transmitters that were used for televising the actual scenes.

The receiver used at Mr. Grimditch's home, over which we saw and heard the program, comprised a combination sound and television receiver, an experimental Philco model which tuned over the frequency range of 42—86 mc. These receivers tune the sound and sight channels, separately, and tuning in the dual program was accomplished very much as one would tune the usual sound receiver. They are not at all difficult to operate. Front and rear views of this receiver are shown on these pages. The rear view shows (at top) the metal container for the cathode-ray tube and surrounding this are the units for synchronizing and controlling the beam. The power units are distributed along the bottom of the cabinet.

The total number of tubes used in the set is 36. Looking at the front of the cabinet one can see (at the top) the hinged mirror which reflects the picture to the listeners' eyes and lower down on the front of the cabinet (at right and left) the sound and television tuning knobs and dials.

Philco officials stated that they have been working steadily but quietly on television for a number of years, first using 60-line scanning disks in 1928. In 1932 they started transmissions over their experimental station W3XE transmitting 240-line pictures by an electronic method. The next work carried them through the necessary research work in the vacuum tube laboratory, on special tubes to be used in the system. We understand that Farnsworth collaborated in this work. The next experiments were made with 345 lines and in due course the necessary wide-band amplifiers were developed and improved. Other special new tubes were designed to meet the requirements and once again defects and distortions had to be eliminated one by one. The first experiments with 345 lines were made by wire; then later the experimental television transmitter W3XE was rebuilt and the power increased to 1½ kw.

Next in line came transmitting experiments, over the city of Philadelphia and its suburbs, to find what power was necessary to flash television signals to distances in a circle at least 7 miles from the trans-

mitter. Various types of antennas and transmission lines were tested. A special mobile truck was employed, fully equipped with television apparatus, for plotting field strength for satisfactory service throughout the city.

Along with this work were researches in combination television-and-sound receivers, to develop the apparatus necessary to receive the programs.

With all these units of a complete system developed and operating satisfactorily, field tests were started on the system in December, 1935. Many changes have been made since then and starting in June, 1936, another series of experimental programs were broadcast nightly by the station on 51 and 53.25 mc. As a result of these tests the present apparatus used by Philco was developed so that this very excellent demonstration could be made. Philco engineers tell us that work is now progressing on still another stage of progress. Mr. Larry E. Gubb, President of the company, when asked how soon we would have television commercially, stated "Commercial television will not come during 1936", but he added "Television is going to be a tremendous industry when it does come." Mr. James M. Skinner, Chairman of the Board, stated that he "believed television sets could be sold as soon as a reliable service started." Sayre M. Ramsdell, Executive Vice President of the company told us that "Philco's main objective in television, at present, was to produce and receive a good picture." He also said he "would hate to see a patent monopoly set up in television," although he thought a patent pool like that in the automobile industry, so that everybody could use these patents to build a big industry would be advisable. He also stressed the point that a single set of television standards should be arrived at and that this standard should be set high enough to give definition as good as home moving pictures.

**The "Spiderweb" Snags All Waves**

(Continued from page 292)

guy rope which was used in this particular installation to counteract the pull of the transmission line which would otherwise pull the antenna out of shape.

At the receiver end of the transmission line is another matching transformer which automatically selects the proper antenna for the frequency to which the receiver is tuned. This selection is accomplished electrically and therefore does not involve any mechanical operation on the part of the listener. The transmission line is simply connected to the two terminals provided for it on this transformer and the other transformer terminals are connected to the antenna and ground terminals of the receiver.

At first glance this antenna may appear to be a rather complicated arrangement but after all it is only by means of complicated arrangements that good all-wave reception is possible. Actually, all of the complications in this case have been taken care of by the manufacturer with the result that all the fan has to do is to erect the antenna according to instruction which come with it.