Successful Television Accomplished on Broadcast Band

Although the opinion has been expressed, by many radio engineers and government radio experts, that television on the regular broadcast band is practically impossible of accomplishment because of the 5,000-cycle modulation limit under which all broadcast stations operate, a group of Chicago experimenters has actually performed the feat to the satisfaction of a number of that city's radio experts and leading television skeptics.

A highly-successful demonstration was given late in June, the transmitting being done through station WCEIL on its regular 620-kilocycle wave. The receiving was done with a commercial neoncope installed in a club house several miles from the Municipal Pier, on which WCEIL's transmitter is located.

E. F. Noonke, secretary of the Chicago Federation of Labor, was the subject who was "televised." Several of his friends who witnessed the demonstration in the club room had no difficulty in recognizing the image of him that appeared in the receiving apparatus, yet the operators in charge of the equipment stated that not only did the television signals stay within the legal 5,000-cycle limit, but they seemed actually sharper than ordinary voice and music impulses.

The television transmitting equipment used for this demonstration, and also a test receiver employed for experimental work in the WCEIL laboratory, are shown in the pictures on this page and the following one. The apparatus was designed by Ulises A. Sanabria, a young experimenter who has been working quietly on television for the past five years, and by his assistant, M. L. Hayes. They have had the helpful cooperation of Virgil A. Schoenberg, chief engineer of WCEIL. No pictures were taken of the receiving apparatus actually used for the radio demonstration, but a good idea of its construction may be obtained from Fig. D, which shows a duplicate of the model.

Construction of the Transmitter

In general arrangement, the television transmitting apparatus used by Sanabria is a development of the well-known Yves system, but it is considerably simpler than the complex machines used by the Bell Telephone Laboratories and the General Electric Company in the demonstrations these companies gave during the past year. Fig. D shows the complete instrument set-up at WCEIL. The transmitter, the parts of which are designated by the letters P, L, D and A, is in the background, while the "checking" machine, which is a television receiver connected by direct wire to the transmitter for monitoring purposes, is in the foreground.

As shown in Fig. A, the first unit of the television transmitter is a powerful spotlight, A, which may be an arc light but which in this case is a 1,000-watt mazda lamp inside a protecting case. Revolving in front of the aperture through which the light of this lamp issues is a disc B, drilled with a spiral of tiny holes. The synchronous motor M drives this disc through the belt B. An important feature of the mechanical construction is the weight and rigidity of the parts; the shaft to which the disc is attached revolves on ball bearings in a heavy cast-iron frame, which in turn is bolted to a massive cast-iron base which also supports the driving motor. The disc itself is of thin metal, but faced with two flanges 1/4-inch thick, which overcome any tendencies on its part to wobble. As pointed out in the article on page 222 of this number, a variation of this kind, if allowed to develop, will ruin the transmission.

After the light from the lamp passes through the holes in the disc, it is concentrated by a powerful condensing lens, L, in such a manner that tiny pinhead beams are projected straight forward. One such beam is indicated by the dotted line in Fig. A. Of course, as the disc revolves, a continual series of beams will be thrown forward.

The person to be televised sits in a shaded booth (see Fig. B), facing directly into the lens, but about four feet from it. In front of him is a large wooden box with a square hole in its center to allow the light to pass through. Surrounding this opening is a bank of four phototronic cells, marked P' in Fig. D. A close-up of this booth and the phototronic-cell box is shown in Fig. B, with Mr. Hayes acting as the subject.

Television a Subject

The operation of the apparatus now becomes evident. As the disc revolves, it
The complete experimental television at WCLF. The parts of the transmitter are: P, photoelectric cells; L, condensing lens; D, scanning disc; A, source of light. Receiver (in foreground): PA, amplifier; RM, driving motor for scanning disc, RD; T, neon glow tube. M. L. Hayes, left; U. A. Sanabria, wearing glasses; V. A. Schnoberg, rear.

The images visible in the check receiver, as viewed by a member of the station staff, were really very good. It is difficult to describe the exact grade of their definition, but it can be said that the televised faces are distinctly recognizable. The images are streaked with the fine lines characteristic of television disc systems, but they are distinct enough to show the expression of eyes and eyebrows on the subject's face and the shadow of his mouth.

The photoelectric cells

Much of the success of this television work at WCLF is due to the photoelectric cells. They measure nine inches in diameter, are of the potassium type and extremely sensitive. The direct output of three of the four cells shown in the illustration, when led through only five stages of resistance-coupled amplification, is sufficient to operate the check receiver quite satisfactorily. These cells, as well as three twelve-inch 

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be used and enough turns should be placed on the plate winding to cause regeneration of the highest desired wavelength. The plate winding may be located on the same coil form as the secondary and should be placed at the filament end of the latter coil. Also, in regenerative circuits of this type, an R.F. choke coil must be connected in series with the output circuit, to prevent the R.F. current from returning to the filament through the phones rather than through the plate coil.

(To be continued next month)

Successful Television on the Broadcast Band

(Continued from page 230)

bulbs acquired by Radio News for use at its own broadcast station, W8NY, were made by Lloyd P. Goze, a graduate of the University of Illinois, in the laboratories of that institution. They represent an enormous amount of technical experimentation and constructional skill, and are probably the finest devices of their kind in existence today. Some idea of the size of these cells may be obtained from Fig. G, on page 220, and the illustrations on pages 221 and 226.

The radio television demonstration given in June was intended merely to show the feasibility of television transmissions on the regular broadcast band. At the present time, neither Mr. Samini or the officials of WCFL have any definite plans for television broadcasting on regular schedules, but they have stated that they will make plans of this kind in the near future.

Samini is working on a number of ideas which, he claims, will materially improve television transmission without widening the modulation channel of the transmitter. One of these involves a disc having three sets of spirals, each covering an arc equal to 120 degrees. Another deals with the use of a local oscillator, which improves what he calls the “corrected definition” of the transmission. It is too early now to report on the success of these projects, but as the results of the experiments become known, they...

The Listener Speaks

(Continued from page 238)

“In the Gay Rhine,” This, of course, isn’t grand opera, but it serves to illustrate my meaning.

I wonder, Mr. Adams, if you know that all the operas, with the exception of a very few, are composed and written in France? One would hardly expect an Italian, German, Frenchman or any other foreigner to write in any but his native language.

No doubt you’ll say that the various operas could be translated into English. Possibly they could, but not without impairing the original beauty. To my mind, the translation is coarse and harsh, and I believe the great majority will agree to this.

That’s off my chest now; let’s have some more “grand opera.”

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