

# Two-Way Television Communication Inaugurated—Another Important “First” for Amateur Radio

**W**HAT is believed to be the first successful two-way television communication radio circuit ever established between licensed stations in regular operation was formally inaugurated at the New York World's Fair on September 27th, with W2USA in the Communications Building as one terminus and W2DKJ/2 in the New York Daily News Building, eight miles away, as the other. Sight and sound are simultaneous each way, the television channels being on the 112-Mc. band and the voice on 56 Mc. With W2USA's Managing Director, Arthur H. Lynch, W2DKJ, as master of ceremonies, a number of well-known figures in amateur radio participated in the event. These included A.R.R.L. President George W. Bailey, W1KH; Hudson Division Director Kenneth T. Hill, W2AHC; former Hudson Division Directors Dr. L. J. Dunn, W2CLA and Dr. A. L. Walsh, W2BW; A.R.R.L. Research Engineer J. J. Lamb, W1AL; Dr. James M. B. Hard, XE1GE, and the operating staff of W2USA. Also cooperating were W. A. Ready, president of the National Company, and R. S. Burnap, D. Y. Smith, ex-2AYD, and D. A. Richards of RCA Manufacturing Company. In addition to taking part in the television QSO's from the television booth, the gang also joined in the regular Friday night QST over W2USA's five 'phone transmitters operating simultaneously on different bands. Needless to say, the successful demonstration of two-way television communication was the principle topic of the various speakers.

Following the description of the new amateur television system by J. B. Sherman and L. C. Waller, W2BRO in the articles which appeared in the May, June and July issues of *QST*, and after viewing the successful demonstration of this equipment put on by W2BRO during the radio show in Chicago last June, Art Lynch was convinced that television communication should be added to the otherwise completely representative amateur activities at W2USA, "the most visited amateur station in the world." Although time was short, with the Fair closing at the end of October, he was not to be discouraged. An immediate conference with Ed Braddock, W3BAY, manager of the Amateur Division and Doug Smith, ex-2AYD, manager of the Special Tubes Division of RCA Manufacturing Company, and representatives of A.R.R.L. Headquarters, re-

sulted in tentative adoption of a plan. Before its final execution, however, there were a number of trying setbacks. Suitable space for the television shack had to be obtained at the Fair and a suitable site in New York City had to be found where the owner would permit erection of antennas for the other station. Dr. John S. Young, Director of Radio and Television for the New York World's Fair, who has fought many a battle for the W2USA gang, was instrumental in persuading the Fair administration to donate the \$8,750 worth of space which had been selected as most suitable. Clifford B. Denton, an old time friend of amateur radio and Director of Radio for the New York Daily News, arranged for antenna space on the roof and "shack" room on the upper floors of the Daily News Building which is 40 stories high and in the heart of New York City, eight miles from the site of W2USA. A group of manufacturers, including RCA, National, Thordarson, Hallicrafters, Kenyon and Hammarlund, generously aided in provision of the booth and equipment.

The television equipment at each end of the circuit consists of a camera-modulator unit, a receiver and a transmitter for operation on the 112-Mc. band. These units are duplicates of the camera-modulator, receiver and transmitter described in the May, June and July 1940, issues of *QST*. The 56-Mc. voice transmitter is a National Type NTEA unit to which a Kenyon Type 261 transformer has been added for coupling the audio output circuit to the plate circuit of the final 6L6. The voice receiver at W2USA is a National NHU. The other station uses a National 1-10 receiver. Since continuous "duplex" operation is not permitted on the 56-Mc. band, an operating "on-off" switch is provided which controls a multi-pole relay for antenna change-over as well as for switching the B-supply between the transmitter and receiver. Both stations use "pitchfork" antennas of the type shown in Fig. 5C, page 16, January 1939 *QST*, for the 56-Mc. circuit. The frequencies of the two transmitters on this band are 57.2 and 58.6 Mc. Each of the television transmitters, which operate on 112.5 and 115.5 Mc., uses a 3-element close-spaced array. Similar antennas are used for the television receivers.

Lee Waller, W2BRO, who has had plenty of



Upper Left — Operating position in the television booth at W2USA with W2DKJ at the mike and W2HYJ, custodian, behind the camera. Upper Right — Viewed over the television camera focused on a visiting Legionnaire are A.R.R.L. President Bailey (center) with Jim Lamb (left) and Art Lynch (right). Lower Left — High interest is shown by hams and other fair visitors crowding around the television booth. Lower right — Inside the shack at the other end of the circuit with W2HID, custodian of the New York station, focusing the camera. Television receiver in the foreground, transmitter left-rear. (Photos courtesy of W2WD and N. Y. Daily News)

television experience, assisted ably in getting the video portion of the system in operation. The New York end of the television circuit is rather unique, being somewhat in the nature of an upside-down station because the 56-Mc. voice transmitter and its associated apparatus is located two full stories above the video equipment with its transmitting and receiving antennas.

An essential for television transmission is proper lighting. A single thousand-watt bulb in a reflector mounting is used at W2USA and a group of smaller bulbs with built-in reflectors is used at the New York station. In the interest of comfort for the televised, to say nothing of economy, it is desirable to avoid unnecessary operation of the lights. You don't get illumination without heat as well as glare — and a little heat goes a long way. Accordingly, switching is arranged to cut off the light during reception. This lighting control arrangement also gives the folks outside the booth a better view of the received pictures, since the apparent brilliance and contrast of the image are improved with the glare removed.

In the operation of the combined voice and television circuit a number of interesting new features of operating technique have been revealed. For instance, cross-band operation with television one way and voice the other proves to be surprisingly effective, answers to oral questions being given by a shake of the head or other appropriate gesture. A two-way "conversation" by sign language is, of course, entirely feasible using the television channels alone. Mutual interference between the voice and television circuits, and even between the two picture channels, is surprisingly slight. It is also noticeable that the television in particular seems to be much less susceptible to electrical noise interference than would be expected. One peculiarity that has been observed is that radio signal interference which sounds especially bothersome with a voice receiver tuned to the television channel does not affect the received picture on the television receiver in the slightest.

Reactions of the amateurs who have witnessed this television demonstration, as evidenced by

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their unanimously enthusiastic comments, indicate that ham television has a thoroughly practical appeal. Blasé old-timer and veriest beginner both get the same kick out of it.

The W2USA gang have done another fine thing for amateur radio in establishing this television demonstration for the final month of the Fair. Art Lynch and the boys rate high credit for giving the game another historical "first."

— J. J. L.

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