



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

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Attached – Map of Broadband Microwave
Radio Relay Systems

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1

FIRST TL ORDER PLACED

An order for the first TL Radio System has been placed with Western Electric by the Mountain States Company for use in Montana between Billings and Hardin. The new radio facility is required to furnish additional circuits in conjunction with the conversion of the Hardin office from manual to unattended CDO. Hardin is a growing community near the new Yellowtail Dam a few miles from Fort Custer of "Custer's last stand."

Four hops of non-diversity TL microwave will be used to span the 45 miles between terminal points. While TL can handle greater hop lengths, the terrain in this case together with the low cost TL repeaters made the best design a four hop system. Initially 24 ON circuits on this TL will reinforce 24 O carrier circuits on open wire between Billings and Hardin.

Roof top antenna structures will be utilized at the radio terminals and one repeater while 20-foot H type pole structures will be erected at the other two repeater sites. On the first hop out of Billings TL will parallel its big brother TD-2 to Billings Junction on the northern transcontinental microwave route.

This first TL system is taking good advantage of several money saving features that this new facility has to offer. These include lower cost equipment, antenna supports, and standby power along with economical engineering and installation. In addition it should eliminate in most cases the need for costly buildings or even a building at all.

2

HURRICANE DONNA

Early plant damage reports indicate that Hurricane Donna caused three tower failures during her excursion up the East Coast between September 9 and 12. More details concerning Donna's rampage will be included in a later issue of RADIO NOTES.

The first tower came down on September 9 at the Matecumbe Station in the Florida Keys. This 150-foot guyed tower was in an area where winds in excess of 160 MPH were reported. Building and equipment damage was also sustained. This is the first station southwest of

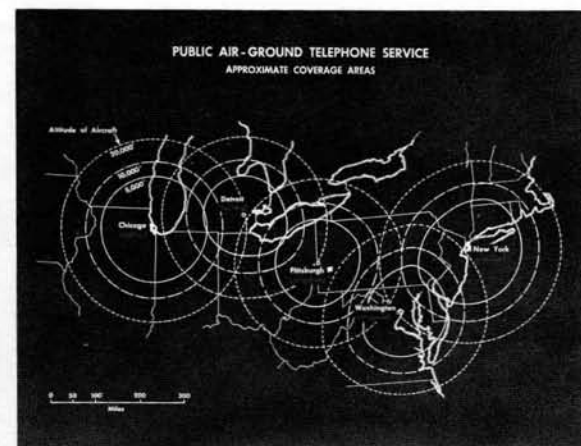
Key Largo on the 5 hop off-the-air television system to Key West. TD-2 microwave is used on this route.

On September 12 two 41-year old, self-supporting towers at Boston's Coastal Harbor Station WOU in Green Harbor, Massachusetts collapsed during the height of the storm. These were two of three 165-foot transmitting towers arranged in a triangle about 300-feet apart. No damage to the building or third tower was sustained, and no personal injuries resulted from the falling towers.

3

AIR-GROUND SERVICE EXPANDS

Public air-ground telephone service was expanded beyond the Chicago-Detroit area on August 15, creating a communications corridor stretching from Chicago to beyond the Atlantic shore. Completion of two-way air-ground telephone facilities in New York, Pittsburgh and Washington, D.C. (RADIO NOTES, March 25, 1960) extends the service throughout aviation's "Golden Triangle," an area which originates about a



third of the nation's air passenger travel and a fourth of all private flights. People in airplanes equipped for the service are now able to call anywhere in the worldwide telephone network while flying within the coverage radius of any of the five cities.

The ground stations for this service are operated and maintained by the New York Telephone Company, the Chesapeake and Potomac Telephone Companies, the Bell Telephone Company of Pennsylvania, Michigan Bell Telephone

Company and Illinois Bell Telephone Company.

Rates for the service depend on the location of the plane and the party that is calling or being called. A three-minute call between an airplane over New York City and a telephone in Yonkers will cost the minimum price of \$1.50. A call between the same plane and an Atlanta phone would cost \$2.65 for the first three minutes. At present, 17 corporate and other types of private aircraft are equipped to use the service.

It is expected that when multi-channel airborne sets become available early next year utilization of the service will increase considerably. Plans are currently under consideration for expanding the service to include major air hubs and routes as future demands may require.

4

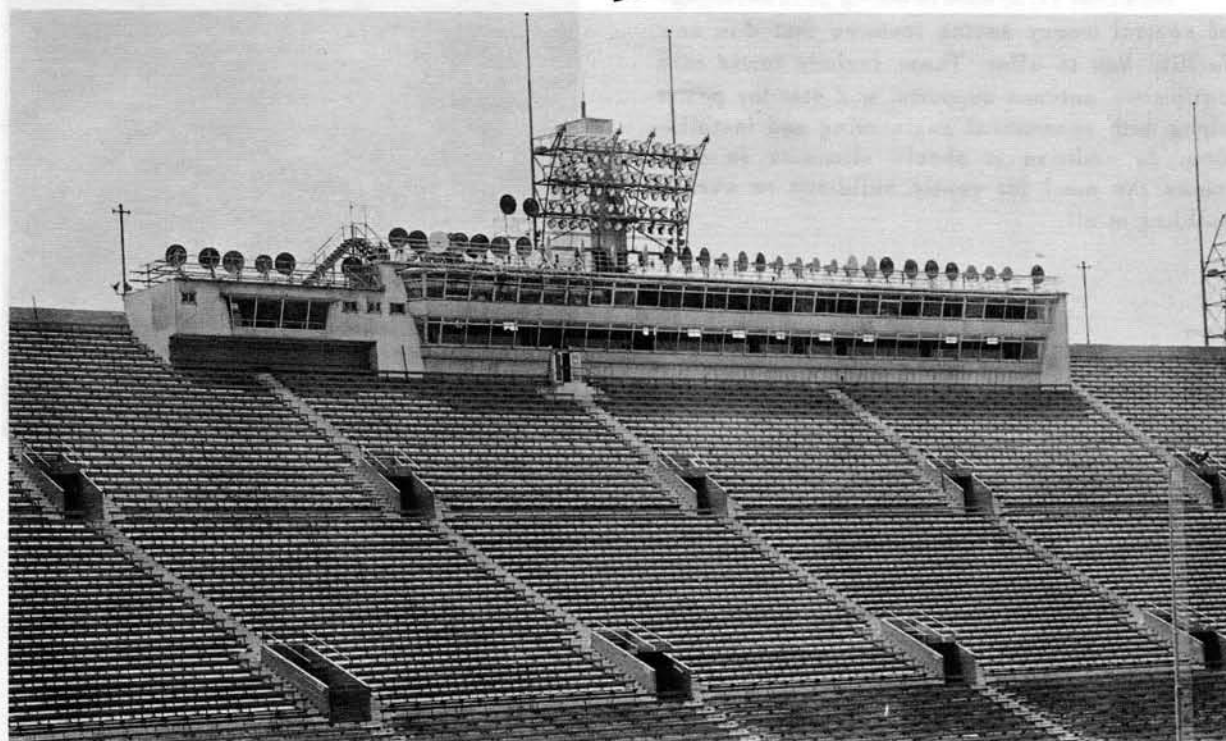
SOUTH CAROLINA EDUCATIONAL TELEVISION SYSTEM

Southern Bell recently received an order from the Educational Television Commission of the state of South Carolina for the provision of facilities to transmit television programs to 12 localities throughout the state. Programs will

be originated at the state capital, Columbia, South Carolina, and will be transmitted over a 1-way network. The backbone portion of this network will use TD-2 microwave facilities along the existing route from Columbia to Charleston via Allendale, a total of 6 hops. Three points off the backbone route will be served over spurs using Collins microwave equipment, the longest spur being 3 hops. Local distribution to the schools in twelve areas will be provided over coaxial cable transmission systems similar to the educational television network at Hagerstown, Maryland.

The order called for a service date of September 1, 1960. To meet this date Southern Bell temporarily utilized TD-2 facilities recently installed on the Columbia-Charleston route for message telephone service. Special arrangements were made with the Western Electric Company to expedite shipment and installation.

The system is only the initial phase of this project, and within 5 years the Educational Television Commission expects their network to extend to every major high school and junior high school in the state. The first addition, for which a new order has just been received, covers an extension along the existing TD-2 route from Columbia to Greenville.



5

MORE ON DEMOCRATIC CONVENTION

The July 28, 1960 issue of RADIO NOTES

provided some interesting statistics regarding the Pacific Company's coverage of the Democratic Convention. We have just received a photograph showing the impressive array of 39

microwave terminals atop the press box at the Los Angeles Memorial Coliseum. These circuits were routed over 2000-feet of balanced video cable to the convention location at the Sports Arena. The other photograph shows an 80-foot tower and microwave units placed at ABC Studios for convention coverage.



The coliseum radio location was arranged for transmission in six different beam paths concentrated within an arc of about 105 degrees. One path had 10 radio channels, two had 8 and the remainder provided a lesser number of channels. A total of 16 transmitters and 23 receivers were operated simultaneously at the Coliseum radio location.

The radio frequency plan used available frequencies under existing licenses in the 4 kmc, 6 kmc, 7 kmc and 12 kmc bands. Twenty microwave receivers in the 6 kmc band were equipped with preselection filters permitting channel assignments on a 25 mc separation basis.

6 MAJOR REARRANGEMENTS AT BOSTON MARITIME STATION WOU

The New England Company for several months has been working on major rearrangements in Coastal Harbor Station WOU at Boston. These changes will convert the station from local Plant Department attendance to complete remote

switchboard operation by the Traffic Department. In addition, other improvements will be made.

The decision to convert the station to unattended operation of the radio facilities was based on a cost study of the relative operating expenses. The New England Company estimates that annual savings of about \$30,000 will be realized as a result of the new operating arrangements.

At the Green Harbor transmitter-receiver site a new building about the size for a 335 Step-by-Step CDO has been erected and will house the radio equipment.

Most of the radio equipment is being reused from the old facilities at Green Harbor. However, a new Aeronautical Communications Equipment Model 446-21 transmitter will replace an old Western Electric 9-C unit. This new 350-watt transmitter will be used primarily on the safety-calling channel 2182 kc. In addition, it will be equipped with crystals for operation on the two public correspondence channels. This will permit using the multi-channel transmitter during outage or maintenance of the regular transmitters. Switching of transmitter frequencies will be under the control of the terminal attendant in Boston.

Another new feature at the Green Harbor radio station is a standby 223-type receiver equipped with two 122-A radio frequency amplifiers. In this way, the receiver becomes a three-frequency equipment which may be switched remotely from the control terminal. It is capable of operating on either of the working channels or the safety-calling channel.

Present plans are for cut-over to unattended operation on December 17, 1960. Meantime, final equipment rearrangements and training of personnel is being completed. Special efforts are being made to insure continued good maritime service during the conversion.

7 TELEPHONE MAINTENANCE SERVICE

Just a reminder that all applications in the Industrial Radio Service (which includes the Telephone Maintenance Service) must be signed by an officer of the Company in accordance with Section 1.503 of the F.C.C. Rules which is under Subpart F covering the Safety and Special Services. This requirement is different from Section 1.442 under Subpart E covering Common Carriers which permits a "Duly authorized

employee" (if applicant is a corporation) to sign applications.

Applications must be accompanied by a frequency coordination letter. (See Section 11.8(a) (3)). Call Miss Livermore, EX 3-2180 for letter.

The FCC, on July 27, 1960, amended Section 11.65 of the Rules to delete the requirement of notifying the Engineer in Charge of each Radio District each time a base station in the Industrial Radio Service is to operate at temporary locations within his district. The new rule requires notification to all District Engineers in area covered by license only at time of issuance of original authorization.

A further change, Section 11.160(c) and (d), eliminates the requirement of keeping records for base stations operated in the Industrial Radio Service at temporary locations.

8

TD-2 MICROWAVE GENERATOR

The TD-2 microwave generator has been a principal cause of hits or momentary interruptions to service on this system. The hits are particularly objectionable when data signals are being carried.

To overcome this difficulty, the Bell Laboratories has redesigned the generator (RADIO NOTES, February 13, 1959). Three major sources of hits have been eliminated by replacing the 2C43 lighthouse tubes with 416B and 418 tubes, by replacing certain by-pass capacitors with a silver button type which is less susceptible to "whisker growing," and by removing a voltage regulator tube.

Immediately after the first redesigned generators were installed in February of this year, fuses in some of the plate power supply leads blew for no apparent reason. By April the problem was serious enough that production of replacement units was stopped; however, a limited number were manufactured to equip new TD-2 bays.

Deburring and ultrasonically cleaning the cavities, adding teflon insulation in a few critical areas, and subjecting the generators to a 1000 volt breakdown test and a 24 hour soak at 750 volts have reduced the number of fuse operations to a level comparable with that occurring in the older model microwave generator.

New generators built with the above refine-

ments have recently been tested in the field, and only 2 hits have been recorded in 5 months of operations. On this basis the generator appears sufficiently improved to warrant full production for the planned replacement program. Western Electric has indicated that the first replacement units should be available for installation by January 1961.

9

MORE ON PROJECT ECHO

It has been reported from England and France that signals from the Bell Laboratories Holmdel station have been received via the Project Echo balloon at radio stations in both countries.

Signals were picked up at a radio site located outside of Paris on August 20. On August 23 the Jodrell Bank Experimental Station in England reported that they received four minutes of speech followed by the song America the Beautiful. The British Post Office station at Malvern also reported receiving unmodulated carrier on three passes of the balloon satellite.

10

REMINDER CONCERNING LICENSES

The present Point-to-Point Microwave and Local Television Transmission Service licenses expire on February 1, 1961. Applications for renewal of these licenses may be filed "not less than 30 days nor more than 60 days prior to the expiration date of the license" - F.C.C. Rule 21.29(f). This means that preparation of the renewal applications should be getting under way. A P.E.L. is being sent to the field to tell about the details.

While speaking of licenses, a further reminder in connection with the use of "blanket" type licenses, such as Rural Radio, Point-to-Point Microwave, etc.; the local F.C.C. and the F.C.C. in Washington should both be advised at least two days prior to the use of these licenses. Also, the period of use is limited to six months. If it looks as though the installation should be permanent, the appropriate applications for construction permit should be filed with the F.C.C. 30 days prior to the end of the six month period. If on the other hand, it looks as though another month or two will fulfill the service requirements of the installation, simply write a letter to the F.C.C. asking for an extension of time.

RADIO INFORMATION

The following have been forwarded since the last issue of RADIO NOTES:

BSPM 729A	-		
BSPM 730	-		
BSPM 730A	-		
BSPM 731	-		
BSPM 731A	-		
BSPM 732	-		
BSPM 732A	-		
BSPM 733	-		
Appendix 1			
AA266.043, Issue 4 - TD Radio - Automatic Switching - Control Equipment - Toll Systems			
Appendix 1			
AA266.080, Issue 1 - TH Radio - Message Connecting Links - Toll Systems			
A301.369, Issue 1 - Power Supply J87203A - Operating Methods			
A220.982, Issue 1 - D2 Alarm and Control Circuit and Order Wire Circuit - Out-of-Service Tests - Toll Systems			
BSPM 734	-		
R00.030, Issue 6 - Alphabetical Index of General Letters and B.S.P.'s in the Radio Series			
BSPM 734A	-		
Alternate Use of Telephone Company Instruments with Private Mobile Radio Systems			
	8-12-60	Operating Vice Presidents	C.C.B.- C.C. Harmon, Engr.
Public Radiotelephone Service to Aircraft - Outline of Plans (File No. 3C2.8)			
	8-19-60	Traffic Mgrs.	C.K.C.- E.S. Randel, Engr.
P.E.L. 6750: P.O.L. 1950: Bell System Practices - Conversion to Plant Series			
	8-26-60	Chief Engrs. & Plant Mgrs.	C.M.M.- J.H.F.- M.F.O.- P.H. Ring, Engr.
Mobile Radio Cost Results Summary			
	9- 8-60	Plant Supvrs.	P.C.S. Jr.- Mrs. A.C. Didie, Engr.

