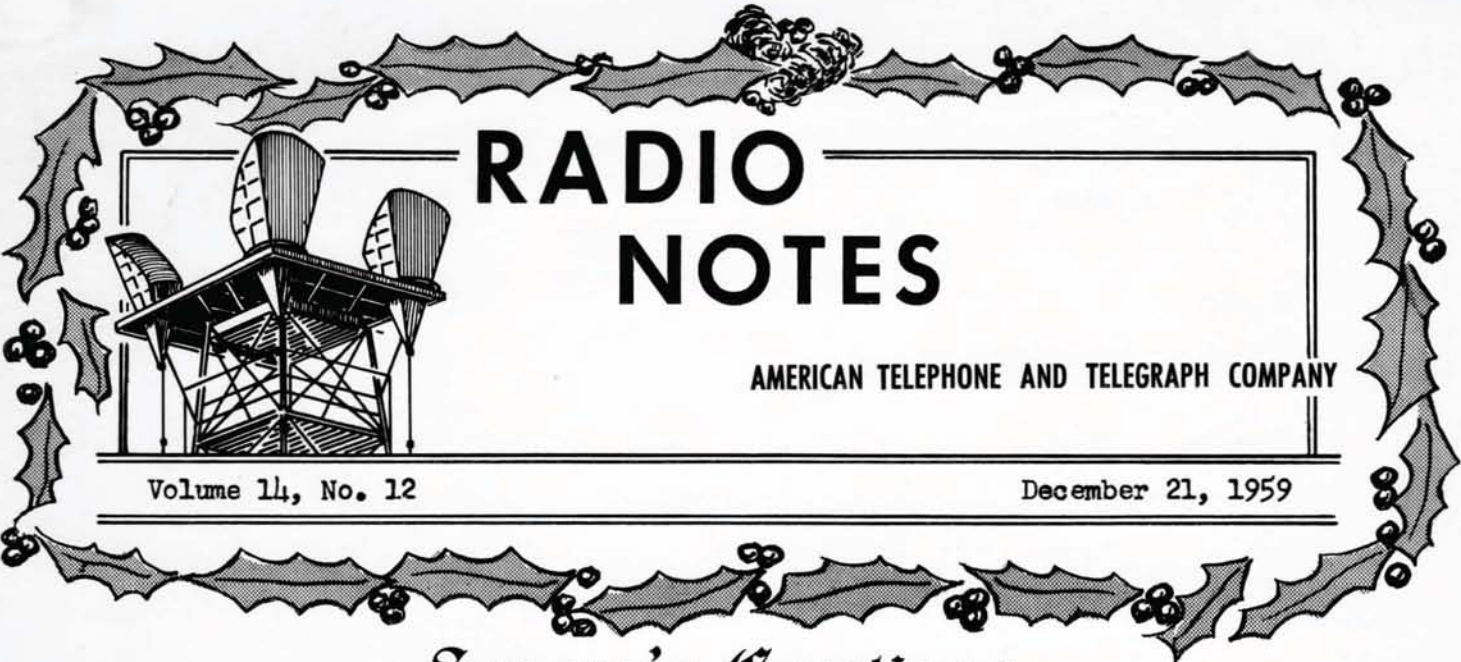




RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

Volume 14, No. 12

December 21, 1959

Season's Greetings

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Attached - Map of Trans-Canada Telephone System
Microwave Network Routes

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1. RADIO NOTES DISTRIBUTION

To insure that RADIO NOTES are sent to the right people in a changing and expanding Bell System organization, our unnumbered letter dated May 27, 1959 (LS20.2-1) asked the Chief Engineers to submit new mailing lists covering all departments in their area. Replies have been received, and the new distribution commenced with our November issue. Please call Miss Saraceno on EXeter 3-3605 concerning any changes you may have.

About 2200 copies of RADIO NOTES are mailed monthly to the Companies. We are pleased to note the continued interest in this publication, and future issues are planned using essentially the same format. Radio items submitted by the Companies have increased the usefulness of these notes considerably.

2. MEASUREMENT OF RADAR POWER DENSITY

The Systems Engineering people at the Bell Laboratories have ordered an Empire Devices Model NF-157 Power Density Meter for tests and study. Delivery interval is expected to be about four months.

This instrument is intended for use in surveying microwave fields in the vicinity of high-power radars and as a personnel safety indicator. Frequency range is continuous from 200 to 10,000 mc.

The Laboratories people plan to use the meter in connection with development, at the request of A.T. & T. Engineering Department, of power density survey techniques. When suitable field measurement procedures have been determined, it is planned to make this information available to the Operating Companies.

3. NEW UHF SYSTEM IN SERVICE

The first Bell System installation of Farinon Electric Company 450 mc broadband radio equipment was completed by the Bell Telephone Company of Nevada on November 3, 1959. This equipment is available in several versions providing up to 150 kc of baseband. The Atomic Energy Commission was furnished service in less than three weeks from the time an order was placed on the equipment supplier. Farinon Electric Company agreed to supply channelized radio equipment for the one-hop system as a package using eight channels of Lenkurt 45CA carrier.

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This installation is somewhat unusual in that the radio, carrier terminals and associated dial long line units were installed in 5 foot diameter steel pipe towers 49 feet high, with interior circular stairway and an equipment platform at the 41 foot level. The radio path is about 6 db below free space and 21.5 miles in length. Andrew type 3606 corner reflector antennas were used.

The services provided were six off-premise dial PBX stations and one teletype channel. A second teletype circuit is on order. Six channels were compandored for the station lines. Two channels were supplied without compandors, one to be used for telegraph and one spare. The over-all circuit for the PBX stations includes 23 miles of 19H88 cable between the PBX and the radio system.

Although it has not been practical to make detailed system tests, the noise on the carrier channels appeared very low and the speech quality was good. In spite of widely varying AC voltage and poor wave form, no failures have occurred in either the radio or carrier equipment. Perhaps the greatest difficulty encountered was with test equipment, which was fussy about its power source.

4. NEW VHF VEHICULAR SET

Two preproduction 150 mc vehicular mobile telephone sets have been loaned to Illinois Bell by the A.C. Spark Plug Company. Experience gained with these sets will be used to advantage in the development of later models. Some 50 sets will be available for Bell System trial in early 1960. These units will be considered production models.

The new set is coded VRT-1. It has the advantage of size, weight, lower battery drain, ease of installation and, it is hoped, reduced maintenance. Cost of the set when manufactured in large quantities should be lower. The set is complete with selector and control unit. (See photograph) It can be equipped for one to four frequency pairs with push-button channel selection.



More information will be forthcoming as soon as experience with the field trial sets permits.

5. HOSPITAL CLOSED CIRCUIT NETWORK

The Washington, D.C. Area of the Chesapeake and Potomac Telephone Company has nearly completed work on a microwave closed circuit color television network linking the various military hospitals located in and around the Washington Area. The network is arranged so that medical procedures or lectures originating from either Bethesda Naval Hospital or Walter Reed Hospital may be sent to the outlying hospitals located at Fort Meade, Camp Detrick, Andrews Air Force Base and Fort Belvoir.

The microwave system consists of four one-way circuits transmitting from Walter Reed to the Outlying hospitals and one two-way circuit between Walter Reed and Bethesda. All channels are equipped with diplexers to permit simultaneous transmission of the audio together with the video signals. A total of eight microwave links are required and make use of Raytheon and Motorola fixed microwave equipments.

6. OPERATION GARBAGE CAN

In connection with 11 and 17 kmc propagation studies the Laboratories have recently completed rain attenuation tests in an area of high rain expectancy near Mobile, Alabama. Sixteen rain gauges used to measure rainfall along the test path have been returned to Murray Hill for final disposition.

In recent months several Companies have requested information concerning the construction of rain gauges to measure rainfall in specific areas where rain data is either nonexistent or where rain data is in question. To care for these cases the Laboratories have agreed to ship their surplus gauges where needed to the extent of the limited supply.

The photograph shows one such gauge. Although the external appearance may seem rather crude, the entire mechanism reflects considerable experience in gathering reliable rain data. A five-gallon galvanized can (11½" diameter and 12" high) with a 12" funnel mounted through the cover comprise the housing and catch area for the gauge. A tipping "bucket" mechanism within the housing is adjusted to tip for each .01 inch of rainfall. When a tip occurs, a magnet mounted on the side of the tipping bucket passes a switch closing the contacts momentarily. The switch circuit may be connected to an external recorder to show



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the pulses (representing .01 inch rainfall) relative to the time axis on the recorder paper. The recorder and connecting equipment are not furnished by the Laboratories.

Requests for these gauges should be directed to Jack Crawford, EXeter 3-3315. Shipping costs will be borne by the receiver.

7. JOB FOR A GREASE MONKEY?

Did you ever stop to think what a ticklish job it would be to replace the top set of guys on a microwave tower? To begin with, it takes a rigger with a lot of nerve to climb out on the end of a torque arm - say 300 ft. in the air. For good measure, it's no mean stunt to detach the old guy, attach the new one and bring it up to the required tension - without having the tower twist more than 1/2 degree - or you disrupt transmission.

Why worry about this now? After all galvanized strand ought to be good for 20 years or so. Unfortunately there are towers that have been in service only 5 years and the guys are now starting to show signs of rust.

Fortunately, it looks as though rust can be stopped by the application of a grease type of material known as "No-ox-id." We aren't sure how long a coating of this goo will remain effective although the manufacturer says he has seen it last 15 years! Being a bunch of doubting Thomases, we have asked the Labs for an evaluation of the stuff.

Also, there is the not so small problem of how you apply this gunk to a guy strand inclined at an angle and rising 300 feet in the air. Maybe a "B Grease Monkey?" We'll let you know when we've gotten some of the answers. In the meantime, it looks as though it may have enough promise at least to try on exposed threaded parts where a greasy film would not be objectionable.

8. MICROWAVE INTERFERENCE CASES

Within the past year Construction Permit applications have reached the F.C.C. posing possible microwave interference from non-Bell carriers. Two such cases in Wyoming involving the Shirley Basin Transmission Company are currently being investigated by Long Lines and the Mountain States Company. This company is set up as a common carrier serving community antenna systems from off-the-air pickup locations using frequencies in the 6 kmc common carrier band.

In one of these cases four off-the-air TV channels received from Salt Lake City at a place called Medicine Butte are to be transmitted over a one hop 84 mile microwave system to White Mountain. At this point the video signals are retransmitted by a double feed arrangement to the customer at Green River and nearby Rock Springs. This system will parallel the Denver-Salt Lake TH system now being installed by Long Lines and could present a serious interference problem.

The other case involves both the Long Lines and Mountain States people. Here the Shirley Company plans to transmit three Denver off-the-air pickup channels from a high point called Crow Creek Hill to Casper. There is possible interference to Long Lines TH in the Crow Creek area and a possible interference case with an existing Mountain States system at Casper. Furthermore, the Shirley Company facilities would duplicate existing Bell facilities, over a more circuitous route, which have been providing adequate service for several years.

Both of these cases are being studied. They point up the problems which are appearing more frequently as microwave usage increases.

9. TD-2 TEN FOOT PARABOLIC ANTENNAS

Reports of low gain of TD-2 KS-15838 10 foot parabolic antennas have been verified by the manufacturer. Measurements indicate the gain to be down about 0.5 db at 3700 mc and 1 to 1.5 db at 4200 mc even when using "hop stretcher" feeds. The feed used with the 10 foot antenna was designed for the 8 foot antenna and does not illuminate the 10 foot dish properly.

The remedy suggested by the manufacturer is to redesign the antenna, increasing its focal length to illuminate the dish more efficiently. Tests are being made of a new design using the "hop stretcher" type of feed in a 48 inch focal length parabolic reflector. Preliminary results look favorable. Assuming this design meets the specifications and is accepted, deliveries are expected to start about the middle of January 1960, on current and held orders.

TJ 10 foot antennas are NOT involved in this trouble.

10. "GRANDFATHER CLAUSE" FOR MODULATION FILTERS

The F.C.C. has recently issued an Order effective immediately which amends Part 21 of its Rules to exempt transmitters in the Domestic Public Land Mobile and Rural Radio Services installed prior to November 1, 1958 from the modulation filter requirement. The "grandfather clause" applies to all such wideband transmitters until November 1, 1963 at which time all transmitters in these services are required to convert to narrow band operation.

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The question was brought out several months ago in discussions with the F.C.C. staff regarding the requirement that all transmitters in the Domestic Public Radio Services be type accepted by January 1, 1960. The staff agreed at that time that the filters are not essential to satisfactory operation of wideband transmitters, and the above Order is a result of this agreement.

11. BROADBAND MICROWAVE MAP

The "Broadband Microwave Radio Relay Systems" map will be issued on a bimonthly basis commencing with the December issue. A copy of this map is also normally attached to the April issue of RADIO NOTES each year.

The practice of issuing this map on a monthly basis was discontinued because of the decreasing number of radio route changes over this small interval of time. Although the growth of microwave is continuing at a rapid pace, the bulk goes into "fill" on existing routes which is not depicted on the map.

12. ORGANIZATION CHANGE

Mr. G. M. Smith (Gale) has accepted a transfer from the Point-to-Point Radio Group to the Suggestions Studies Group in the Customer Telephone Products Planning Section here at "195". The transfer was effective December 14, 1959. Good luck Gale!

13. RADIO INFORMATION

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

BSPM 692A -

BSPM 693 -

BSPM 693A -

BSPM 694 R71.130, Issue 1 - Electron Tube Test Set - Model
E40.563, KS-15874-L1 Cardmatic Tube Tester
A702.643,

R40.164.00, Issue 1 - KS-5759 Delay Lens Antenna (Maintenance
Methods) - General

R40.164.10, Issue 1 - - Replacement of Weather Cover
and Antenna Lens

R40.164.20, Issue 1 - - Rehabilitating Lens Elements

BSPM 694A -

BSPM 695 AA290.014, Issue 1 - Type EC and ED Emergency Radio
Terminals - VHF Emergency Radio
Telephone - Radio Systems

BSPM 695A -

P.E.M. 7105 Mobile Telephone Service - Modified Fastening of S.E.I.
1315-J Junction Box to Base Plate (1S3.6-77)

Correction Letter to Chief Engineers

11-20-59 TD-2 Microwave System - IF Amplitude Equalization for
Television Circuits

Unnumbered Letter to Traffic Managers

11-16-59 Mobile Telephone Service - Accepting Calls to and from
Dial Mobile Units

Unnumbered Letter - Marketing Department List

11-16-59 Bellboy Personal Signaling Service - Marketing Program
Materials - Ordering Information (1S3.9M-8)

Unnumbered Letter to Commercial Managers

11-16-59 Dial Mobile Telephone Service in Independent Companies

TRANS-CANADA TELEPHONE SYSTEM MICROWAVE NETWORK ROUTES

REVISED SEPTEMBER 30, 1959

