

# RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY OPERATION AND ENGINEERING DEPARTMENT

Volume 14, No. 5

May 18, 1959

- 1. TD-2 Aids Cable Restoration
- 2. International "Sidewalk Superintendent" Service
- 3. Committee on Radiation Hazards
- 4. 25-890 MC FCC Hearings
- 5. Nuts, Bolts, Washers What Next?
- 6. Mobile Service Discontinued on Three Trains
- 7. Mountain States Radio Growth
- 8. Radar Interference Case
- 9. Triodes Similar to 416B Now on Market
- 10. For Sale Items Discontinued
- 11. A Periscope Antenna Trouble Case
- 12. FCC Lifts CATV Freeze
- 13. FCC Reports on TV Allocations to Congress
- 14. TJ Survives Severe Snow Storm
- 15. Great Lakes Hearing Oral Argument
- 16. Comparator Kits Available
- 17. Mobile Service Areas and Channels
- 18. Organization Change
- 19. Radio Information

Attached - Map of Public Class II B Coast Stations

#### 1. TD-2 AIDS CABLE RESTORATION

Fifteen minutes before noon on April 21, a bulldozer excavating for a new garage 10 miles east of Ligonier, Pennsylvania dug up 15 feet of a Philadelphia to Pittsburgh L3 coaxial cable. By noon the first master group of 600 circuits was rerouted over TD-2 radio according to prearranged restoration plans. "NC Heavy Traffic" announcements were used on circuit groups terminating at several nearby switching machines to control the offered traffic. At 1:05 p.m. a second master group was rerouted via TD-2. Other master groups also were made good at 1:27 p.m., 1:42 p.m. and 1:50 p.m. through the effective use of diversified facilities. At 2:49, all service was restored and by 3:35 p.m. all service was returned to the cable after the gap had been bridged by coaxial patch cords. With service restored to the cable, protection facilities were returned to their normal assignments.

On April 6 a well digging crew caused another L3 cable failure 5 miles east of Phoenix, Arizona. This cable break occurred at 3:20 p.m., and at 3:45 p.m. a 600 circuit master group was made good on TD-2 via Albuquerque. All coaxials were restored by 7:25 p.m.

## 2. INTERNATIONAL "SIDEWALK SUPERINTENDENT" SERVICE

On April 1 service was started on the first of three closed circuit video systems for the New York State Power Authority at their new Niagara hydroelectric power project. These circuits will terminate at a Visitors Building exhibit to enable the public to remotely view on 24 inch television monitors construction at the following inaccessible locations:

- 1. Niagara Generating Plant
- 2. Tuscarora Pump Station
- 3. Covered conduit site

All three systems will use RCA TVM-1A microwave equipment operating in the 6 kmc common carrier band.

This service is provided by the New York Telephone Company with the exception of the transmitter for the system recently placed in service which is operated and maintained by the Bell Telephone Company of Canada for viewing construction of the generating plant from across the Niagara Gorge. There are two cameras at this site; one for wide angle viewing and the second equipped with automatic pan and tilt for close-up viewing. This system is unique in that the 4 foot parabolic transmitting antenna is located 347 feet from the 150 foot tower base which supports a  $6 \ge 8$  plane reflector. At the receiver site the received signal is reflected from another  $6 \ge 8$  plane reflector mounted on a 147 foot tower to a 4 foot parabolic antenna 140 feet from the tower base.

The second system is currently being installed between the Tuscarora Pump Station on the reservoir and the Visitors Building. Since the Power Authority has indicated this transmitter site will be changed on occasion, the transmitting equipment is installed on scaffolding. To facilitate rapid changes in receiving requirements, it was decided to connect the receiver to its antenna via 300 feet of Stryoflex cable with coax-towaveguide transducers at both ends. The calculated losses and video signal quality were verified by field trial prior to final installation. The third circuit between the covered conduits and Visitors Building is being constructed in a similar manner.

## 3. COMMITTEE ON RADIATION HAZARDS

A meeting of interested government and industry organizations was held in New York on May 4, 1959 under the direction of the American Standards Association (ASA) to consider the preparation of standards in the field of Radio Frequency Electromagnetic Hazards. Among those present were representatives of the Navy, Air Force, A.I.E.E., IRE, EIA, NEMA, FCC, Department of Labor, U. S. Public Health Service, A.F.L.-C.I.O., Bureau of Standards, National Safety Council and the Telephone Group. (The Telephone Group is an organization of Independent and Bell Telephone Companies which participates in the work of the ASA as well as certain government groups such as the RTCM.)

It was agreed at this meeting that the ASA be requested to set up a new Sectional Committee to work on this project. This Committee will be jointly sponsored by the A.I.E.E. and the U. S. Navy Bureau of Ships. Membership will be selected from the various organizations supporting the work of the ASA.

The scope of the work will be left to the determination of the Committee itself. Among the matters referred to at the meeting were the need for considering safe limits of field intensity to avoid serious biological affects, industrial and military hazards and methods of measuring electromagnetic radiation.

# 4. 25-890 MC FCC HEARINGS

Oral phase of the FCC hearing concerning allocation of frequencies to non-governmental services in the radio spectrum between 25 mc and 890 mc (Docket 11997) will commence in Washington, D.C. on May 25, 1959. (See RADIO NOTES March 19, 1959.) A.T.& T. Company witnesses are scheduled to appear on the first day.

- 2 -

## 5. NUTS, BOLTS, WASHERS - WHAT NEXT?

While checking return loss of horn-reflector antennas by the ripple method at the Goulds repeater of the Miami-Florida City TD-2 system (part of the Florida-Cuba radio system), Long Lines personnel discovered that one antenna had a 4 db peak-to-peak ripple instead of the specified 1/10 db or less. The impedance irregularity located 36 ft. out. When the waveguide run was opened at this point, THREE bags of bolts fell out. Presumably they had been inside since the waveguide was installed. The system has been in service since September 12, 1957 (RADIO NOTES September 23, 1957). This is the latest of a considerable number of instances reported over the past 2 or 3 years in which excessive return loss or delay distortion was found to have been caused by bags of bolts in the waveguide. It is the first reported case, however, in which more than one bag was found in a single waveguide run.

New York Telephone Company personnel recently opened the waveguide in their Hempstead station while investigating a small impedance irregularity. An envelope of metal washers was discovered in the section adjacent to the transmitter-receiver bay.

The source of nuts, bolts and washers are a mystery. According to Western Electric, no hardware is packed with rectangular waveguide.

#### 6. MOBILE SERVICE DISCONTINUED ON THREE TRAINS

The Pennsylvania Railroad has discontinued mobile telephone service for passenger use on the Patriot, operating between Boston and Washington and on the Keystone-Arlington operating between New York and Washington. The discontinuance of mobile service is part of the railroad's retrenchment program.

The Chicago, Rock Island and Pacific Railroad has discontinued mobile service on the Jet, operating between Chicago and Peoria, Illinois for economy reasons.

This reduces the trains having mobile telephone service to two, with a total of four railroad cars equipped. These are the Congressional (New York-Washington) and the Broadway Limited (New York-Chicago) of the Pennsylvania Railroad.

Printed in U.S.A.

TCI Library- http://www.telephonecollectors.info/

#### 7. MOUNTAIN STATES RADIO GROWTH

The short haul microwave summary in the January 19 issue of RADIO NOTES showed that the Mountain States Company is fast becoming one of the large users of microwave in their toll plant. Bar graphs clearly show the impact of microwave growth in this company where the toll business currently accounts for more than 40 per cent of their operating revenues.

To effectively care for this large growth in radio facilities, Mountain States management has placed considerable emphasis on training engineers by conducting both general and special courses in radio communications.





## 8. RADAR INTERFERENCE CASE

Air Force radar interference was found to contribute an additional 15-20 db of noise into the voice circuits on the Northwestern Company 6000 mc microwave system at Finley, North Dakota. This interference was first noted immediately following replacement of the old Motorola FM multiplex terminal, which had been in service for several years at the radar site, with new Lenkurt 45BX carrier equipment. The carrier and radio terminals were located in an unshielded Air Force building about 700 feet from the radars. It was determined that both search and height finder radars were contributing noise at their pulse repetition rates into the voice circuits via the new carrier terminal. No evidence was found of interference to the radio system. Since shielding of the carrier equipment was only partially successful in eliminating this interference, it was decided to shield the walls and ceiling of the building with copper window screen. This action eliminated the radar induced noise without costly shielding of the floor area.

At a later date, interference was again reported from a new height finder radar located about 500 feet from the same but now shielded building. This interference was apparently caused by a malfunctioning radar, and no interference has been detected since its repair.

## 9. TRIODES SIMILAR TO 416B NOW ON MARKET

According to an article in "Electronics News" of February 23, the Allen B. DuMont Laboratories are now producing type 6280 planar triodes. These tubes are similar to the Western Electric 416B tubes used in TD-2 microwave systems. Western Electric has been supplying the military with 6280 tubes for some time. Because of the large demand the government wished to have an alternate supplier and requested the industry to submit bids. DuMont was the low bidder.

At the present time the Companies are paying about \$31.50 for \$16B tubes, while Western Electric made 6280 tubes can be obtained for about \$38.60. The Western Electric 6280 is intended for lower frequency operation than the \$16B and has to meet more stringent requirements for low noise. In the \$16B, emphasis is on high-level operation; consequently, the tubes should not be considered as directly interchangeable. There does not appear to be any advantage, such as longer life, to encourage the use of this tube in TD-2 as a replacement for the \$16B. Detailed information on performance of the DuMont 6280 is not available, and it may differ appreciably from the Western Electric version.

Western Electric has licensed a number of manufacturers to produce tubes similar to the 416B. In view of the increased military demand for tubes of this type, articles and advertisements concerning their availability or use may be encountered more frequently in the future.

## 10. FOR SALE ITEMS DISCONTINUED

Occasionally we have been requested by the Companies to publish in RADIO NOTES surplus radio equipment items for sale. The number of these requests has been small, and we have been glad to comply with them; however, we believe the practice should be discontinued in favor of the Central Record Plan established for this purpose.

The Western Electric has administered the Central Record Plan since 1942 to provide a centralized medium for economical disposal of serviceable surplus Telephone Company material. More than a million dollars of sales per year is transacted via this Plan. Details of the Central Record Plan are covered in P.O.L. 1428 dated March 31, 1954.

#### 11. A PERISCOPE ANTENNA TROUBLE CASE

During antenna orientation on the Aberdeen-Pierre, South Dakota TD-2 system it was determined that two of the five hops were 2 to 4 db longer than calculated. Periscope antenna systems are used on this route, and at two repeater stations in the troubled sections one of the two 10 foot parabolic antennas at each location were mounted so that the outer rim was only 18 inches from the main tower structure. It was suspected locally that the deficiency in signal was in some manner due to the proximity of the tower. Moving the antenna to a point where its rim is 10 feet from the tower structure resulted in about 2 db improvement for each case. The exact improvement appeared to be frequency sensitive. The towers are single guyed type 270 and 350 feet high. This is the first reported case where such a trouble was attributed to "proximity."

## 12. FCC LIFTS CATV FREEZE

The normal processing of common carrier applications for microwave facilities to serve community antenna television systems has now been resumed as a result of a recent Report and Order by the FCC.

In May 1958, the FCC put a freeze on such applications and issued a Notice of Inquiry inviting data and views concerning the impact of community antenna systems, TV translators, TV "satellite" stations and TV repeaters on the development of television broadcasting. Among the issues, one was of particular importance to the telephone companies and read as follows:

"Would it constitute a legally valid exercise of FCC's regulatory jurisdiction over common carriers to deny authorization for common carrier microwave, wire or cable transmission of TV programs to CATV systems on the ground of adverse competitive impact on the construction or successful operation of local or nearby television stations?"

In freezing these applications, the FCC stated that it had been urged to refuse to authorize common carrier microwave relay systems to bring programs to CATV systems in communities and areas served by local television stations. The Commission pointed out, however, that this would constitute indirect regulation and control of CATV systems over which the law has provided no direct jurisdiction.

The Bell System comments expressed agreement with the objections stated by the FCC and pointed out that it is the fundamental and traditional obligation of communication common carriers to furnish service within the scope of their offerings and capacity on a uniform basis and without unjust or unreasonable discrimination to all who request it. The recent FCC Report and Order concluded that it would not consititue a legally valid exercise of regulatory jurisdiction over common carriers to deny authorization for common carrier microwave wire or cable transmission of TV programs to community antenna television systems on the ground that such facilities will abet the creation of adverse competitive impact by community antenna television systems on the construction or successful operation of local or nearby TV broadcast stations. With this action, applications filed by the Mountain States Telephone Company for microwave facilities which had been caught in the freeze have now been granted.

#### 13. FCC REPORTS ON TV ALLOCATIONS TO CONGRESS

The FCC recently filed a report with the Congressional Committee on Interstate and Foreign Commerce covering its study of future television frequency allocations. Results on the Television Allocations Study Organization (TASO) on the technical aspects of present and potential VHF and UHF television services is also included in this report.

The 68 page report stated that substantial agreement had been reached on two general conclusions:

- 1. No rearrangement of the present 12 VHF channels can provide for a nationwide, competitive television system, adequate for the reasonable needs of our gorwing population and expanding economy.
- 2. It is convinced that "deintermixture" the assignment of VHF only facilities to some communities, and UHF only to others cannot provide a long-term answer to the allocations dilemma.

The following alternative plans were suggested:

- 1. A 50-channel VHF system, retaining present 12 VHF channels.
- 2. Contiguous 50-channel VHF system, retaining present VHF channels 7-13 and withdrawing channels 2-6.
- 3. Contiguous 25-channel VHF system, retaining channels 7-13.
- 4. Present 82-channel VHF-UHF system.
- 5. 70-channel all UHF system.

#### Summary

- 1. FCC prefers an expanded VHF television system.
- 2. Expanded VHF system of 50 channels would satisfy public interest criteria.
- 3. Must consider realistically the possibility of obtaining less than 50 channels. 25-channel VHF system is minimal.

- 4. To obtain additional VHF and contiguous UHF channels requires an exchange of spectrum space with government and non-government which might involve a long transitional period of 10 years or more.
- 5. Present 82-channel VHF-UHF system or 70-channel all UHF system have certain disadvantages such as, propagation of the higher frequencies in this range, the inefficiency of present-day UHF antenna and transmission lines in these frequencies, and so forth. One distinct advantage, however, is present availability of spectrum space which obviates the need for a costly and complex conversion of government communications.
  - Conclusions of hearing on 25-890 mc, Docket 11997. Conclusions may influence division of frequency space between television and other services.

## 14. TJ SURVIVES SEVERE SNOW STORM

The following is an excerpt from a Mountain States letter which we have received concerning performance of the Phoenix-Flagstaff TJ radio system during a snow storm which occurred February 9, 1959:

"Good radio transmission through the 1959 winter weather season in Arizona has given us all reason to be very proud. We are all especially pleased with uninterrupted service over the new Flagstaff-Phoenix TJ radio system during severe ice and snow conditions. As discussed on April 12, 1959 we have gathered as much information as possible concerning the outage on wire line carrier systems due to heavy snow and ice in the Flagstaff-Prescott and Flagstaff-Winslow sections. In each section an outage of 4 to 6 days was experienced with wire carrier while service to Flagstaff from Phoenix continued on a normal basis over the new TJ radio system with no apparent serious fading as a result of the heavy snow. Article in Phoenix Gazette newspaper stated that the only telephone service to Flagstaff was over the new TJ radio system after the snow storm."

The question has been asked many times as to what happens to 11,000 mc propagation during heavy snow storms. Although no recordings are available from the Arizona system during the February 9 storm the fact that service was not affected is significant. As reported in the RADIO NOTES December 15, 1958 one hop of this 5 hop system is 48 miles long. A later incident, for which recordings are available, indicates that very heavy snow mixed with rain over the 48 mile path caused a fade which reached 30 db for about a 5 minute period. Service was not affected since this path has a 40 db fading margin.

#### 15. GREAT LAKES HEARING ORAL ARGUMENT

On April 11, 1959, five commissioners of the FCC heard oral argument on the examiners decision of July 1957 recommending denial of the applications of three Bell System Companies for nine VHF maritime public coast stations along the Great Lakes. In this renewal of activity in the Great Lakes hearing (RADIO NOTES March 19, 1959) the primary question laid before the Commission appears to be whether radiotelephone service for ships on the Great Lakes should be regarded as an extension of the regular public telephone service or as solely marine communications for shipping industry operational and safety calls. This case and the status of the 1952 applications filed by the Michigan, Ohio, and Wisconsin Bell Telephone Companies has now reached its final stage in the proceedings - that is a decision by the commissioners themselves.

## 16. COMPARATOR KITS AVAILABLE

About the first quarter of 1958 Motorola commenced production of a new MU285A comparator for use in their MR-10 and MR-20 frequency diversity microwave systems. The new comparator switch reduced the switching time interval from about 10 milliseconds to slightly less than 500 microseconds. At that time we were informed that the older MU285 and MU161 comparators could not be modified to include the faster switch.

Because of the increased demand for a faster switch to meet the requirements for other than telephone services, the manufacturer now advises that modification kits are available for equipping all older model comparators with the new switch. The cost is estimated to be about \$25 per kit. These kits will be of interest to those planning to add SAGE data circuits on existing Motorola systems.

## 17. MOBILE SERVICE AREAS AND CHANNELS

New channels have been placed in service as follows:

Location	Channel	Date	
Pensacola, Fla.	JS	Feb. 21, 1959	
San Diego, Cal.	JR	Jan. 14, 1959	
San Diego, Cal.	JS	Feb. 25, 1959	
Chegenne, Wyo.	JR	Nov. 28, 1959	
Casper, Wyo.	JP	Aug. 10, 1958	
Providence, R. I.	JL changed to YR		

The JS channel is in service at La Junta, Colorado instead of YJ as reported in the February 1959 RADIO NOTES.

## 18. ORGANIZATION CHANGE

Rosita Bilotti has joined the Point-to-Point Radio Engineer's group replacing Margaret Tancredi who commenced a leave of absence on April 27.

19. RADIO INFORMATION

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

BSPM 663A	a Seil Televita		
BSPM 664	R00.010,	Issue 11 -	Numerical Index and Checking List
	AA266.022,	Issue 4 -	Vogad and Bypass Panels - Radio Telephone - Toll Systems
BSPM 664A	it <del>e</del> street		
BSPM 665	- autors stat.		
BSPM 666	R70.920,	Issue 1 -	DuMont Type 21-1CBA Coaxial RF Attenuator (General)
BSPM 666A	ri-het a set		
BSPM 667	AA291.005,	Issue 3 -	LD-T2 Radio Transmitter - Radio Systems
BSPM 667A	-		
BSPM 668	A301.373,	Issue 1 -	J86474 DC Power Supply - 2800 Volts, 30 MA 1200 Volts, 100 MA - Including the J86283A DC Power Supply Control Unit - J86283B Rectifier (Unregulated) - J86283C Rectifier (Regulated) TH Radio
	R90.334.00,	Issue 1 -	TJ Radio System - General
	AA266.028,	Issue 4 -	Radio and Express Radio Order Circuit Equipment for use with TD Microwave Radio System - Toll Systems
	AA266.039,	Issue 2 -	TD Radio - Transmitter-Receiver - Test Set - Toll Systems
To besided obey	AA266.075,	Issue 1 -	Alarm Equipment for use with TH Radio Systems - Distribution Fuse, Individual, Audible, and Visual Alarms - Toll Systems

BSPM 668A

P.E.L. 6449	VHF Radio Facilities - Army Air Defense Command (183.9E-4)
P.E.L. 6453	Renewal of Domestic Public Land Mobile Service Station Licences (154.1-207)
P.E.L. 6455	Mobile Telephone Service - Surplus Stock of Western Electric Company 540-A Radio Transmitters (183.1-93)
P.E.L. 6456	Maritime Mobile Telephone Service - Current Availability Status of General Electric 5-Channel VHF Maritime Mobile Sets and A-C Power Supply Panels (153.90-9)
P.E.M. 6888	TD-2 Radio System Alarms - Reassignment of Dehydrator Alarm Leads (183.6-70)
P.E.M. 6894	Change in Nomenclature from Varistor to Semiconductor Diode (153.0-43)
P.E.M. 6915	Mobile Telephone Service 47A/E Control Unit (183.6-69)
P.E.M. 6922	Mobile Telephone Service - Removal of SEI-1315 Selector from Junction Box (183.6-73)

Unnumbered Letter to Chief Engineers

5-8-59 Personal Signaling Service - Expansion to Other Cities (1S3.9M-3)



TCI Library- http://www.telephonecollectors.info/