



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

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(Editor - Room 1710 - Telephone: EX 3-3926)

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Attached - Pictures of Repeater Station Damage

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EXPLOSIONS DESTROY REPEATER STATIONS

Early Sunday morning, May 28th, the TD-2 repeater stations at Cedar Mountain, Utah and Wendover, Nevada and the K carrier repeater station at Knolls, Utah were blown up and virtually destroyed, severing both the central transcontinental microwave and K carrier routes. Cedar Mountain is the second and Wendover the fourth TD-2 repeater station west of Salt Lake City. More than 2200 telephone and telegraph circuits and two television channels were interrupted.

Many private line circuits were made good within a short time and the first TD-2 systems were rerouted around the damaged section by way of Los Angeles within two hours. By Sunday evening, most of the circuits had been rerouted using spare facilities and protection radio channels. One two-way TD-2 channel was made available between Salt Lake City Junction and Los Angeles (via Turquoise) Tuesday night, May 30th, by expediting installation of new equipment on which work was nearing completion. This released some protection channels that had been used for reroutes.

Portable TE equipment was brought in to restore service across the breaks. By June 2nd, four two-way TE repeaters had been set up at each of the microwave locations to restore two message, one television, and one protection channel. Portable scaffolding type towers were used to support the temporary antennas.

Within one week after the blasts, temporary wooden buildings were constructed and six two-way AC-operated TD-2 repeaters were installed at each station to maintain normal service until permanent repairs can be made. The temporary towers with parabolic antennas will be used until permanent towers and antennas can be replaced. Permanent restoration of the TD-2 stations is expected to be completed by July 18.

According to recent news reports, the FBI believes the sabotage was the work of two men who stated their intention was to destroy cartels, such as the American Telephone and Telegraph Company, and to focus attention on an organization called "American Republican Army" which advocates political overthrow of the United States.

Pictures are attached showing the destruction at the Wendover and Cedar Mountain stations.

REFLECTOR TROUBLES

RADIO NOTES of October 19, 1959 contained an item discussing the importance of antenna orientation on the performance of microwave systems. Suggestions were given to assist the field, particularly in the orientation of periscope systems.

Since the appearance of that item, two additional instances of difficulties with periscope antennas have come to our attention and some discussion of these cases may help in avoiding similar troubles in the future.

In both instances the difficulties arose as a result of excessive irregularities in the reflector surfaces brought about by poor workmanship on the part of the manufacturers. These were not KS reflectors. Also important was the fact that the local forces did not detect these irregularities before the reflectors were mounted on the towers. Thus considerable time and effort was expended in running down the trouble.

In one case involving several "knockdown" type reflectors, rewelding of supporting braces was done by the local telephone people in order to correct the trouble. Such a procedure is not normally recommended but in this case appeared to be the only way to meet the service date. In the second instance, three 8 x 12 reflectors were replaced with reflectors of another manufacturer and an improvement in received signal level of 5-7 db was experienced with each reflector replacement.

These experiences have pointed up the importance of applying the following precautionary measures to insure satisfactory performance of periscope antenna systems.

1. Check the reflector surface for flatness after assembly and before elevating the reflector by carefully observing its surface for major irregularities. This can be done by stretching a string or placing a straight edge across any questionable section of the reflector and observing the deviation of the surface from flatness. A tolerance of $\pm 1/16$ of the operating wavelength has been set for this deviation. For additional details, refer to BSP R40.486.11 on the KS-16320 reflector.
2. Employ reflectors with easily operated arrangements for both vertical and azimuth adjustments. For 11 kmc systems the KS-16320 reflectors are recommended whereas at 6 kmc either the KS-16320 or others with suitable

adjusting mechanisms may be used.

3. Exercise care in hoisting and mounting reflectors, particularly on guyed towers so as to avoid dents in the reflecting surface or distortion of other parts of the reflector.

3

ST. LOUIS-EL PASO TD-2 ROUTE

A new major TD-2 route is being laid out by the Long Lines Department. It will extend from Hillsboro, Missouri (a station on the St. Louis by-pass route) to Adams, Texas (near Dallas) and thence to El Paso. Eventually it is expected that the system will be extended from El Paso to Los Angeles.

The new system will include about 1,250 route miles of new construction. Initially one protection and two message channels will be installed in each direction between Hillsboro and Adams. At the same time additional channels will also be added on existing routes to connect Adams to Kaufman, Texas and Hillsboro to Newbern, Illinois. Between Adams and El Paso plans call for one message and one protection channel each way and one westbound channel for television. Sweetwater, Lamesa, Midland and Carlsbad, Texas, will be intermediate dropping points.

4

AIRBORNE ETV - PURDUE EXPERIMENT

Test signals have been transmitted during recent weeks from the airborne television transmitters of the Purdue educational television experiment (RADIO NOTES, January 26, 1960). These were monitored by the Michigan Bell people at East Lansing with a view to the possible use of ETV material from this source by Michigan State University.

The Michigan Company recently provided new cabling between buildings on the East Lansing campus as part of a "Centrex" telephone installation for the University, and video pairs were included in the cables to provide for multichannel distribution of TV between the various buildings. If reception from the Purdue experiment airplanes proves satisfactory, ap-

propriate parts of the airborne ETV material may be put on the campus distribution system at Michigan State and used as part of their educational program.

East Lansing is approximately 170 miles from the far side of the path flown by the airplanes. They fly at 23,000 feet in a circle of 10 miles radius centered over Montpelier, Indiana. Preliminary computations indicated that East Lansing would be expected to be within the range of satisfactory transmission and the monitoring by the Michigan Bell people showed a received signal very close to the computed level.

The Bell System was represented at a meeting of the Technical Advisory Committee for the Purdue Experiment in Lafayette, Indiana, June 1. The meeting discussed a number of problems that had showed up during the trials, and considered the steps needed for improvement. Further tests are planned for August with a view to going into a full-scale operational trial when schools open in September.

Plans call for studies of radio propagation and field intensity tests to determine the effective service area of the project. The Bureau of Standards has already made theoretical studies in this connection, and the Bell Laboratories has offered to assist in the analysis of field strength measurements, and possibly with further theoretical studies.

5

150 MC "BELLBOY" TRIAL IN MANHATTAN ENDS

The trial of the 150 mc BELLBOY service in Manhattan (RADIO NOTES October 31, 1960 and February 28, 1961) has been completed and the trial equipment is being removed. The equipment performed very satisfactorily during the trial period. The statistical people have surveyed the trial participants and are presently tabulating the results. A number of design improvements will be included in the production models of both the terminal equipment and the pocket receivers as a result of the trial.

Production of 150 mc BELLBOY equipment by the Western Electric Company (radio transmitters by the General Electric Company) is planned to start in the first quarter of 1962. The first three systems will probably be installed in (1) Washington, D.C., to provide common carrier

service to government and military personnel as well as other customers (2) Seattle, Washington for their "Century 21" World's Fair and (3) New York City. Installations in other cities are planned to start in the second quarter of 1962.

Information describing the new 150 mc BELLBOY system, including ordering information will be sent to the Companies soon in the form of a General Letter.

6

"R" BSP'S BEING CONVERTED TO PLANT SERIES

We have started the project of converting all radio practices from the "R" series to the new universal Plant Series. This is in line with the System-wide adoption of the Plant Series plan which was announced in P.E.L. 6405/P.O.L. 1797, dated March 3, 1959. Many practices in other BSP Series already have been or are being converted and all practices will be numbered into the Plant Series in the future.

A PEL regarding our radio practice conversion will be issued later. Meantime, the general plan for Plant Series numbering of radio BSP's is being drawn up. Once this basic groundwork is done, we can begin the actual transition work on existing practices. This will lead to new practices being issued to you in two phases. We estimate the overall project will take approximately two years.

Besides transferring all standard A.T.& T. Co. "R" series sections to the Plant Series, we will assign new numbers to your locally prepared radio practices. This will result in all Radio BSP's appearing in the number block 400-000-000 to 449-999-999 in the new nine-digit plan. To meet our schedule, we must hold to a minimum revisions not directly associated with the conversion. We do plan, however, to incorporate all existing addenda and appendices into the new practices.

Watch for our PEL which will give you more details.

7

SOME COASTAL HARBOR GROWTH

At a time when new Coastal Harbor channels are indeed a rarity, we find the unusual in two

different Bell System additions now being engineered. The Pacific Company is adding a fourth public correspondence channel at their San Pedro Station KOU. At the same time, Southern Bell now has a frequency pair available for providing 2 mc maritime mobile telephone service on two lakes in the heart of Georgia.

San Pedro KOU

The additional frequency pair 2466 kc (coast) and 2382 kc (ship) was made available for maritime service in the San Pedro area after release from another use. The F.C.C. has granted a construction permit to the Pacific Company. Latest views look toward a service date of about October 1961 for this new channel.

A new Gates Type M-5399 transmitter will be installed to match the existing units at the KOU transmitter building. Through the use of a special diplexer arrangement, the output of the new transmitter will be fed into one of the three present antennas (RADIO NOTES, August 28, 1959). Standard Western Electric E-1 control terminal and 23-type receiver equipment, which the Pacific Company has on hand, will be used to complete this installation.

Georgia Lakes Station

The new Southern Bell shore station facilities will provide public telephone service to the many radio-equipped watercraft on Lakes Allatoona and Sidney Lanier in Georgia. Following several months of tests and studies searching for usable frequencies, the Southern Company now has the frequency pair 2450 kc (coast) and 2366 kc (ship) available for this purpose. Through FCC Rule-making, these frequencies became available effective June 22, 1961.

Plans are to install individual radio facilities on each of the two lakes. These two sets of transmitters and receivers will be operated on a coordinated basis from a common G-2 control terminal and switchboard. Two Aeronautical Communications Equipment Model 100-TFA transmitters with outputs of about 100 watts will be used on the public correspondence channel. Apelco 100-watt transmitter-receiver equipment is to be used for the 2182 kc safety-calling channel facilities.

Southern Bell will begin offering service as soon as F.C.C. authorization and subsequent equipment installation work can be completed.

8

AUSTIN BAILEY RECEIVES U. OF KANSAS CITATION

Friends of Austin Bailey, who retired as Mobile Radio Engineer in 1958, will be interested to hear that he was named to receive a citation from the University of Kansas at commencement exercises on June 5, for distinguished service to mankind.

Mr. Bailey is a native of Lawrence, Kansas, and received a bachelor's degree from the University in 1915. He then attended Cornell where he earned a doctorate. Before joining A.T. & T., he was a professor of physics at the University of Kansas.

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ORGANIZATION CHANGE

Mr. B. Buffo of the Special Projects Radio Group is retiring July 31. His last day in the office is June 29. Buff plans to make his home in Morris, Illinois.

John C. O'Shea of the New Jersey Bell Telephone Company joined the Special Projects Radio Group on June 1st. Jack will work on non-Western microwave systems for message service. He can be reached on EX 3-3770.

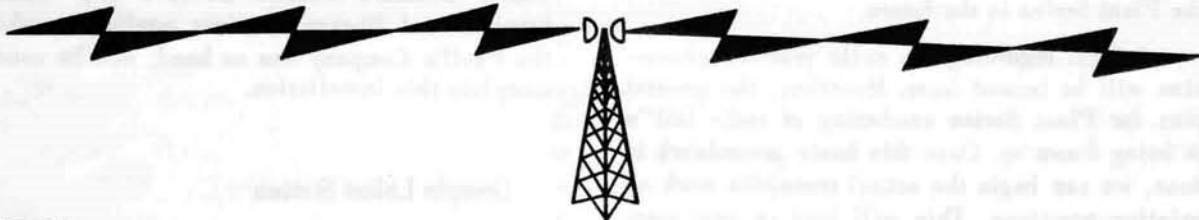
Russell F. Johnson of the Special Projects Radio Group has accepted a position as Supervising Engineer in the Radio Transmission Group of the Mountain States Co. effective June 1. Russ has been a member of the Engineering Dept. here at "195" since 1959 and has been engaged in the preparation of BSP's.

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RADIO INFORMATION

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

BSPM 767	A301.924,	Issue 1 - J86486 Tube Cooling System - Operating Methods
	A501.924,	Issue 1 - KS-16616 Air Filter - Replacement Parts and Procedures
	AA264.095,	Issue 2 - TD Radio - Types A, B and C Wire Line Entrance Links and TJ Radio - Type A Wire Line Entrance Link - Toll Systems
	AA265.506,	Issue 4 - A2A Video Transmission System - Terminal and Repeater Equipment - Television Systems
	AA266.081,	Issue 1 - TH Radio - Automatic Protection Switching Bay Equipment - Toll Systems
	AA367.047,	Issue 2 - TH Radio - Tube Cooling System - Equipment - Power System



	AA636.768,	Issue 1	- TH Radio - Performance Requirements - J68406A FM Terminal Transmitter
	AA636.769,	Issue 1	- TH Radio - Performance Requirements - J68406A FM Terminal Receiver
BSPM 767A	-		
BSPM 767B	-		
BSPM 768	R60.510,	Issue 5	- TD-2 Automatic Protection Switching Controls (General)
	R60.513,	Issue 5	- TD-2 Automatic Protection Switching Controls (Maintenance Routines)
	R60.514,	Issue 5	- TD-2 Automatic Protection Switching Controls (Maintenance Methods)
	R60.515,	Issue 2	- TD-2 Automatic Protection Switching Controls (Description and Operating Principles)
	App. 2		
	AA266.082,	Issue 1	- TH Radio - Automatic Protection Switching Equipment - Panels, Mountings and Plug-in Units - Toll System
	AA266.086,	Issue 1	- TH Radio - Dade Test Set - Toll Systems
BSPM 768A	-		
BSPM 768B	-		
BSPM 769	App.1		
	AA266.039,	Issue 3	- TD Radio - Transmitter-Receiver - Test Set - Toll Systems
BSPM 769A	-		
BSPM 769B	000-000-000,	Issue 6	- Numerical Index Division 000 - General Information and Master Numerical Index of all Divisions
	000-000-001,	Issue 3	- Master Alphabetical Index - All Divisions
	000-010-010,	Issue 3	- Bell System Practices - Plant Series - General Plan
	951-410-100,	Issue 1	- D1 Alarm and Control Circuit and Order Wire Circuit
	951-420-100,	Issue 1	- D2 Alarm Control and Order Wire System
BSPM 770	E47.458,	Issue 1	- Television Systems - 9A (J64009A) Video Distortion Meter - Low Frequency, 15 to 300 kc
	AA367.054,	Issue 1	- Power Supply for TL Radio - Power Systems

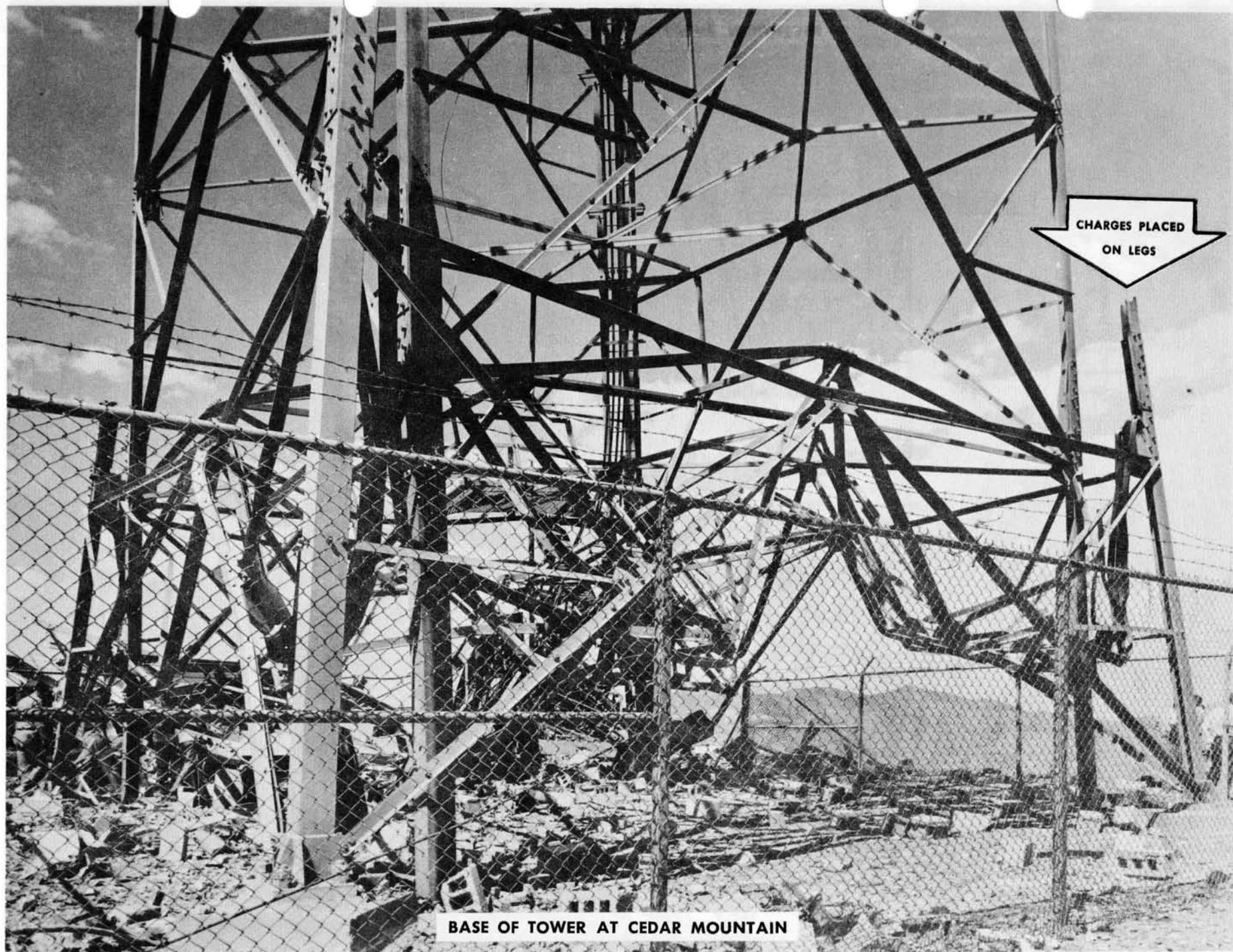
BSPM 770B	-	
BSPM 771	AA636.771, Issue 2	- Performance Requirements - Basic Message Connecting Link for Connection of L Supergroups 1, 2, 3 and 4 to TJ or TL Radio - Toll Systems
	AB46.359A, Issue 2	- 359A Electron Tube Data Sheet
	AB46.425A, Issue 3	- 425A Electron Tube Data Sheet
	AB49A.12F, Issue 1	- W.E. 12F Transistor
	AB49A.12G, Issue 1	- W.E. 12G Transistor
	AB49A.12H, Issue 1	- W.E. 12H Transistor
	AB49A.16A, Issue 1	- W.E. 16A Transistor
BSPM 771A	-	
BSPM 771B	-	
BSPM 772	R50.620.00, Issue 1	- BELLBOY Personal Signaling Service, Stromberg-Carlson Control Terminal - (35 mc Systems)
	R50.623.00, Issue 1	- Frequency of Maintenance Routines
	R50.624.00, Issue 1	- (Maintenance Methods)
	R50.624.01, Issue 1	- Testing the Tone Generator Circuit
	R50.624.02, Issue 1	- Testing the Register Circuit
	R50.624.03, Issue 1	- Testing the Signaling Control Circuit
	R50.624.04, Issue 1	- Testing the Transmitter Control Circuit Panel
	R50.624.05, Issue 1	- Testing the Transmitter Identifier Circuit
	R50.624.06, Issue 1	- Testing the Test and Supervisory Circuit
	R50.624.07, Issue 1	- Testing the 222A Interlock Control Unit
	R50.625.00, Issue 1	- (Description and Operating Principles)
BSPM 772A	-	
BSPM 772B	-	
BSPM 773	-	
P.E.L. 6821	TL Radio System	- Equipment Engineering Information
P.E.L. 6849	Microwave Towers	- Consulting Service for Modification of All System Standard Towers
P.E.M. 7592	Mobile Telephone Service	- Modification of Early Model Western Electric Company 540A Radio Transmitter for Narrow Band Standards (1S3.1-101)

Unnumbered Letter to Operating Vice Presidents

5- 3-61

A.T.& T. Response to F.C.C. Inquiry into Administrative Space Communications Problems

5-12-61	A.T.& T. Testimony in House Committee on Science and Astro- nautics on Communications Satellite Systems
5-22-61	A.T.& T. Reply to Response in F.C.C. Inquiry into Administra- tive Space Communications Problems
Explanatory Statement to Vice Presidents and General Managers	
5-17-61	TL Radio System - Equipment Engineering Information
Unnumbered Letter to Chief Engineers	
5- 9-61	Satellite Relays and Broadcasting
Unnumbered Letter to Traffic Managers	
5- 1-61	Mobile Telephone Service - Number Assignment Plans
Unnumbered Letter to Marketing Dept.	
5- 5-61	Private Mobile Telephone Service - Current Situation
Unnumbered Letter to Plant Supervisors	
5- 1-61	Mobile Radio Cost Results Summary
5-24-61	Mobile Service Trouble Summary
6- 1-61	Mobile Radio Cost Results Summary



CHARGES PLACED
ON LEGS

BASE OF TOWER AT CEDAR MOUNTAIN



BUILDING

TOWER AND BUILDING AT CEDAR MOUNTAIN



INTERIOR OF BUILDING AT WENDOVER



EQUIPMENT BUILDING AT CEDAR MOUNTAIN

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