



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

VOLUME 16, No. 3

March 28, 1961

1. Bell System Response Filed in F.C.C. Space Inquiry (Docket No. 13522)
2. Understanding Between F.C.C. and NASA on Space Communications Activities
3. Commercial Service on TH Radio
4. TL Radio Demand
5. Out of this World Telephone Call
6. Fire in Nevada TD-2 Radio Relay Station
7. Overseas and High Seas 1960 Service Results
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Attached – Short Haul Microwave Summary

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1. CENTRALIZED FREQUENCY CHECKING

The New York Telephone Company has developed an interesting arrangement for keeping a close watch on the carrier frequency and modulation deviation of base and mobile transmitters in the 450 mc land mobile system in New York City, to improve the day-to-day performance of the system. Multi-channel receivers covering all transmitter frequencies are installed at a central location (Empire State Building) where most mobile as well as all base transmissions can be picked up. These receivers are maintained "on frequency" within a close tolerance by frequent checks against a Hewlett-Packard frequency counter and an associated WWV receiver. The discriminators of the monitoring receivers are calibrated and connected with auxiliary circuitry so as to provide direct visual readings of carrier frequency error and modulation deviation. The limiters in these receivers are also calibrated to give indications of relative signal strength. As a further step, a motor driven switch is arranged to automatically sample mobile transmissions for frequency on the several channels.

These or similar arrangements may be of interest in other operating areas, as a possible means of making mobile service more uniform and reliable. Bill Chaney and Ed Borden invite your questions, suggestions or comments concerning frequency checking methods.

2. CONELRAD DRILL CLARIFICATION

A number of questions have been received concerning CONELRAD alerting procedures described in F.C.C. Public Notice 84990, dated February 26, 1960 (RADIO NOTES, March 25, 1960) covering the scheduled May 3 Operation Alert drill. Questions relate to the statement, "The normal CONELRAD alerting system will not be used to begin the drill". This statement, combined with the remainder of the notice, implies that no carrier break will occur prior to the 1000 cycle tone broadcast. The changed alerting procedure relates only to CONELRAD voice transmissions and does NOT alter the normal sequence of carrier breaks and 1000 cycle tone application used to trigger a CONELRAD receiver alarm.

It is particularly important at locations using Motorola CONELRAD Monitors that the 1000 cycle tone be preceded by at least one carrier break; otherwise, the alert condition will not be detected.

3. EMERGENCY RADIO IN ALABAMA

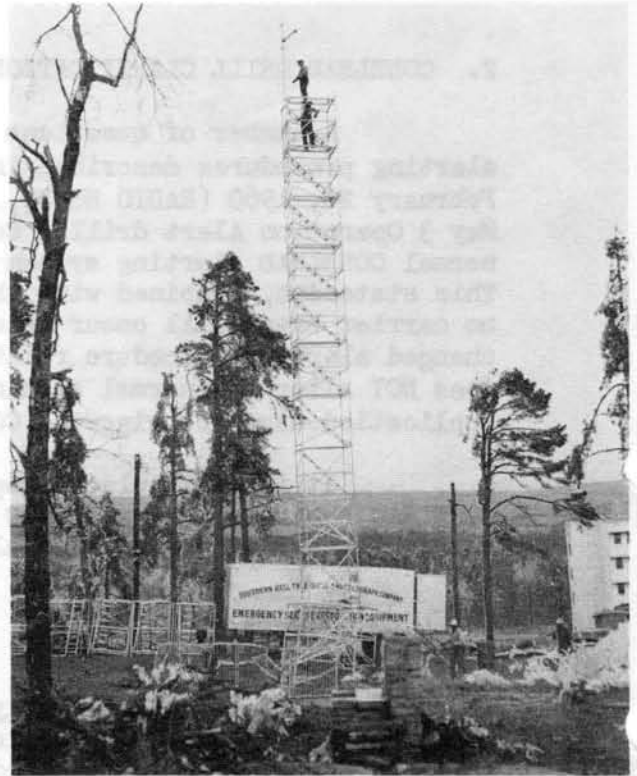
Southern Bell recently made good use of their UHF emergency radio equipment to restore toll service in northern Alabama. Ice and snow storms early in March severely crippled lines serving three Bell exchanges - Boaz, Albertsville and Guntersville, and several Independent Company offices.

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South Carolinas's emergency radio vans (RADIO NOTES, January 26, 1960) were set up between Gadsden and Albertsville. This 28 mile emergency route was covered in two hops with the repeater on a mountain ridge 8 miles out of Gadsden. The photographs are action shots taken during the restoral operation.

A total of 19 telephone and 5 telegraph circuits were provided on the emergency radio layout. Satisfactory service was furnished in this manner for over a month while toll circuits were being re-established.



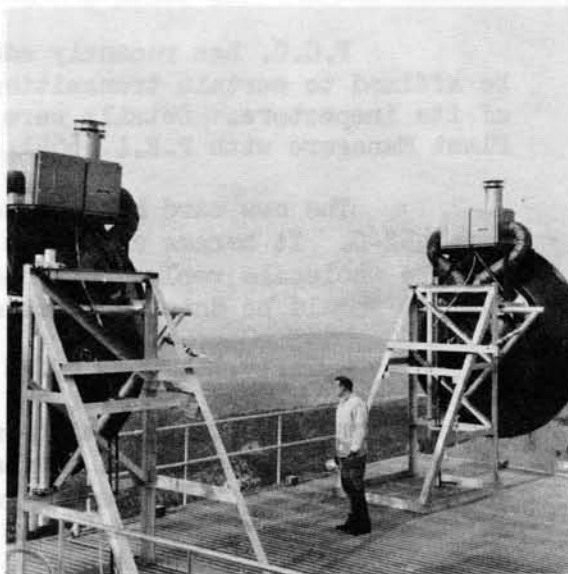
4. WHITE HOUSE AWARD

Seventeen Long Lines men and one from the C. and P. Company of Virginia were awarded commemorative medallions by the White House for their excellent handling of a rush communications job connected with President Eisenhower's tour of South America. (RADIO NOTES, March 25, 1960) The silver medallions, inscribed "South America 1960" and bearing President Eisenhower's signature, were presented to the men at Long Lines Headquarters by Lt. Colonel George J. McNally, Commanding Officer of the White House Army Signal Agency.

The Long Lines men who received the award were: D. D. Donald, Radio Engineer, who supervised the operation; J. E. Heinrich, Overseas Staff Supervisor who was Long Lines liaison for communications arrangements for the entire tour; S. J. Balchan, C. S. Borthwick, D. W. Chamberlain, J. T. Neiswinter, H. W. Reichel, K. P. Stiles and J. R. Wenrich of New York; A. D. Adams, D. J. Curran and L. K. Garland, Ft. Lauderdale, Florida; E. H. Rice, Jr., Springfield, Massachusetts; J. J. Legler, Nashville; J. D. Crain, Kansas City; M. W. Kettlehake, Cincinnati, and L. A. Peplin, Chicago. The C. and P. man was W. E. Thomas of Norfolk, Virginia.

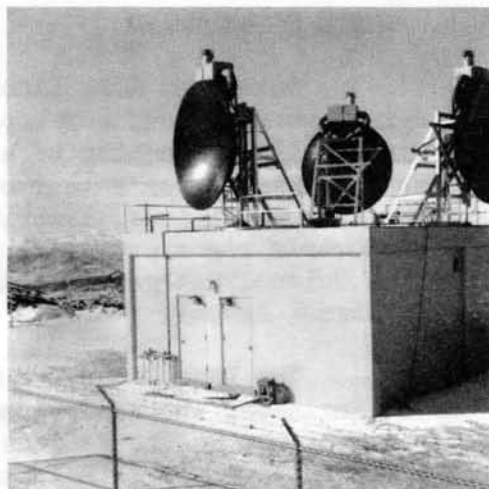
5. HOT AIR ANTENNA HEATERS

The Bell Telephone Company of Nevada has recently installed thirteen 10 foot dish-type microwave antennas heated by a new propane fired, hot air arrangement developed by Gabriel Electronics for this specific application. These antennas are part of an extensive TJ and Lenkurt 74A microwave system (RADIO NOTES, November 17, 1958) in the high mountain areas of western Nevada where icing conditions can be severe. Standard electrical heating of these large dishes would overload the no-break engine alternator power units used on this route. Hot air proved to be the more economical heater arrangement and has an added advantage of minimizing the voltage regulation difficulties associated with large intermittent electrical heater loads.



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The photographs show propane heated antennas at two stations on this route. Heated air from the propane heater, mounted to the rear and near the top of the antenna, is forced through the circular duct into a space between the dish and special back spinning attached to the rear of the dish. This back spinning is heat insulated in a manner to confine heat dissipation to the dish surface. Deflection vanes are provided to obtain uniform area heating. The air is then returned to the propane unit through the other circular duct for reheating and recirculation.



The heater will deliver about 50,000 BTU per hour and requires two pounds of propane fuel per hour of operation. Heated air is regulated to the 135-145°F temperature range. Heater operation is controlled by thermostat to furnish heated air when the outside temperature is in a range of 20-38°F - temperature range where icing frequently occurs. Power requirement for the heater blower is 280 watts. Electrical feed horn heaters are still required.

6. NEW TRANSMITTER IDENTIFICATION CARD

F.C.C. has recently adopted a new identification card which must be affixed to certain transmitters to provide information for the convenience of its inspectors. Details were sent to the Chief Engineers and General Plant Managers with P.E.L. 6641.

The new card has the same code number as the old card - F.C.C. Form 452-C. It became effective April 10, 1960. It will not be necessary to make wholesale replacements of the old cards even beyond April 10, 1960. The job should be done on an orderly basis at the convenience of the Companies.

Briefly, the new rules are based upon the use of a transmitter identification card whenever the radio station license is not displayed in the same room as the transmitters or the transmitters are not in view of or are not readily accessible to the operator at the principal control point. Where control points are employed at fixed locations, a check of the F.C.C. rules will show that the station license must be displayed at the principal control point.

To sum up, identification cards:

1. will not be required on fixed transmitters when the station license is displayed in the same room as the transmitters. This would include point-to-point microwave transmitters.
2. will not be required on transmitters of other services such as Base, Rural, Coast, etc., which are operated from fixed locations, when the transmitters are in view of or readily accessible to the operator at the principal control point. (The station license is displayed at the control point.)
3. In the case of mobile or temporary fixed stations, identification cards must be affixed to transmitters if the transmitters are in view of the operating position or if they are readily accessible for inspection. Where these conditions do not apply, cards must be attached to the control equipment. For general mobile service, identification card installations for passenger cars is covered in Bell System Practice, Section R90.416.01; for water craft, in Section R90.416.04; and for trucks and special purpose vehicles, Section R90.416.02 (now under preparation). There are no standard procedures for units of "private mobile systems due to the wide variety of installation arrangements.

It will be noted that Section 21.202 (Common Carrier Rules) is not worded the same as similar sections of other parts of the F.C.C. Rules. The F.C.C. is taking steps to make appropriate amendments and are advising their local inspectors of the rule interpretations discussed above.

The F.C.C. Order permits the production by the licensee of a metal plate or other durable substance to be attached to the transmitters instead of the 452-C form. A standardized item of this type for Bell System use is now being considered.

7. WIND DAMAGE

One stormy night in March high winds worked a nut off the horizontal adjusting rod of a 10 foot, TD-2 dish type antenna and snapped the flex guide connected to the feed horn. Wind then pivoted the dish 90° relative to the radio transmission path leaving the jagged open ended flex guide aimed roughly down the path sagging about 20 degrees below the horizontal. In spite of this severe damage a useful signal was maintained over the microwave path.

The damage occurred on a Michigan Bell, 350 foot tower at their Forsyth station in the Upper Peninsula where extremely severe winter conditions are commonly encountered. Although the noise on the damaged

radio system carrying three supergroups of "I" had increased considerably, about 60% remained in service until temporary repairs could be made about 24 hours later. Some of the circuits were still useful to a military site six hops away to the extent that an immediate release for repairs could not be obtained.

8. WHAT ARE THE COMMUNICATIONS NEEDS OF SMALL VESSELS?

For the past few years, it has been increasingly evident that the radio communications needs of the small water craft are not being adequately met. These are the non-commercial or pleasure boats which may voluntarily equip with radio. Many people on these vessels want to be able to talk conveniently and economically with other people on boats or land much as they would by telephone.

This lack of good communications has become more acute and serious to these users with the rapid increase in their numbers. The problem is further compounded by many other factors beyond their control. Among these factors are shortage of 2 mc maritime frequencies, traffic congestion on existing 2 mc channels due mainly to larger compulsorily-equipped vessels, and mandatory multi-channel ship set requirements with the resulting high cost.

Until recently, the maritime and communications industries have taken no concerted action to solve this problem. However, the Radio Technical Commission for Marine Services recently formed Special Committee No. 43 to investigate and report on the "Present and Future Communications Needs of Voluntarily-Equipped Non-Commercial Vessels". Government, manufacturing, boating organization, and communications people are serving on this special committee. The United States Power Squadrons, who represent a large portion of the small craft users, are playing a leading role on this committee. The Bell System representatives are Frank Oblinger of "195" and R. V. Crawford of the Laboratories.

The work of this committee has just begun and is expected to continue for the next several months. If you should have any views or information of your own or from users on this matter, Frank Oblinger on EX 3-2517 would be glad to hear from you.

9. TENNESSEE TJ

Southern Bell has applied for F.C.C. Permits to construct a four hop TJ message microwave system interconnecting the Tri-Cities area (Johnson City-Kingsport-Bristol) in the north east corner of Tennessee. It is interesting to note that this entire system is in Independent Company territory. Under proposed ownership arrangements, the Inter-Mountain Telephone Company will own all land, buildings and towers while Southern Bell will own the radio equipment, antennas and L carrier terminals. Inter-Mountain will be responsible for maintaining all radio and carrier equipment.

The initial installation will provide about 150 circuits to the Southern Bell toll office at Johnson City. The unusual ownership arrangements on this route proved to be the most economical method of providing the required facilities while maintaining Bell standards throughout.

10. PGVC NATIONAL CONVENTION

The Professional Group on Vehicular Communications of the IRE will hold its 11th National Convention in Philadelphia, December 1 and 2, 1960. The two day meeting will feature papers on all aspects of vehicular communications as well as exhibits by manufacturers in the field. The scope of the meeting will include land vehicular, air-to-ground, personal signaling and VHF maritime communication services. Subjects will include systems, equipment and component design. Papers on pertinent subjects by Bell System authors are invited.

An abstract of about 200 words is required for the review of the Papers Committee by July 15, 1960. These should be sent to W. G. Chaney, A.T. & T. Co., 195 Broadway, Room 1710, New York 7. Authors will be notified by August 15, 1960 of their acceptance.

11. 8-CHANNEL MOBILE TELEPHONE SET

The Boston Area of the New England Telephone Company has built, and is planning to offer for service, a 5 to 8 channel mobile set. They report that this is a modification of a 4 channel G. E. Progress Line mobile set using standard, easily obtainable parts. The cost is estimated at about \$25 plus a second G. E. Company 4 frequency "deck" and a SEL 1315 Scantlin Selector. It requires about 6 hours to put together and install.

The set was initially built to meet the request of a customer who wanted to use the four Boston Urban Channels as well as three channels outside of Boston. Several other customers are interested.

Essentially the Boston modification consists of removing the VSI Selector from a WTA/E or BA/E mobile set and replacing it with a mounting panel and a second 4 frequency deck. A Scantlin 1315 Selector is substituted at the junction box. Extra cabling required to switch the added oscillators is brought out through a plug and socket added to the front panel of the radio case. An eight button switch box is used in place of the G. E. multi-frequency selector.

Details on the modification can be made generally available if there is system interest. Call Bill Chaney, EX 3-3029 if you want more information.

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12. BENCH POWER SUPPLIES FOR MOBILE SETS

Subsequent to a number of inquiries, we asked the General Electric Company engineers what power facilities they recommend for routine servicing of mobile sets with transistor power supplies. They told us that any 12-volt power source suitable for vibrator units will also serve for these sets. They recommended a commercial grade battery eliminator with standard 12-volt batteries floating across the output. This closely duplicates the conditions under which sets normally operate.

Where detailed maintenance is being performed, G. E. Company engineers suggest a regulated power supply, continuously variable from 10 to 16 volts output over any loading from 0 to 30 amperes with a ripple of less than 1%. This will provide more flexibility than is required for typical Telephone Company service centers but may prove convenient at locations doing major repair work.

13. TH BETWEEN JENNERSTOWN, PENNSYLVANIA AND NORWAY, ILLINOIS

Long Lines is planning a new installation of TH microwave equipment on the existing TD-2 express route from Jennerstown, Pennsylvania to Norway, Illinois. This system will connect with TH being installed between Jennerstown and Colesville, New Jersey. (RADIO NOTES, August 28, 1959) It is part of the long range plan of providing a high capacity radio route across the north central part of the country and on to the West Coast. It will tie in with the Prospect Valley-Salt Lake City Junction TH system now under construction by Long Lines and undergoing field tests by the Bell Laboratories.

The proposed system from Jennerstown to Norway includes installations at 23 microwave stations. The new construction will add 2 broad band channels of TH in each direction to provide message telephone service and a protection channel. The installation will also include 2 narrow band auxiliary channels each way for order and alarm facilities and for transmission of protection switching signals. Service date for this latest TH installation is set for June 1961.

14. ORGANIZATION CHANGE

Walter K. MacAdam, Assistant Chief Engineer, was elected a Vice President of the American Telephone and Telegraph Company on April 6, 1960. He will continue to report to Vice President Dingman and will be responsible for matters pertaining to military and defense work and for coordinating Bell System activities in this field. He has headed the Engineering B division here at 195 since October 1, 1959 and has taken an active part in radio and F.C.C. matters during this period.

15. RADIO INFORMATION

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

- | | | |
|----------|--------------|---|
| BSPM 710 | Al401.919, | Issue 1-D - Waveguides - Associated with Delay Lens Antennas - Static and Dynamic Pressures - TD-2 Radio Relay System - Requirements and Adjusting Procedures |
| BSPM 711 | 357-000-000, | Issue 2 - Numerical Index - Division 357 - Wire Line Entrance Links for Interconnection of Radio and Carrier Telephone Systems |
| | 357-020-100, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities |
| | 357-020-300, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - Maintenance Tests |
| | 357-020-500, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - General |
| | 357-020-501, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - Initial Tests and Adjustments |
| | 357-020-502, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - Equalization and Gain Frequency Line-Up Tests |
| | 357-020-503, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - Over-All Line-Up |
| | 357-020-504, | Issue 1 - Type A Wire Line Entrance Link for Interconnection of TJ Radio and L Carrier Facilities - Pilot Adjustments |

357-020-505, Issue 1 - Type A Wire Line Entrance Link
for Interconnection of TJ Radio
and L Carrier Facilities - Pilot
Measurements

BSPM 711A -

BSPM 712 -

BSPM 712A -

BSPM 713 -

BSPM 713A -

P.E.L. 6613 Mobile Telephone Service - G.E. Co. 250-Watt Urban
Band Base Station (1S3.1-97)

P.E.L. 6641 Amendment of F.C.C. Rules Concerning Transmitter
Identification Cards (1S4.1-224)

P.E.M. 7165 TJ Radio System - Mounting Arrangements, Ordering and
Pricing Information for Five- and Ten-Foot Parabolic
Antennas (1S3.9J-14)

Unnumbered Letters to Chief Engineers and General Plant Managers

3-18-60 General Mobile Telephone Service Improvement

4-6-60 Mobile Telephone Service - Receivers for Signaling
Only Service (1S3.2-60)

OFF-THE-AIR TV MICROWAVE SYSTEMS

<u>TV Station Location</u>	<u>Pickup Point - Route</u>	<u>Equipment</u>	<u>Hops</u>	<u>No. of Channels</u>	<u>Pickup Path (Miles)</u>	<u>Color</u>	<u>Service Date</u>
<u>LONG LINES</u>							
Sioux Falls	Arlington-Garden City, S.D.	Motorola	2	1	55	No	9-20-55
Columbus	Texasville-Dothan, Ga.	Motorola	1	1	56	No	9-30-55
Fargo	Valley City-Bismarck, N.D.	Motorola	4	1	55	No	10- 4-55
Pensacola	Niceville-Panama City, Fla.	Motorola	2	1	50	No	4-19-56
Minneapolis	Zimmerman-Fargo, N.D.	TD-2 - Motorola	7	2	30	Yes	10- 4-57
Denver	Crow Creek-Casper, Wyoming	TD-2	6	1	94	No	12-27-57
San Antonio	Pearsall-Laredo, Texas	Motorola	3	1	53	No	8-20-58
Montgomery	Orion-Dothan, Ga.	Motorola	2	1	31	No	1- 2-59
Cedar Rapids	Marble Rock-Kensett	Motorola	1	1	65	No	2-25-59
Portland	Liberty-Copeland Hill, Maine	Raytheon	1	1	60	Yes	7- 1-59
Memphis	Hughes-Little Rock	Motorola	4	1	39	Yes	11-25-59
Chattanooga	Monteagle-Huntsville	TD-2	3	1	38	No	CP's granted
Pittsburgh	Morgantown-Clarksburg, W.Va.	Motorola	2	1	51	No	CP's granted
San Antonio	Mineral-Robstown, Texas	TD-2	2	1	70	No	CP's granted
San Antonio	Mineral-Harlingen, Texas	TD-2	7	1	70	No	CP's granted
Green Bay	Caroline-Wausau, Wisc.	TD-2	1	1	48	No	6-30-59
<u>MOUNTAIN STATES</u>							
Denver	Monument-Colorado Springs, Colo.	Motorola	1	1	55	No	11- 2-56
Denver	Crow Creek-Gasper, Wyoming	Philco	6	2	94	Yes	1-14-54, 7-22-57
Denver	Crow Creek-Rawlins, Wyoming	Motorola	3	2	94	No	4-29-57
Denver	Crow Creek-Gasper, Wyoming	TD-2 - Philco	6	1	94	Yes	CP's granted
<u>NEW YORK & NEW ENGLAND</u>							
Schenectady	North Hebron-Plattsburg, N.Y.	TD-2 - RCA	3	1	50	No	1-31-57
<u>PACIFIC</u>							
Los Angeles	Red Mtn.-Santa Barbara, Calif.	Motorola	1	1	73	Yes	7-25-56
Los Angeles	Monument Peak, Winterhaven, Calif.	TD-2	1	1	135	No	7-31-56
San Francisco	Mt. Rose-Reno, Nev.	TJ - Motorola	2	4	140	Yes	CP's granted
<u>SOUTHERN</u>							
Miami	Rock Harbor-Stock Island, Fla.	TD-2	5	2	52	Yes	12- 7-56, 4-29-57