

Radio Notes

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

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Attachment - Map: Bell System Overseas Telephone Service



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FREQUENCY ALLOCATIONS - 25 TO 890 MEGACYCLES

1

Greetings...



Everyone in the Radio Section at "195" joins in wishing all of our friends a very merry Christmas and a most rewarding New Year.

Ed Wepler

2

TELSTAR REFUSES TO TAKE ORDERS

Telstar's command system began to act erratic during the third week in November, at which time it became increasingly more difficult to perform command functions from the Andover ground station. Beginning about November 24 to the present (Dec. 7, the time of this story) there has been a complete loss of command control over the satellite. This problem is currently under intense study at the Bell Laboratories. Hopefully, there may still be a chance to take some corrective action.

With an inoperative command system, Telstar is silenced as far as communication experiments are concerned since one of the most important functions of the command system is to activate and deactivate the traveling wave tube. Fortunately the telemetry channel was commanded on and has been operative ever since, sending back useful data on the condition of the satellite as well as radiation damage and intensity data.

Based on telemetry data and circuit studies the most probable cause of the trouble has been isolated to the command decoder. The 123 mc signal from the command transmitter arrives at the satellite at -80 to -100 dbm depending on range and satellite orientation. For reliability, the system includes two radio receivers to receive the pulse-coded commands and two decoders to translate the received pulses into usable instructions. This is followed by the command switching unit that controls nine relays which turn the appropriate circuits on and off. There are a total of 15 command functions built into the system.

All the experiments originally planned for Telstar have been carried out. In addition to more than 250 technical tests covering every aspect of transmission, there have been some 400 demonstrations. These demonstrations have included multichannel telephony, telegraphy, data, telephoto and other facsimile transmissions. Transatlantic television has been demonstrated 47

times and on five of these occasions the transmission was in color.

At the same time that tests and demonstrations were being handled with the communications receiver and transmitter, the telemetry functions continued. And with the telemetry still operative, more will be learned about space environment and its effects on satellite components.

3

MEETING OF XTH PLENARY ASSEMBLY OF CCIR

The Xth Plenary Assembly of the International Radio Consultative Committee (CCIR) originally planned for New Delhi, India, has been shifted to meet in Geneva, Switzerland, from January 16 to February 15, 1963, because of the uncertain international situation in Asia.

A. C. Peterson and H. W. Evans of the Bell Laboratories, K. P. Stiles of the Long Lines and H. E. Wepler and R. D. Campbell of A. T. & T. Engineering will attend the conference.

The CCIR is one of two technical committees which form part of the organization of the International Telecommunications Union (ITU), the other committee being the International Telegraph and Telephone Consultative Committee (CCITT). These committees are charged with the study of technical and operating questions in their respective fields.

The principal work of the CCIR is handled through 14 Study Groups which are listed below:

- I - Transmitters
- II - Receivers
- III - Fixed Service Systems
- IV - Space Systems
- V - Propagation
- VI - Ionospheric Propagation
- VII - Standard Frequencies and Time Signals
- VIII - International Monitoring
- IX - Radio Relay Systems
- X - Broadcasting
- XI - Television
- XII - Tropical Broadcasting
- XIII - Mobile Services
- XIV - Vocabulary

The Regulations of the ITU provide that meetings of the CCI's should normally be held every three years. In the interim between Plenary Assemblies, the various study groups carry on their work by correspondence and meetings where necessary. The last meeting of the CCIR Plenary Assembly was held at Los Angeles in 1959. The

A.T. & T. Company is a member of the CCI's in its own right, but representation at the meetings is carried out in full cooperation with the State Department and the Official U.S. Delegation.

In view of the fact that a common medium is used for transmission of radio signals, it is necessary to have international agreement on the technical methods used in order to prevent interference between systems operated by various countries, and since the Bell System is making extensive use of radio in its operations, it is desirable for the Bell System to participate in this work. Of particular importance at the present time is the work of Study Group IV on space systems and the meeting at Geneva is expected to adopt various recommendations concerning the operation of satellite communication services. These recommendations will then form the basis for the frequency allocations to be made for space services at the Extraordinary Administrative Conference of the ITU to be held starting on October 7, 1963.

4

RADIO USED IN EMERGENCY

Typhoon-like storms, which hit the West Coast on Columbus Day, caused extensive damage to telephone plant from San Francisco to Seattle. Continuous rains with winds reaching 100 miles per hour knocked out 161,000 stations and more than 1,700 toll circuits, isolating 57 Bell-operated and 114 Connecting Company exchanges.

Damaged power lines intermingled with telephone cables and wires presented hazards which hampered restoration work. Various types of radio equipment were used to provide emergency toll service to many of the isolated communities, both Bell and Independent, while the telephone plant was being repaired or replaced.

Mobile telephone equipped cars provided the only contact with the outside world for about 45 communities without long distance service. The mobile telephone men worked in two-man teams. On arrival at an isolated community, they first contacted the local Civic and Telephone Company officials. They then located their cars as close as possible to the center of the town where transmission was best. This service was provided on a round-the-clock basis until regular toll service was restored.

Portable VHF and microwave radio systems also played an important role during the emergency. Motorola EC type equipment was used to provide temporary toll service between six communities in Oregon. In addition, 6 kmc RCA and Lambda equipment was used to provide 40 ON channels between Canby and Molalla, Oregon, and the same type equipment was used on a two-hop system between Corvallis and Newport, also in Oregon, a distance of 41 miles. A section of open wire between Bellingham and Friday Harbor in Washington was heavily damaged and RCA 6 kmc radio equipment was used with N terminals to restore service between these points.

The major toll routes withstood the devastation of the storm. However, a majority of the TD-2 relay stations in Oregon and Washington were operating on emergency power. The Prospect Hill microwave relay station southwest of Salem, Oregon used emergency power for 13 days.

RADIO NOTES for November gave an early report from the Pacific Northwest Company on the restoral of service.

5

FAA RADAR REMOTING SERVICE

Contracts have recently been signed by C. & P. of Virginia and the Pacific Company to provide radar remoting services for the Federal Aviation Agency. These services will be furnished on a leased basis including installation and maintenance of the necessary terminal and microwave facilities.

As part of an air traffic modernization program, the FAA has installed and is operating over fifty systems which carry radar signals via microwave from radar sites to Air Traffic Control Centers. Last spring the FAA issued requests for bids on seven systems for which several operating companies prepared proposals.

The C. & P. Company will furnish the service over a new 10-hop Collins microwave system between Cape Charles and Leesburg, Virginia. The Pacific Company will construct a 5-hop Collins microwave system between Palmdale and Mt. Laguna, California. Both systems will use Collins multiplex equipment at the terminal locations.

Recently the FAA issued another request for bids to provide radar remoting service between Chicago, Ill. and Omaha, Neb. We understand that several more requests for bids will be issued within the next few months.

6

ROTATING SIGN CAUSES MICROWAVE INTERFERENCE

An interesting case of interference in a Long Lines TD-2 system has occurred recently. A 21 x 22 foot rotating sign advertising Blue Cross and Blue Shield was erected on top of a 14-story office building in Dallas, Texas, close to the southbound TD-2 path. When the sign is rotated to the correct angle, microwave energy is reflected back to the north and interferes with the northbound TD-2 channels on the same frequency at Adams, Texas, the first station north of Dallas. The reflected energy is strong enough to cause momentary operation of the automatic switching at times. To a lesser extent the same thing also occurs at Terrell, Texas, the next station east of Dallas.

Some relief was gained temporarily by changing polarization of the southbound channels, but this will not serve as a permanent solution because of other interference conflicts in the area.

The owners of the sign have agreed to cooperate in efforts to reduce the interference to a tolerable level. Plans are being made to modify the surfaces of the sign to reflect the energy upward and downward in order to reduce the amount of signal reaching the antennas at Adams and Terrell.

7

MOBILE TELEPHONE SERVICE ON ATLANTIC COAST LINE TRAINS

The Southern Bell Company plans to equip three Atlantic Coast Line trains for mobile telephone service to passengers on the Miami-New York run starting about December 12 or 13. A trial run by Southern Bell people showed that existing 150 mc base stations at 14 cities along the route provide coverage of about half the track mileage. The largest gaps occur at points reached by the train during the late night and early morning hours.

Train hostesses will be available to assist passengers to use the telephone and to report any troubles. On incoming calls to the trains, the hostesses will try to locate the passenger and bring him to the phone.

The equipment used on the train will be General Electric five-channel duplex mobile sets operating from their own 12-volt batteries which will be charged from the train power supply.

8

DISCONTINUANCE OF DELCOPHONE

The Delco Radio Division of General Motors is discontinuing production of the Delcophone used in the mobile telephone service. Orders for new units were accepted only until December 15.

Delco servicing, repair parts and manuals for the Delcophone will continue to be available to protect equipment currently in use.

The Skyphone for air-ground service is not affected and Delco will continue its manufacture.

All Chief Engineers were advised by telegram on November 28, of this situation.

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BRIDGING TO 2182 KC RECEIVER BY COAST GUARD

To supplement their safety and calling channel facilities, the U.S. Coast Guard has requested a temporary bridge to the 2182 kc/s receiver audio circuit of the coastal harbor maritime station WAK at New Orleans. This will extend the Coast Guard receiver coverage on this channel and may serve as a preliminary step toward possible FCC exemption of the continuous watch on the 2182 kc/s channel by station WAK. However, it is not the intent at this time to start negotiating for watch exemption since certain Coast Guard equipment changes at New Orleans are still in process.

As pointed out in previous RADIO NOTES articles covering the trial at WOX, New York, various other requirements also have to be met before an exemption can be considered for any Public Class IIB coast station. In general, the first step would be informal discussions with the local Coast Guard unit. Concurrence would have to be obtained from the Coast Guard that they would answer all ship to shore calls made on 2182 kc/s and tell anyone trying to make a public correspondence call to contact the coast station on the appropriate public correspondence channel. Another requirement would be to prove that the 2182 kc transmitting and receiving coverage of the Coast Guard equipment is as good or better than the Telephone Company coverage on this frequency. The transmitter coverage aspect is especially important since the Coast Guard facilities cannot be supplemented by our equipment as it may be with the 2182 kc receivers, if desired by the Coast Guard. After these steps are ex-

plored, it is recommended that any plans for formal FCC application for the 2182 kc watch exemption be reviewed with Vic Robinett (212-393-3017).

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THIRTEENTH PGVC NATIONAL CONFERENCE

The 13th National Meeting of the Professional Group on Vehicular Communications (PGVC) of the Institute of Radio Engineers was held at Anaheim, California on December 6th and 7th. The Bell System was represented by radio people from a number of Operating Companies, Bell Telephone Laboratories and the A. T. & T. Company.

Three of the seventeen technical papers were presented by Bell Laboratories people. Messrs. Nylund and Swanson described our new "Improved Mobile Dial Telephone System" (IMTS). Their paper will be published in a forthcoming issue of the "IRE Transactions on Vehicular Communication". Mr. H. A. Schneider discussed "An Approach to Multi-Channel Access for 150 and 450 mc Mobile Bands". Mr. T. L. Powers told about an 860 mc all solid state mobile transmitter built in the Bell Laboratories.

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RADIO INFORMATION

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

BSPM 842 - R10.314.42 - Issue 2 - J68336K FM Terminal Transmitter (TD-2 Radio System) - Tests and Adjustments of the J68336F Limiter-Amplifier Using the J68340A Test Bay

R10.314.45 - Issue 2 - Tests and Adjustments of the J68336F Limiter-Amplifier Using the J68337H FM Terminal Test Set

Addendum

R40.486.20 - Issue 1 - KS-16320 Passive Reflectors and Adjusting Tools - Installation of Lists 1 and 2 Passive Reflectors on Miscellaneous Structures

Addendum

R40.486.22 - Issue 1 - Installation of List 1 and 2 Passive Reflectors on the AT-7229B Self-Supporting Towers

Addendum

R40.486.30 - Issue 1 - Elevation Adjustment, List 1 and List 2 Passive Reflectors

AA266.029 - Issue 6 - Alarm Equipment for Use with Major Route - TD Radio Systems - Distribution Fuse, Individual, Audible and Visual Alarms - Toll Systems

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OVERSEAS TELEPHONE SERVICE

As of November 1962, a total of 175 countries or areas can be reached via the Bell System's (excluding Canada) overseas and international telephone service. Of the total number, 71 countries or areas are served by direct circuits while 104 are served via intermediate points.

A listing of the number of direct circuits over various types of facilities is shown below.

Cable	356
High-frequency radio	210
Over-horizon radio	80
Land (Alaska)	15
Total	661

A map is attached to this issue of
RADIO NOTES
showing the
Bell System Overseas Telephone Service.

AA355.024 - Issue 3 - Miscellaneous Equipment Units Common to Various PBX's Located at the PBX - PBX Systems

BSPM 842B -

BSPM 843 - R50.700 - Issue 1 - Public Air-Ground Telephone Service Base Station Trunk Terminating Circuit - Radio Systems

AA266.062 - Issue 2 - TJ Radio - Transmitter-Receiver Units - Toll Systems

BSPM 843A -

BSPM 843B -

BSPM 844 - R50.720 - Issue 1 - 150 mc Personal Signaling Service-J41643A Base Station Transmitter Trunk Terminating Circuit Radio Systems

R90.314.55 - Issue 2 - J68331 Transmitter-Receiver Bay - Bench Tests (TD-2 Radio System) - Transmitter Modulator

R91.114.00 - Issue 1 - Public Air-Ground Telephone System - Transmission Line-Up Tests and Adjustments

R91.114.01 - Issue 1 - Public Air-Ground Telephone System-Tests of Circuit Facilities and Inspection of Terminating Apparatus

R91.114.02 - Issue 1 - Public Air-Ground Telephone System - K1 Control Terminal-Local Tests and Adjustments

R91.114.03 - Issue 1 - Public Air-Ground Telephone System - Procedure for Recording Station Identification Announcement Using KS-16765, List 2 Announcement Set

R91.114.04 - Issue 1 - Public Air-Ground Telephone System - BO-42NA Base Radio Station - Local Tests and Transmitter Modulation Adjustments

R91.114.05 - Issue 1 - Public Air-Ground Telephone System - Base Station Receiver Squelch Setting Using the Test Converter

R91.114.06 - Issue 1 - Public Air-Ground Telephone System-Line-Up Procedure for BO-42NA Base Radio Station with K1 Control Terminal

R91.114.07 - Issue 1 - Public Air-Ground Telephone System-Talking Tests and Squelch Check Test - K1 Control Terminal to Ground Station

Appendix 4

AA227.603 - Issue 9 - TD-2 Radio - Transmitter-Receiver Bay - Toll Systems

Appendix 1

AA266.027 - Issue 6 - TD Radio - IF, Microwave and Control Units - Toll Systems

AA295.002 - Issue 2 - Direct Dispatch Service - H1 and H2 Control Terminals and Auxiliary Control Bay - Radio Systems

AA636.771 — Issue 3 — Performance Requirements — Basic Message
Connecting Link for Connection of L-Type
Multiplex to TJ or TL Radio — Toll Systems

Cancelled Section

R90.314.65 — Issue 1 — J68331A Transmitter-Receiver Bay (TD-2
Radio System) — Bench

BSPM 844A —

BSPM 844B —

BSPM 845 — AA266.079 — Issue 3 — D2 Alarm, Control and Order Wire System —
Radiotelephone Toll Systems

BSPM 845-1 —

P.E.L. 7069 — Studio-to-Transmitter Loops for Stereophonic Broadcasting

P.E.L. 8138 — Television — A2A Systems and Television Operating Centers — Elec-
tron Tube Improvements

P.E.M. 8145 — Bell System Practices — Establishment of Plant Series Division 409 —
TE, TJ and TL Microwave Radio (1F.0)

P.E.M. 8150 — Radio Systems — KS-16386 Antenna Improvements

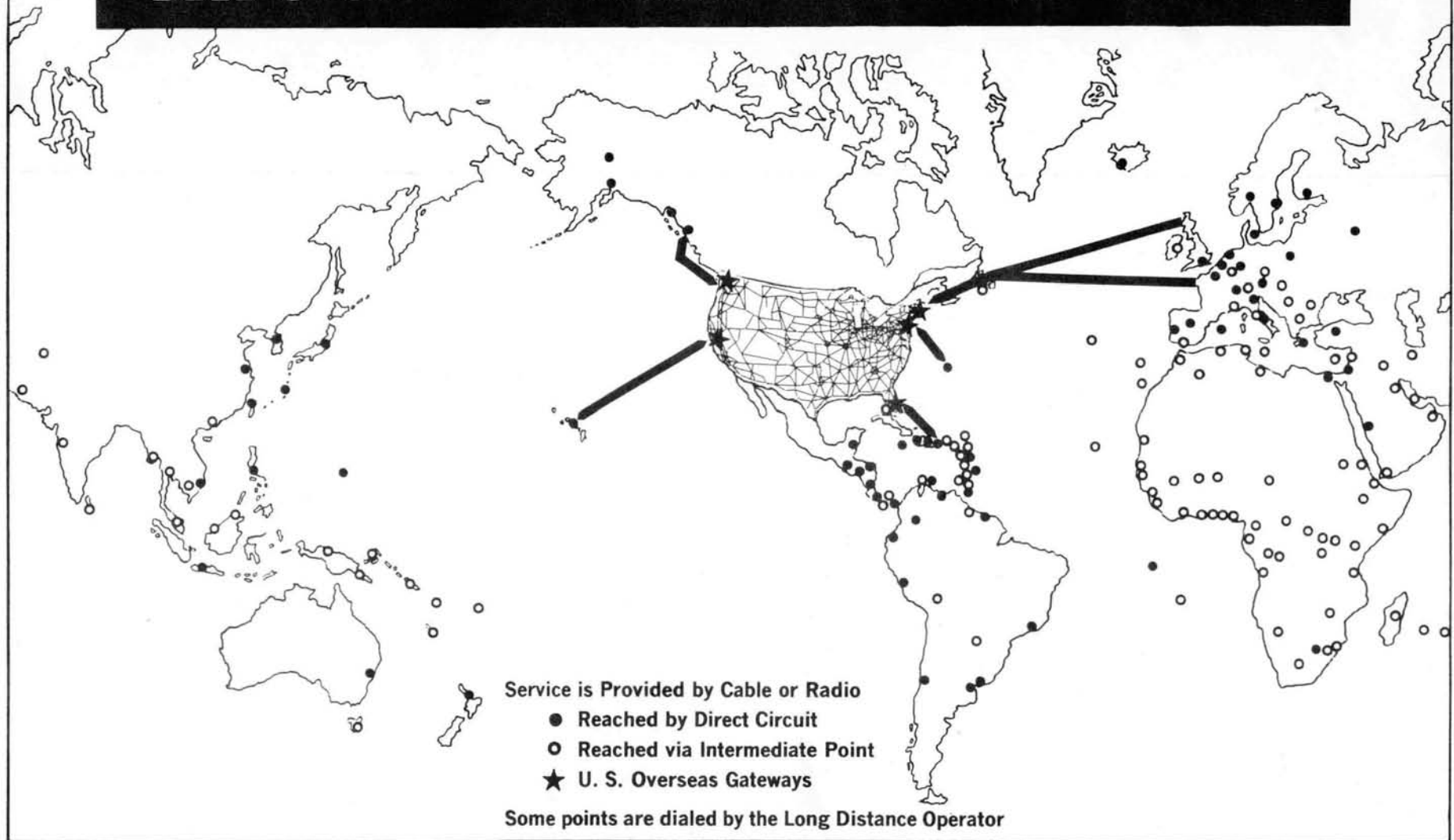
Unnumbered Letter to Selected General Traffic Managers

10-29-62 — Traffic Operating Practices — Ship Surcharges (3B5.9)

Unnumbered Letter to Marketing Departments

11-9-62 — Educational Television — Proposed Marketing Program

BELL SYSTEM OVERSEAS TELEPHONE SERVICE



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