



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

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Attached - Map of Mobile Telephone Service The Bell Telephone
Company of Canada

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1. RADIO USED ON KHRUSHCHEV TOUR

The Pacific Company was given a rush job to provide telephone service for the State Department on Mr. Khrushchev's train trip from Los Angeles to San Francisco. For this one trip Sunday morning, September 20, 1959 a Highway Channel mobile set was installed in the special train carrying the Soviet Premier and his party north. Telephone Service is a regular offering to trains on this run; however, a part of the route is not normally covered. To fill this gap temporary base stations were installed between Salinas and Ventura. During the trip, which took about 9½ hours, the circuit was in nearly continuous use allowing State Department officials to continue contact with their respective offices.

The C. & P. Company of Maryland pressed three VHF radiotelephone units into service in the Thurmont-Frederick area to supplement existing land facilities at the Camp David meeting. Three transportable radio systems with ED type emergency equipment normally stationed at Baltimore, Hagerstown and Salisbury were brought to this area and activated to bridge a 15 mile path 24 hours in advance of the Camp David meeting. Two of the radio links were installed as manual-dial subscriber line circuits terminating in coin boxes at Camp David while the third was used to reinforce the master office trunk group to Frederick.

In addition, the Companies provided the usual television pickup and other facilities required at the numerous points visited by the Khrushchev party.

2. F.C.C. APPROVES ORDER DENYING BELL VHF FOR GREAT LAKES

On September 9, the F.C.C. formally approved an order which denies the applications of three Bell System Companies for additional VHF Maritime coast stations on the Great Lakes. This action officially finalizes the earlier announced decision of the Commission (RADIO NOTES, June 22, 1959) following many months of formal hearing and oral argument procedures.

This case was brought into being by construction permit applications filed by Bell Companies and subsequently opposed by two Great Lakes Maritime communications Companies. The Michigan, Ohio and Wisconsin Companies made applications to the Commission for nine additional VHF coast stations in September 1952. The objections were filed by the Lorain County Radio Corporation and Central Radio Telegraph Company.

The Commission's final ruling supports the initial decision of the Hearing Examiner and the recommendations of the F.C.C. staff. The conclusions reached were based on the opinion that the applicants had not met the burden of proof in showing a need for the proposed service.

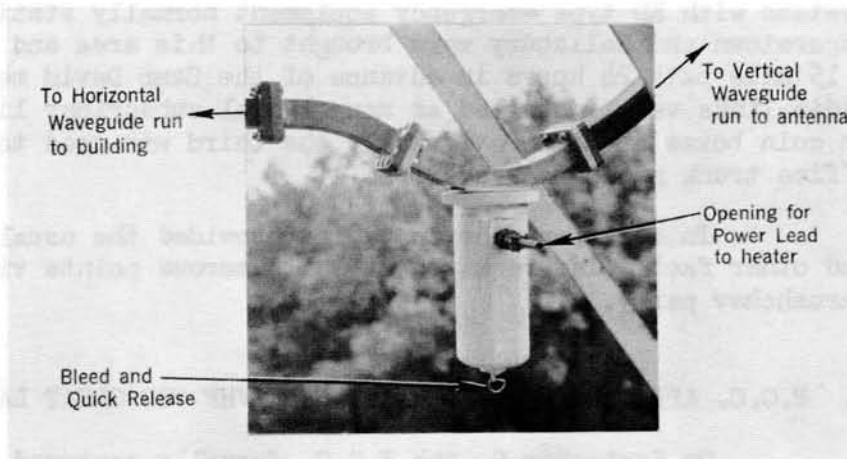
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3. I.T.U. PLENIPOTENTIARY CONFERENCE

At the Plenipotentiary Conference of the International Telecommunication Union (I.T.U.) scheduled to be held in Geneva, Switzerland October 14-December 17, the Bell System will be represented by Messrs. Ryan and Bemis. Fran Ryan is already in Geneva as a member of the U. S. Delegation to the International Radio Conference (RADIO NOTES, July 20, 1959) and Ed Bemis left New York on October 9. Ti Rogers, currently in Geneva, will return to "195" about November 1.

4. WAVEGUIDE WATER TRAP

The last issue of RADIO NOTES (September 22, 1959) included an item covering the trial installation of a water trap designed to remove water from TD-2 waveguide systems before transmission troubles developed. We believe this photograph will assist in visualizing this new device which was rather difficult to describe in the short paragraph of our last issue.



5. AID TO THE AILING PERISCOPE SYSTEM

Several cases of "long paths" have been reported recently during the alignment of periscope type microwave antenna systems. In conjunction with the missing db's there has, in general, been difficulty encountered in tying down on the major lobe. Reports indicate that in the place of a good major lobe, many very narrow minor lobes are encountered which may produce results of only a few db more than calculated path loss. Such a situation is indicative of misorientation of the antenna system and must be avoided.

The key to successful alignment of a periscope antenna system starts with having the major lobe of the dish well centered on the reflector. Otherwise the radiated pattern of the reflector will lack any semblance to its advertised pattern. Misorientation of the dish may result in misorientation of the reflector and simply cause a compounding of errors in the continued search for a stronger received signal.

Paragraph 5.01 of BSP Section R100.070 mentions one method of visually aiming the dish at the center of the reflector and there are undoubtedly many other such methods. The Michigan people, however, have brought a method to our attention which we feel is worth passing along. Their "trick" involves the use of a carpenter's square (24 inches on one side and 16 inches on the other) available at any hardware store. The square is used as a sighting device to align the dish to the center of the reflector. This is done by placing the inner edge of the long leg of the square across an arc of the under side of the rolled rim. While sighting along the outside edge of the short leg of the square, the dish can be adjusted until a slight movement of the square scribes a line across the center of the reflector. (Allowance can be made for the 12 inches or so of parallax involved.) It is necessary to sight at two points approximately 90 degrees apart to orient the dish in both planes.

With the visual sighting thus completed, field experience has indicated that orientation of the reflector may be undertaken with the assurance that a good alignment job can be done.

Possibly other antenna alignment methods have been used which might prove helpful to the rest of the Bell System. How about calling Bill Keller on EXeter 3-2120 if you have any thoughts on this subject.

6. BROADBAND RESEARCH

Although the outcome of the 25-890 mc hearings are not expected to be known for some time, the Laboratories have already done some research in laying the basic groundwork for building a 900 mc broadband system.

A highly instrumented mobile receiving station and a base transmitter have been assembled and used to learn more about mobile propagation in this high frequency range.

More importantly, extensive theoretical studies have been made which shed some light on what the basic layout of a broadband system should be. These show that both space and frequency separation of channels should be used to best accommodate heavy traffic in a metropolitan area. An interesting proposal which would accomplish this is to provide a large number of fixed transmitter-receivers, each with a talking range measured in terms of city blocks rather than miles. Present thoughts are that a group of these stations would be connected by wire or microwave to one of several control points located in different sections of the city. At these control points, high speed computer and switching equipment would automatically select, for each call, an idle channel on a frequency not subject to either co-channel or intermodulation interference in the particular situation. The control equipment would then operate a base-to-mobile data link to automatically tune the mobile station to the selected talking frequency, and would also activate the appropriate fixed station.

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Research on these sophisticated operating arrangements and on equipment and propagation aspects will be continued, in order to shorten the interval between F.C.C. approval, if granted, and inauguration of broadband service.

7. ALARM SIGNAL RULES ADOPTED FOR MARITIME RADIOTELEPHONY

The Federal Communications Commission recently approved amendments to parts 7 and 8 of their Rules for voluntary use of a radiotelephone alarm signal on the safety-calling frequency. These rule changes adopted by an Order in Docket 13082 will become effective October 26, 1959. They permit the transmission of the internationally recommended alarm signal prior to a distress call or message.

The adoption of a radiotelephone alarm signal has been under consideration for many years. From an international standpoint, it will be further explored at the Administrative Radio Conference now meeting in Geneva. This subject is also expected to get more attention during the Safety of Life at Sea Convention in London early next year.

By making the alarm signal on 2182 kc available on a voluntary basis, the Commission is encouraging its use in United States waters. The F.C.C. hopes early operating experience can be gained prior to adjournment of the two international conferences. This could be a source of valuable information and data for United States delegates attending these meetings.

We do not know yet how rapidly or in what areas this alarm signal usage will develop. As this becomes known, we shall send to the Companies the necessary engineering, traffic, plant, and equipment information for their public coast stations. Meantime, it is important that the Traffic and Plant operating people recognize the alarm signal as an alert for a distress message. P.E.L. 6554 provides advance information and transmits a copy of the Order under Docket 13082.

8. BOLTS LEFT INSIDE WAVEGUIDES

Many instances have been found where bolts or other foreign material have been left inside waveguides at the time of installation. (RADIO NOTES, May 18, 1959) Some of the bolts used to fasten the waveguide sections together have been shipped in small envelopes tucked inside the waveguide, where they are overlooked by the installer. Since such items may not cause much transmission loss, they often go unnoticed; however, they do result in envelope delay distortion. Investigation of excessive envelope delay distortion in TD-2 systems has turned up many cases of foreign matter in the waveguide runs.

The Western Electric Company has agreed to revise their packing procedures so that bolts will not be shipped inside waveguide sections or components. It would be a good idea, however, to bring this situation to the attention of installers so they will be on the lookout for foreign material left inside the waveguides.

9. MORE HELICOPTER USE

Good use of a helicopter was made for site selection and transporting path tests equipment on the Pacific Company TD-2 route between Rattlesnake Ledge and Sprague through the rugged Cascade Mountain Range in Washington. Field verification of possible sites were made using a chartered helicopter in areas where accessibility by vehicle or foot was impractical.

Selection of the repeater site at Hyak was made by mirror flashing to the helicopter from two adjacent sites. Final path testing at this location was performed using a helicopter to transport 200 feet of test tower, engine alternator, test equipment and personnel. 26 trips were required at about 15 minutes per round trip with 450 pounds payload per trip. The project was completed without incident, and the results were very satisfactory. The photograph shows the helicopter landing at Hyak with a cargo of tower parts.



Other areas have made considerable use of helicopters in site selection on new microwave routes.

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10. THREE CHANNEL VEHICULAR SYSTEM

On July 1, 1959 the Long Lines and the C. & P. of Washington commenced service on a three channel mobile radio system for a government application. About 75 cars, 5 base stations, 8 auxiliary receiving stations and 9 G-2 control terminals are currently in operation.

This system employs government frequencies in the area of 150 mc with three voice channels and a signaling channel applied to a broad band base transmitter, and three separate single channel frequency assignments in the car transmitters. Full duplex operation at the base station is provided to permit interconnection with the customers private line telephone network.

The base station and fully transistorized mobile channelizing equipment was especially developed and manufactured by Scantlin Electronics for this application. This equipment includes compandors in both directions of transmission, continuous "in-range" and "channel busy" indicators in the car with separate "call" lights for each incoming channel, and push-button controlled tones in the car to allow calling an alternate PBX operator and to provide a "priority" signal if required.

11. MORE TD-2

The Long Lines Department is planning to install three TD-2 channels from Paris Mountain, South Carolina (on the Washington-Atlanta route) to Allendale, South Carolina via Columbia for television service, as part of a program to release coaxial cables for telephone service. The first three hops, from Paris Mountain to Columbia, South Carolina, will utilize TD-2 stations already under construction for a Southern Bell route to Columbia. The remaining three hops from Columbia to Allendale will require construction of two intermediate repeaters. Allendale is an existing station on the Augusta-Charleston route. Total route miles from Paris Mountain to Allendale will be 173.5.

12. NEW SCHEME FOR ORIENTING HORN-REFLECTORS

Representatives of the Bell Laboratories and Long Lines Western Area have been conducting tests on the TD-2 route east of Salt Lake City in an effort to determine the best method of orienting horn-reflector antennas and systems combining networks. Delay lens antennas have been replaced with horn-reflector antennas on this route in preparation for installation of the first TH system.

By slightly modifying the original orientation procedure and by taking certain precautions against lateral motion of the antenna when it was adjusted in azimuth, very good results were obtained in most instances. In a typical case, when transmitting vertically polarized signals and receiving horizontally polarized, cross-polarization discrimination (XPD) was 39 db. Transmitting horizontally and receiving vertically, XPD was 41 db. With the original orientation procedure it had been possible to get 40 db or better on either polarization but the XPD on the other polarization would then be quite low, perhaps only 20 or 25 db.

A more complicated orientation procedure was found to be necessary in situations where reflections were received from the sides of hills or canyons. This procedure requires the simultaneous transmission and reception of both horizontally and vertically polarized test signals.

Details on both of these revised orientation methods will be available in B.S.P.'s at a future date. Both procedures, while satisfactory for new construction, have the disadvantage that they must be performed on an out-of-service basis. Consequently, the Laboratories people have under consideration certain variations in the procedures which will permit making routine checks of orientation on an in-service basis. It is proposed to test the in-service procedures in the field in the near future, with the cooperation of the Long Lines Department.

13. ORGANIZATION CHANGES

Effective October 1, 1959 Walter K. Mac Adam was appointed Assistant Chief Engineer succeeding Richard R. Hough who was elected a Vice President of the Ohio Bell Telephone Company.

Mr. Robert Bright, Acting Radio Engineer, has accepted a position as Executive Assistant in the Washington Office of the American Telephone and Telegraph Company effective October 15, 1959. In his new assignment, Bob will take over the work of Mr. R. H. Hartsough, Jr. who has been transferred to the Pacific Telephone and Telegraph Company as Assistant Vice President, California Administration. We wish Bob the best of success in his new position.

Barbara Wedin has joined the Point-to-Point Radio Engineer's group replacing Rosita Bilotti who commenced a leave of absence on October 18.

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14. RADIO INFORMATION

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

BSPM 685	-
BSPM 685A	-
BSPM 686	-
BSPM 686A	-
BSPM 687	R04.010, Issue 4 - General Safety Precautions Electronic Equipment
	R90.334.24, Issue 1 - TJ Radio System - Telephone With Diversity - Receiver Modulator Tests
	R90.334.25, Issue 1 - TJ Radio System - Receiver Tests and Adjustments - Receiver Component Replacement
	R90.334.32, Issue 1 - TJ Radio System - Tone Distribution Unit
	R90.334.40, Issue 1 - TJ Radio System - Telephone With Diversity - System Tests and Adjustments General
BSPM 687A	-
BSPM 688	A301.896, Issue 1 - J86487A Power Supply - +220V, +135V, -11V DC and 110V AC - TH Radio
	A301.897, Issue 1 - J86488A Power Supply - +450V, -170V and -11V Regulated DC - TH Radio
P.E.L. 6527	F.C.C. Rules - Amendment of Part 21 Making Available 942-952 Mc and 2110-2200 Mc Frequency Bands (1S4.1-213)
P.E.L. 6530	TD-2 Microwave System - Increasing Coupling Loss Between Parabolic Antennas (1S3.4-133)
P.E.L. 6526	TD-2 Microwave System - J68347A Visual Delay Set (1S3.7-99)
P.E.L. 6532	Petition for Reconsideration of Report and Order in Above 890 Mc Hearing (Docket 11866) (1S4.1-214)

P.E.L. 6541 Mobile Telephone Service - Frequency Modulated RF Signal Generators (1S3.7-98)

P.E.L. 6539 Mobile Telephone Service - Communications Products Company Vehicular Antennas and Mounts (1S3.4-131)

P.E.L. 7045 Motorola Microwave Component (1S3.9F-81)

P.E.L. 6540 TD-2 Microwave System - IF Amplitude Equalization for Television Circuits (1S3.6-76)

P.E.L. 6549 Radar Interference FPS - 24 and FPS - 26 (1S3.12-37)

P.E.L. 6550 TJ Radio System - Data on 10-foot Parabolic Antenna (1S3.4-134)

P.E.L. 6516 Mobile Telephone Systems - Static Resistant Antenna - 30-50 Mc - Communication Products Company (1S3.4-130)

P.E.L. 6537 Mobile Telephone Service - Secode Two-Tone Decoder (1S3.6-75)

P.E.M. 7036 Mobile Telephone Service - 4-125A Electron Tubes for Western Electric 540- and 541-Type Radio Transmitters (1S3.1-95)

P.E.M. 7059 Bellboy Personal Signaling Service - Special Arrangements for Switchboard Lamps (1S3.9M-6)

P.E.M. 7054 Microwave Systems - Lenkurt 74A Terminal - Possibility of Shock Hazard (1S3.9F-82)

Unnumbered Letter sent to Chief Engineers

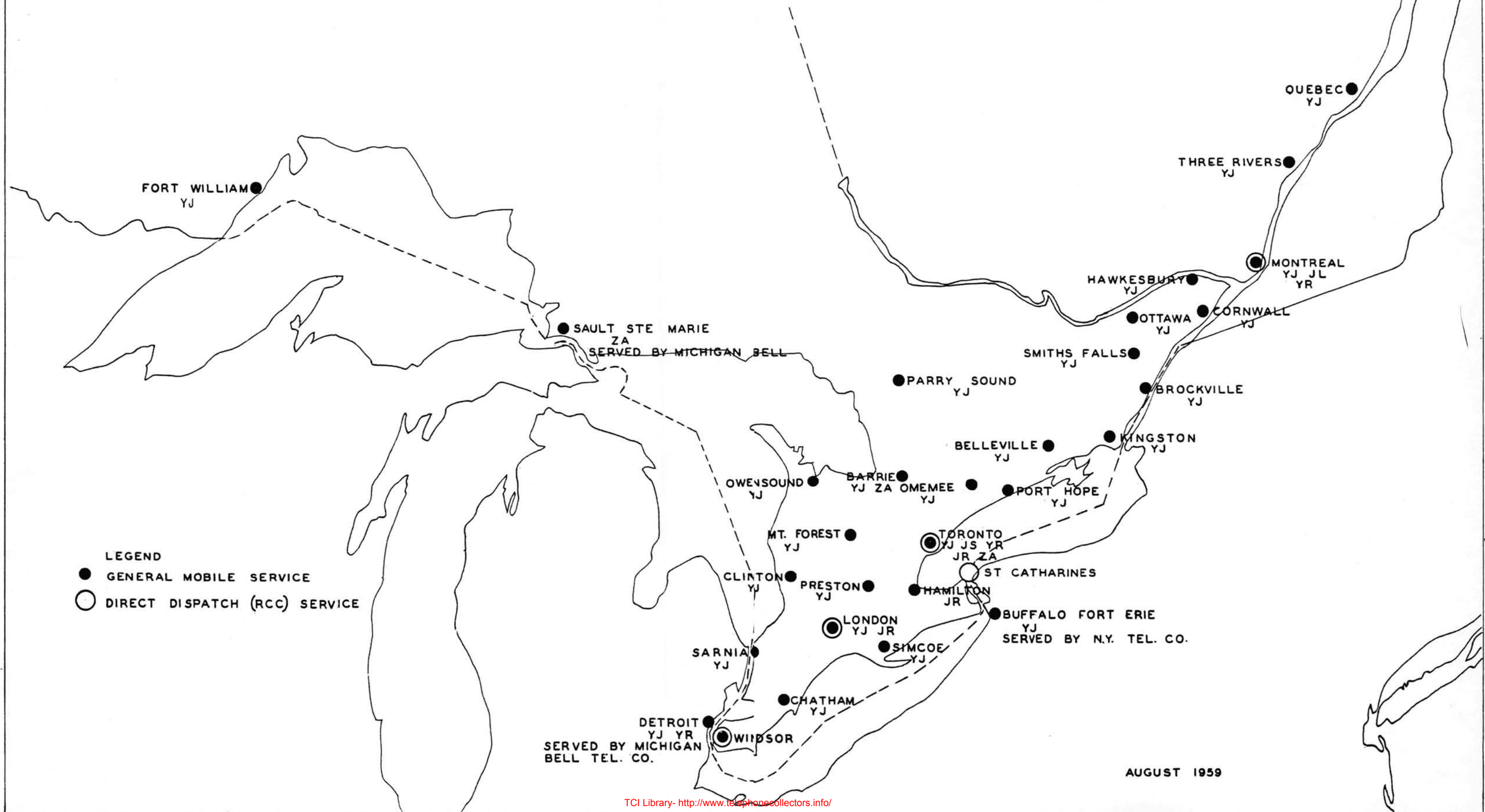
9-16-59 Mobile Telephone Service - Deviation Limiters for W.E. Co. 38 and 39-Type Transmitters (1S3.1-94)

Unnumbered Letter sent to Marketing Department

9-25-59 Bellboy Personal Signaling Service - Marketing Program (1S3.9M-7)

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MOBILE TELEPHONE SERVICE THE BELL TELEPHONE CO OF CANADA



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