



RADIO NOTES

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
OPERATION AND ENGINEERING DEPARTMENT

Volume 14, No. 2

February 13, 1959

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Attached - Tabulation of Mobile Service Areas and Channels

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1. CONNECTICUT TJ MICROWAVE CONSTRUCTION PROGRAM

Applications for construction permits have been filed with the FCC by the Southern New England Telephone Company for the first phase of a TJ construction program that envisions linking practically all the toll centers in Connecticut with microwave radio. The plan was formulated after the disastrous 1955 floods which wreaked havoc with cable plant in the river valley areas of Connecticut.

The initial construction applications cover a 7 hop TJ system due for completion in 1960, which will provide alternate intertoll telephone facilities along the Naugatuch River Valley in Western Connecticut; from New Haven on the south to Canaan on the north and sidelegs to Waterbury and Torrington. The terminal radio stations will be located directly in the central offices so that the new circuits will be free of any wire entrance facilities.

A passive repeater is planned in each of the two radio transmission paths feeding Canaan and Waterbury. Each passive repeater will employ two 10' x 10' reflecting surfaces located a short distance from one another for reflecting the microwave signal over the intervening high ground between the microwave "back-bone" route and the terminals at central office locations.

It is planned to channelize the system with ON2 carrier to provide the flexibility required for handling the small circuit groups in this system. While the main purpose of the system is to provide diversification of circuit facilities, it is planned that the system will also provide for future growth requirements along the route.

2. TRANSISTORIZED SELECTOR FOR MOBILE SERVICE

A new, completely transistorized selector has been approved for use in the Mobile Telephone Service. The new device, which is housed in the mobile unit junction box, is the Scantlin SEI-1315 Selector. It is essentially a small digital translator with no moving parts and will accommodate up to 59,000 individual five-digit codes. It replaces the electro-mechanical selectors now in use for 12-volt systems and while it is functionally compatible with these older selectors, it is radically different in design, operation and appearance. Information covering the new device has been included in P.E.L. 6388.

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3. RECEIVED SIGNAL LEVELS IN THE TJ RADIO SYSTEM

Tests of some of the first TJ installations indicated that received RF signal levels are higher than computed from information in P.E.L. 6023. Investigation of these discrepancies has disclosed that gains of the parabolic antennas are slightly greater than the published values and losses of some waveguide components are less than expected. Although information is not yet available to permit us to supplement the P.E.L., it appears that signals at the receiver converter can be expected to be 2 to 4 db higher than computed values with a corresponding improvement in fading margin. The signal at the "quick disconnect" flange, where it is normally measured, would be about 1 db higher than at the receiver converter.

4. FCC AMENDS RULES TO PROTECT RADIO ASTRONOMY OBSERVATORIES FROM RADIO INTERFERENCE

The FCC has recently amended its Rules for the purpose of providing radio interference protection at the National Radio Astronomy Observatory at Green Bank, West Virginia and the Naval Radio Research Observatory at Sugar Grove, West Virginia. These observatories require freedom from man-made interference. The State of West Virginia has enacted legislation to provide protection from electrical equipment interference.

The amended Rules require that applicants for new radio stations or modifications of existing stations operating within an area of about 50 miles of these observatories, coordinate their operations with the director of the National Radio Astronomy Observatory at Green Bank, West Virginia.

The FCC's Report and Order dealing with this matter pointed out that the new rules are not intended to restrict the development of radio services in the area or to require the FCC to accede to suggestions made by the observatory, but establish a means of limiting as much as possible radio interference to the observatories.

5. CIRCULAR WAVEGUIDE WITH DELAY LENS AND DISH ANTENNAS

A method has been devised by the Laboratories for the application of circular waveguide to feed delay lens or parabolic dish antennas on TD-2 microwave systems. At 4 kmc the attenuation in circular waveguide is less than 1/2 that of rectangular copper and less than 1/3 that of rectangular brass. Replacement of rectangular waveguide at stations with tall towers can result in considerable fading margin improvement. The Long Lines Department is planning several replacements of this type.

In this new application the antenna and its associated short section of rectangular waveguide is connected to the long vertical circular waveguide run by means of a rectangular-to-circular transducer. At the lower end of the circular waveguide run an 11A coupler is used for connection to the rectangular guide which runs between the tower base and microwave equipment inside the building. The 11A coupler is used instead of another transducer to minimize the undesirable distortion effects of a certain amount of mode conversion inherent to a two transducer system. Since the cost of converting to circular waveguide is quite high, the demand for this kind of installation is expected to be relatively low; consequently, no standard arrangements for this conversion are planned.

6. CHESAPEAKE BAY TJ GETS SERVICE AND RADAR OK

On February 1, 1959 the C. & P. Company of Virginia placed in service a new one hop TJ microwave system between Hampton and a military site (Radio Notes, June 17, 1958). The radio path is 23 miles in length 20 miles of which span the lower Chesapeake Bay. Antenna reflector combinations with 250 foot self supporting towers are used at the terminal sites which are only a few feet above sea level.

Even though located in the midst of a heavy concentration of mobile as well as fixed radars no potential interference was observed during extensive pre-service monitoring of the 10.7-11.7 kmc band except from one radar at the military site. Energy from this radar, a height finder, was detected in the receiving waveguide at the Hampton terminal only, fortunately not on the specific TJ frequencies being used. Additional tests at the radar fundamental frequency indicated it to be functioning improperly. Following replacement by the military of a worn out magnetron with subnormal output and a bad pulse shape, waveguide output tests over the complete band at both ends of the TJ path revealed no interfering signal. The sensitivity of the test receiver was -60 dbm.

Other calculations based on detected radar energy somewhat outside the 10.7-11.7 kmc band and arriving at about right angles to the desired path indicated that the discrimination of this dish-reflector system was around 50 db. Although this is considerably above the 25 db discrimination normally used in preparing TJ interference estimates, general use of a higher discrimination figure is not thought to be justified at this time.

Recording instruments are being installed on this system to observe the 11 kmc signal levels on this long over water path. The system carries 36 circuits of Lenkurt 45BX, a number of which are used for SAGE data transmission. During SAGE data transmission tests, no errors were caused by operation of the diversity switch when simulated fades were introduced.

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7. SAGE DATA TESTS

The Bell Laboratories and the Long Lines Department are planning to collaborate in making SAGE data tests on TD-2 facilities, starting about the first week in February. It is proposed to test not only SAGE loading and resultant cross-modulation noise on telephone circuits but also the effect of noise and hits on SAGE error rate for several different levels of transmission. The tests will run at least three weeks and possibly longer. Start of the testing work was scheduled for the first of the year but was postponed to permit completion of similar tests begun earlier on L3 facilities.

8. DAMAGE TO RETURNED EQUIPMENT

The Quality Assurance people in the Laboratories have been handicapped in their efforts to determine the cause of field troubles with items returned on engineering complaints because of damage incurred during return shipment. This has been particularly true in the return of 223 type coaxial switches used in TD-2 switching applications. Some of these switches have been received with broken or bent front panel or rear terminal plates while others show internal damage such as one or more broken mercury switch elements. Since difficulties of this general type would have prevented the switch from functioning under normal service conditions, it has been concluded that the main damage was done after removal from service. Inadequate packing for shipment appears to be the principal cause of this difficulty.

Similar complaints have been received by manufacturers of radio and carrier units returned for repair or replacement. It is desirable to return equipment in the original shipping carton where available. In all cases adequate cushioning between the returned unit and the package walls should be provided.

9. TD-2 AUTOMATIC SWITCHING TIMER

A field trial of the new TD-2 automatic switch timing test set has recently been completed (Radio Notes October 17, 1958). Field comments on the use of the timer indicate satisfactory operation.

The timer is a decade counting device which will measure the overall operating time of a switching section or the operating time of the individual units which make up the switching section. It is expected that the timer can be used for routine tests of switch operation, making it possible to increase the maintenance interval on some present routines. The current view is that the timers will be used at each switching point. Cost of each test set is expected to be in the \$700 range.

10. IMPROVED MICROWAVE GENERATOR FOR TD-2

The design of an improved microwave generator for TD-2 has just been completed by the Laboratories and the first production unit is expected to be delivered by Western Electric about January 1960. Technical details and ordering information will be furnished in a forthcoming P.E.L. The new design eliminates tube types which had a short service life and certain condensers which were a prolific source of "hits." Tuning is made simpler and easier through the use of new cavities. The redesigned microwave generator will be designated J68330G, Group 3. It is anticipated that ultimately the Companies will replace all microwave generators in the field which are Group 2 or earlier design, in order to minimize "hits," reduce maintenance and improve the reliability of TD-2 facilities.

11. MOBILE SERVICE AREAS AND CHANNELS

The attached tabulation which shows the mobile service areas and channels in service January 1, 1959 replaces the list forwarded with RADIO NOTES dated February 25, 1957. The current list includes additional service areas in Independent Telephone Company territories on which information recently became available.

To make this list of maximum value to those who find it useful it would be appreciated if omissions and corrections are called to our attention.

Service on the YJ channel became available at Chualar, California on January 20, 1959.

12. ORGANIZATION CHANGE

Mr. Leslie Sparks returned to Birmingham, Alabama, on February 1, 1959, to resume his duties with the Southern Bell Telephone and Telegraph Company. Les was temporarily assigned to the Mobile Radio Group of the Radio Section since January 6, 1958, and was principally concerned with preparing Bell System Practices covering the operation and maintenance of mobile radio equipment.

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13. RADIO INFORMATION

The following have been forwarded since the last issue of Radio Notes:

- BSPM 652 R90.334.13, Issue 1 - TJ Radio - Transmitter Tests and Adjustments - Transmitter Linearity
- R90.334.23, Issue 1 - TJ Radio - Telephone with Diversity - Receiver Linearity
- AB27.340.1, Issue 1 - Mobile Telephone Systems - Delay Equalization of Channels Provided for Multistation Radio Systems
- AB27.340.2, Issue 1 - Mobile Telephone Systems - Delay Equalization Equipment
- BSPM 652A -
- BSPM 653 R40.453.00, Issue 1 - KS-15676 Horn-Reflector Antenna and Associated Waveguide System (Maintenance Routines)
- R40.454.00, Issue 1 - KS-15676 Horn-Reflector Antenna and Associated Waveguide System (Maintenance Methods)
- R40.454.11, Issue 1 - - - Horn-Reflector Assembly
- R40.454.12, Issue 1 - - - Weather Cover
- R40.454.13, Issue 1 - - - Feed Horn, Mounting Base and Frame, Flexible Waveguide
- R40.454.14, Issue 1 - - - Rigid Waveguide and Restrainers
- R40.454.15, Issue 1 - - - Square Restrainer, Hood, Compensator, Transducer, and 11A Directional Coupler
- R40.483.00, Issue 1 - KS-16320 Passive Reflectors - General
- R40.484.00, Issue 1 - KS-16320 Passive Reflectors - General

	R40.484.10, Issue 1 - - - Procedures
	R40.484.15, Issue 1 - - - Azimuth Adjustment
	R40.484.16, Issue 1 - - - Elevation Adjustment
	R40.484.17, Issue 1 - - - Curvature Adjustment of List 2 Reflectors
	R40.484.18, Issue 1 - - - Final Adjustment
	AA646.893, Issue 1 - Performance Requirements - TH Radio Tube Cooling System - Power Systems
BSPM 653A	-
BSPM 654	R90.330.00, Issue 1 - TJ Radio System
BSPM 655	AA268.545, Issue 2 - Test Sets - Transmission Measuring - Systems (5A Noise Weighting Set for VTVM Measurements on Microwave Systems)
P.E.L. 6394	FCC Rules and Regulations - Amendment of Parts 10, 11 and 16 to Change the Effective Date of Narrow-Band Technical Standards in the 25-50 and 152-162 mc Bands (Docket No. 12295) (1S4.1-199)
P.E.L. 6393	Direct Dispatch Service - General Description (1S3.9N-1)
P.E.L. 6384	Mobile Radio Systems - Erco Laboratories, AM - UHF Radio Equipment for SAC Bombardment Wing Flight Control Centers (1S3.11F-1)
P.E.L. 6388	Mobile Telephone Service - Transistorized Selector (1S3.6-68)
P.E.L. 6407	FCC Rules and Regulations Published by Pike and Fischer (1S4.1-200)
P.E.M. 6822	Mobile Telephone Service - Test Set for Transistorized Selector (1S3.7-96)
P.E.M. 6850	Maritime Mobile Telephone Service - Coast Guard Watch on 2182 kc (1S2.11D-5)

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Unnumbered Letter to Transmission Engineers

1-7-59 Radar Interference to Microwave Radio System (1S3.12-32)

Unnumbered Letter to Certain Chief Engineers

1-12-59 Non-Type Accepted Microwave Equipment (1S4.1-198)

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Maine</u>																
Augusta			X													
Bangor			X													
Houlton			X													
Lewiston		X														
Portland			X													
Presque Isle		X														
Rockland		X														
<u>Massachusetts</u>																
Boston	X		X		X		X								X	
Framingham				X												
Lawrence		X														
Pittsfield			X													
Springfield			X													
Worcester			X													
<u>New Hampshire</u>																
Dover		X														
Manchester			X													
<u>Rhode Island</u>																
Providence	X		X				X									
<u>Vermont</u>																
Burlington		X														
<u>Connecticut</u>																
Bridgeport	X															
Hartford	X															
New Haven			X				X									
New London							X									
Stamford ##																
Waterbury					X											
<u>New York</u>																
Albany							X									
Buffalo			X				X		X							
*Johnstown							X									
New York #	X	X	X	X			X							X	X	X
Poughkeepsie							X									
Rochester							X									
Syracuse							X									
Utica							X									
<u>New Jersey</u>																
Atlantic City														X		
New Brunswick							X									
Newark					X	X										
Trenton							X									

* Independent Connecting Company

QB, QF, QH and QL Channels in Service

QA Channel in Service

TCL Library- <http://www.telephon collectors.info/>

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Delaware</u> Wilmington							x									
<u>Pennsylvania</u> Allentown		x														
*Erie			x													
Harrisburg			x													
Lancaster		x														
Philadelphia	x		x	x	x	x	x								x	
Pittsburgh	x		x		x		x		x							
Reading			x													
Wilkes B - Scr.			x													
Uniontown														x		
<u>Dist. of Col.</u> Washington	x		x		x	x	x									
<u>Maryland</u> Baltimore			x		x		x								x	
<u>Virginia</u> Norfolk	x		x												x	
Richmond	x		x													
Roanoke			x													
<u>Alabama</u> Birmingham			x		x											
Huntsville			x													
Mobile					x										x*	
*Foley			x													
Montgomery			x													
Sheffield			x													
<u>Florida</u> Ft. Lauderdale				x		x										
*Ft. Myers			x													
Ft. Pierce			x													
Homestead						x										
Jacksonville			x													
*Lakeland						x										
Melbourne				x												
Miami	x	x	x		x											
Orlando	x		x													
Panama City															x	
Pensacola															x	
*Tampa			x													
West Palm Beach	x		x													
Cocoa		x														

* Independent Connecting Company

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Georgia</u>																
Atlanta	x		x		x											
Augusta	x															
Columbus			x													
Macon			x													
Savannah			x													
<u>Kentucky</u>																
Louisville	x		x						x							
Morganfield	x															
<u>Louisiana</u>																
Abbeville		x													x	
Baton Rouge	x		x												x	
Franklin			x													
*Golden Meadow			x													
*Grand Isle															x	
Houma		x			x											
Jennings			x	x												
Lafayette	x			x	x											
Lake Charles	x	x			x										x	
Morgan City															x	
New Orleans	x		x												x	x
Port Sulphur		x														
Shreveport	x		x					x								
<u>Mississippi</u>																
Gulfport															x	
Jackson			x													
Natchez	x				x											
<u>North Carolina</u>																
Charlotte			x													
*Fayetteville	x															
Greensboro			x													
Raleigh			x													
*Rocky Mount	x															
Winston Salem	x															
<u>South Carolina</u>																
Charleston			x													
Columbia	x				x											
Greenville	x				x											
*Greenwood			x													
*Verdery								x								
*Kingstree								x								

* Independent Connecting Company

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Tennessee</u>																
Chattanooga	X		X													
Knoxville			X													
Memphis	X		X												X*	
Nashville	X		X													
<u>Ohio</u>																
Akron						X								X		
*Bellefontaine			X													
Canton	X															
Cincinnati	X		X		X				X							
Cleveland #	X	X	X	X	X				X							
Columbus	X		X						X							
Dayton		X		X												
*Geneva									X						X	
Ironton									X							
*Lima			X													
*Lorain						X			X						X	
Mansfield									X							
Steubenville														X		
Toledo		X		X					X							
Youngstown			X						X							
<u>Michigan</u>																
Benton Harbor									X							
Detroit	X	X	X	X	X	X			X					X	X	
Flint									X							
Grand Rapids									X							
Jackson									X							
Kalamazoo									X							
Lansing									X							
*Muskegon									X							
Port Huron									X							
Saginaw									X							
Sault St. Marie									X						X	
<u>Indiana</u>																
Anderson	X															
*Elkhart									X							
Evansville			X						X							
*Fort Wayne			X						X							
Indianapolis			X	X	X				X							
Kokomo			X													
*Lafayette									X							
Marion					X											
Muncie			X													
New Harmony					X											
Rockport					X											
Vincennes			X													

* Independent Connecting Company
QH Channel in Service

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Wisconsin</u>																
Appleton						x										
Eau Claire									x							
Green Bay			x						x							
Janesville						x										
Lake Geneva									x							
Madison			x						x							
Manitowoc	x															
Milwaukee	x	x	x						x					x		
Oshkosh			x						x							
Racine						x										
Sheboygan									x							
Waukesha					x											
Wausau									x							
*Port Washington															x	
<u>Illinois</u>																
Beardstown									x							
*Casey					x											
Centralia					x				x							
Champaign									x							
Chicago #	x	x	x	x	x	x			x					x	x	x
Clay City	x															
Danville									x							
Decatur									x							
Effingham			x													
Kankakee									x							
McLeansboro			x													
Ottawa									x							
Peoria									x							
Quincy									x							
Rockford									x							
Rock Island									x							
Springfield									x							
<u>Iowa</u>																
Des Moines			x													
*Jefferson										x						
*Knoxville			x													
*West Branch										x						
<u>Minnesota</u>																
Duluth									x						x*	
*Ely										x						
Fergus Falls										x						
*Mankato										x						
Minneapolis			x		x				x							
*Two Harbors										x						
*International Falls										x						

* Independent Connecting Company

CA, CB, CF, CH and CL Channels in Service.

TCR Library <http://www.telephonerecollectors.info/>

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Nebraska</u>																
Kimball		x	x													
*Lincoln			x													
Omaha			x		x											
Sidney					x											
<u>North Dakota</u>																
Tioga			x													
Williston			x													
<u>Arkansas</u>																
El Dorado											x					
Hope											x					
Little Rock											x					
Newport											x					
<u>Kansas</u>																
Emporia											x					
Great Bend			x								x					
Hays			x								x					
Salina											x					
Topeka											x					
Wichita			x								x					
<u>Missouri</u>																
Fulton											x					
Joplin											x					
Kansas City	x		x		x						x					
Poplar Bluff											x					
St. Joseph			x													
St. Louis	x		x		x	x			x		x				x*	
Sedalia											x					
Sikeston											x					
Springfield											x					
<u>Oklahoma</u>																
Ardmore			x								x					
Elk City											x					
Enid											x					
Lawton											x					
McAlester											x					
Oklahoma City			x								x					
Tulsa			x								x					

* Independent Connecting Company

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Texas</u>																
Abilene			X								X					
Amarillo			X													
Austin											X					
Bay City			X													
Beaumont			X								X					
Beeville											X					
Big Spring			X								X					
Buffalo											X					
Corpus Christi	X		X								X					
Corsicana											X					
Dallas			X		X						X					
Denison			X													
*Dumas					X											
El Paso												X				
Fort Worth	X															
Gainesville					X											
Galveston											X				X	
Graham					X											
Greenville											X					
Harlingen			X													
Houston	X		X								X				X	
Huntsville											X					
Laredo			X													
Longview											X					
Lubbock			X													
McAllen			X								X					
McCombs			X													
Midkiff			X													
Midland			X													
Odessa			X								X					
Pecos			X													
Port Arthur															X	
Ranger											X					
San Antonio											X					
Seminole																
Skellytown			X													
Snyder			X													
Stamford			X													
Sweetwater			X													
Temple											X					
Victoria			X													
Waco											X					
Wichita Falls			X								X					
<u>Arizona</u>																
Phoenix	X	X	X		X	X						X				
Tucson			X		X							X				
Yuma					X											

* Independent Connecting Company

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Colorado</u>																
Alamosa																
Colorado Spgs.			x													
Boulder		x														
Cortez			x													
Denver			x	x	x	x						x				
Fort Morgan		x	x													
Grand Junction					x											
Greeley					x											
LaJunta																
Pueblo					x											
Rangely					x											
Sterling				x	x											
<u>Montana</u>																
Baker					x											
Billings				x												
Culbertson					x											
Glendive			x	x												
Great Falls					x											
Cut Bank				x												
Miles City				x												
Wolf Point			x													
<u>New Mexico</u>																
Albuquerque												x				
Farmington					x							x				
*Hobbs			x								x					
<u>Utah</u>																
Salt Lake City			x													
Vernal			x													
*Moab												x				
*Monticello												x				
<u>Wyoming</u>																
Casper			x		x											
Cheyenne				x												
Cody			x													
Gillette				x												
Newcastle			x													
Riverton				x												
Worland					x											
<u>Idaho</u>																
Lewiston													x			
<u>Washington</u>																
Bellingham													x		x	
Cle Elum													x			

* Independent Connecting Company

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>Washington (Cont.)</u>																
Ephrata													x			
Longview		x														
Okanogan													x			
Olympia													x			
Pasco													x			
Port Townsend																x
Seattle	x		x			x							x		x	
Spokane			x										x			
Tacoma		x														x
Walla Walla													x			
Yakima													x			
<u>Oregon</u>																
Astoria															x	
Bend													x			
Eugene			x										x			
Florence			x													
Grants Pass		x														
Klamath Falls		x														
Medford	x		x													
Newport		x														
*Ontario			x													
Pendleton			x													
Portland	x		x		x								x		x	
Roseburg		x											x			
Salem		x											x			
The Dalles			x													
*Coos Bay		x		x												
<u>Nevada</u>																
Reno			x													
*Las Vegas	x															
<u>California</u>																
Bakersfield			x									x				
Chico			x													
Eureka			x													
Fresno	x											x				
Imperial			x									x				
Lebec												x				
*Long Beach					x											
Los Angeles #	x	x	x	x		x						x				
Marysville		x														
Merced																
Modesto												x				
Oakland					x	x						x				
Palmdale			x													
Redding		x														
* Independent Connecting Company																
# 10A, 10B, 10H and 10M Channels in Service																

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
<u>California (Cont.)</u>																
Sacramento	x		x									x				
Salinas												x				
San Diego	x		x									x				x
San Francisco	x		x												x	
San Jose		x														
San Pedro															x	
Santa Rosa		x														
Stockton		x														
*Taft												x				
Ukiah			x													
Ventura	x		x									x				
<u>Canada</u>																
<u>Province of Ont.</u>																
Barrie			x						x							
Belleville			x													
Brockville			x													
Chatham			x													
Clinton			x													
Cornwall			x													
Fort William			x													
Hamilton						x										
Hawkesbury			x													
Kingston			x													
Lion's Head			x													
London			x			x										
Mount Forest			x													
Onemee			x													
Ottawa			x													
Owen Sound			x													
Parry Sound			x													
Port Hope			x													
Preston			x													
Sarnia			x													
Simcoe			x													
Smiths Falls			x													
Toronto	x		x	x	x				x							
<u>Province of Quebec</u>																
Montreal	x		x		x											
Quebec City			x													
Three Rivers			x													

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
Areas and Channels in Canada Operated by Telephone Companies Other Than The Bell Tel. Co. of Canada																
<u>Province of</u> <u>New Brunswick</u>																
Fredericton				X												
Moncton				X												
Saint John				X												
<u>Province of</u> <u>Ontario</u>																
Timmons				X												
<u>Province of</u> <u>Manitoba</u>																
Virden				X												
Winnipeg				X												
<u>Province of</u> <u>Saskatchewan</u>																
Oxbow				X												
<u>Province of</u> <u>Alberta</u>																
øBeaverlodge				X												
øBrooks				X												
øCalgary	X			X												
øCavendish				X												
øConsort				X												
øDrayton Valley	X			X												
øEdmonton	X			X												
øEdson				X												
øGleichen				X												
øLethbridge				X												
øMedicine Hat				X												
øNanton				X												
øOlds				X												
øPeace River				X												
øPincher Creek				X												
øRed Deer				X												
øRocky Mt. House				X												
øStettler				X												
øValley View				X												
øWetaskiwin				X												
øWhite Court				X												
øMarten Mtn.				X												
øRed Earth	X															

ø "Voice Calling" method of signaling employed.

Mobile Service Areas and Channels

Mobile Service Area	Channels															
	152-162 mc						30-44 mc								VHF Mar	
	JL	JP	YJ	JS	YR	JR	ZL	ZH	ZA	ZB	ZF	ZM	ZO	ZR	XY	XJ
Province of British Columbia																
øCampbell River				x												
øClinton				x												
øKamloops			x													
øPrince George			x	x												
øSquamish			x													
øSumás				x												
Vancouver	x	x	x	x												

ø "Voice Calling" method of signaling employed.