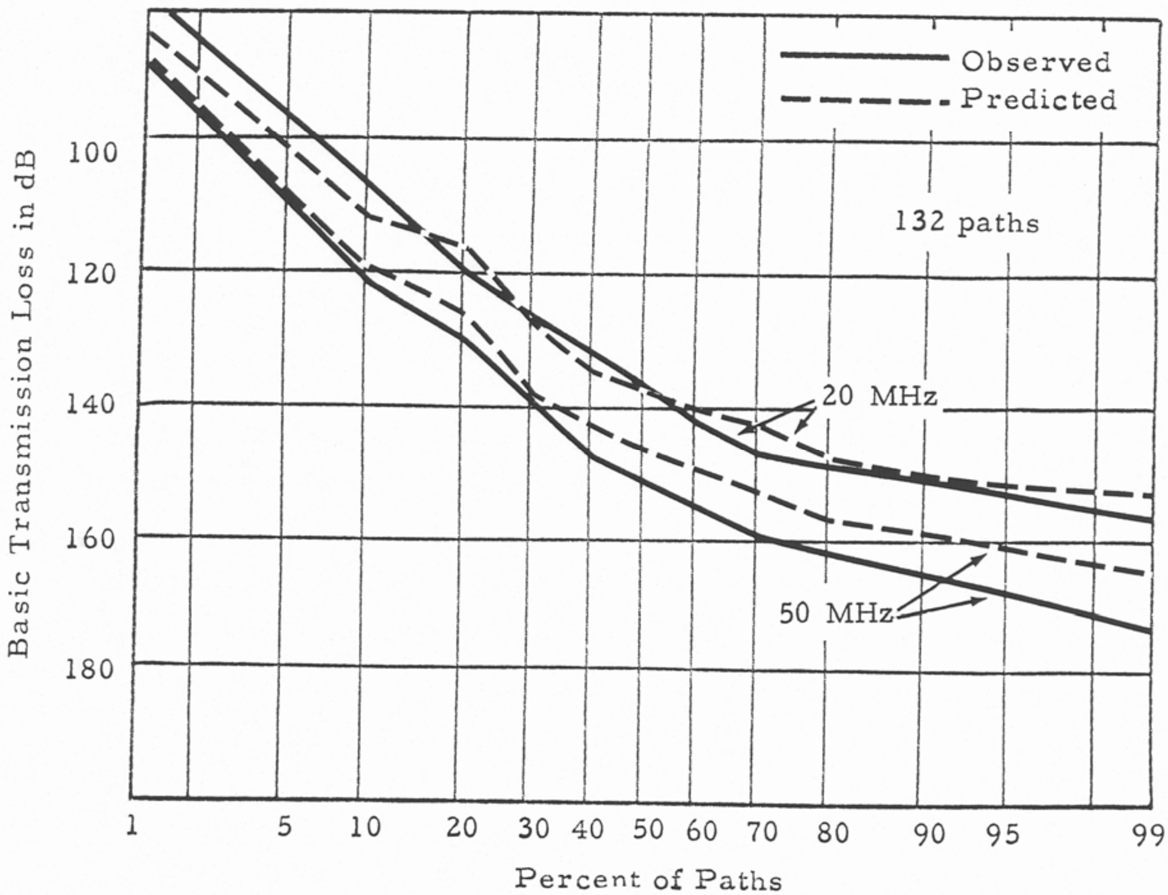
Table 6. Cumulative Distributions of Path Parameters, N.E. Ohio, 255 Paths

Parameter	Min	10	20	30	40	50	60	70	80	90
					Percentage					
				100 MHz, h_{g1}=4 m, h_{g2}=3 m						
d	9.8	10.0	19.9	20.0	29.8	30.0	30.2	50.0	50.1	50.3
Δh	15.7	50.5	63.8	77.0	85.9	94.7	107.3	124.8	143.8	169.8
d_{L1}	0.5	1.5	2.5	4.0	4.5	5.0	8.5	14.7	20.5	25.0
d_{L2}	0.5	0.5	1.0	1.0	2.0	3.0	4.5	6.3	11.0	16.2
d_L	1.0	4.0	5.5	7.0	10.0	15.0	19.1	23.3	28.1	34.6
θ_e	-3.3	0.1	3.2	5.3	7.1	8.8	10.8	13.4	19.0	31.3
				22 line-of-sight, 25 1-horizon paths						
				50 MHz, h_{g1}=4.2 m, h_{g2}=1 m						
d_L	1.0	4.0	5.5	6.5	9.9	15.0	19.1	22.9	26.8	33.9
θ_e	-2.9	0.1	3.7	5.6	7.5	9.6	11.9	14.8	19.8	32.8
				17 line-of-sight, 25 1-horizon paths						
				20 MHz, h_{g1}=3.7 m, h_{g2}=3 m						
d_L	1.0	4.0	5.2	6.7	10.0	15.0	19.1	23.2	27.9	34.6
θ_e	-3.3	0.1	3.2	5.4	7.2	8.8	10.9	13.5	19.2	31.3



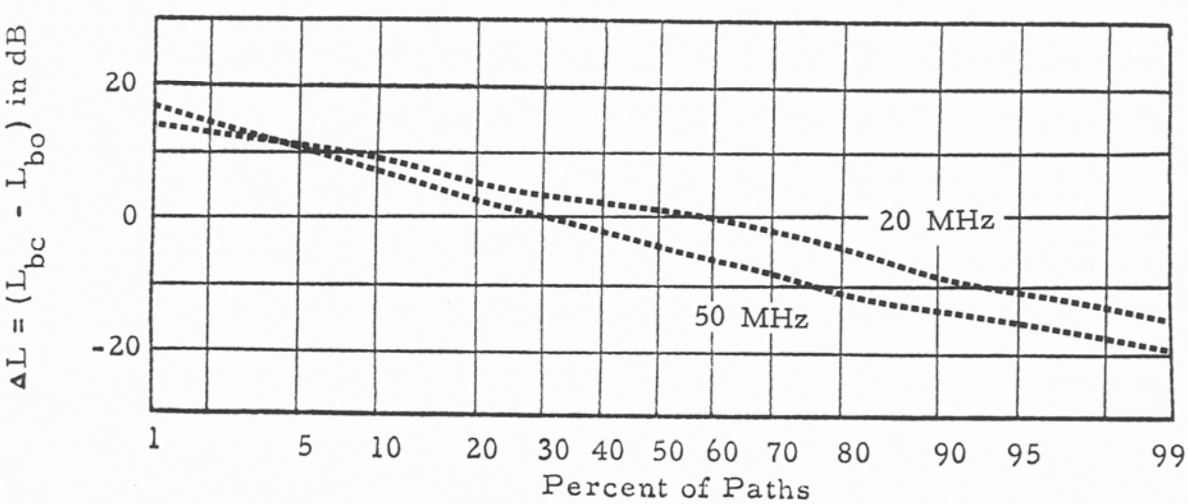
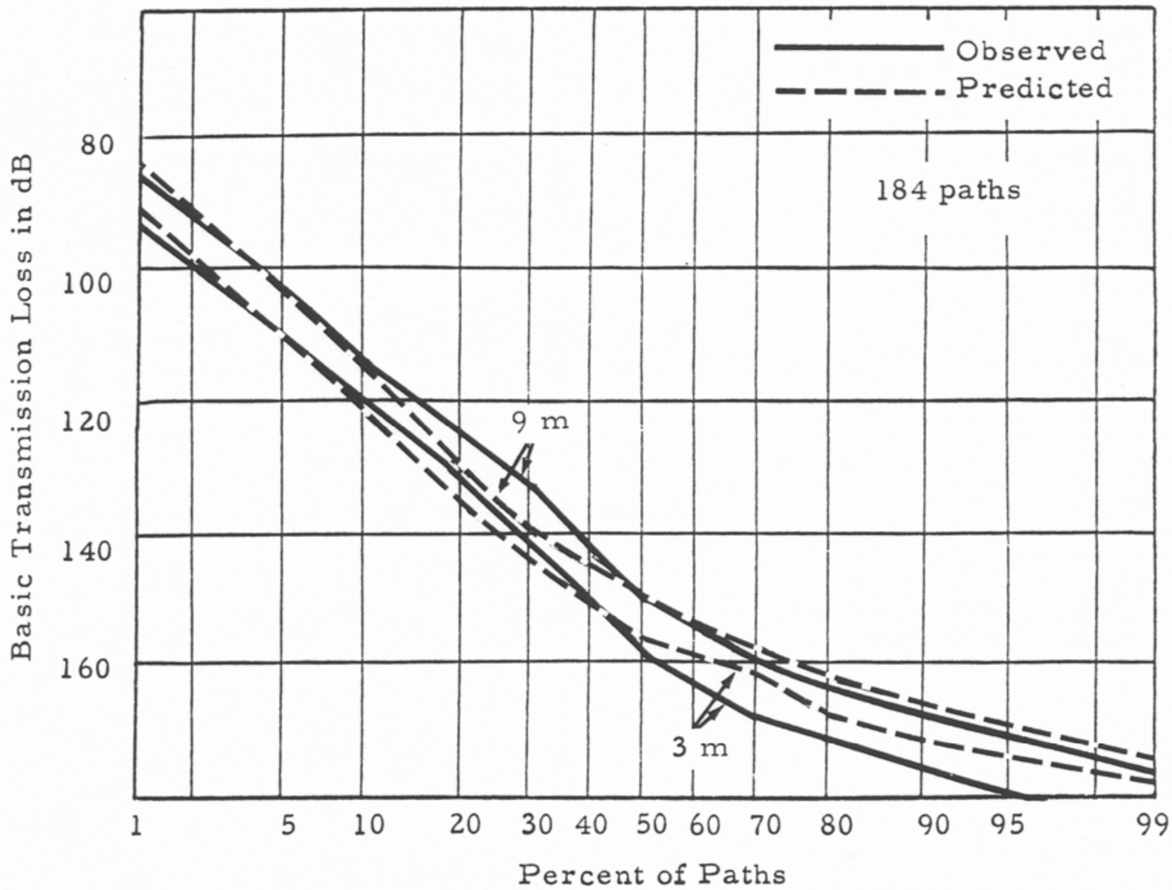


Figure 48. Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, Colorado plains, medians Δh=95 m, f=20 and 50 MHz.



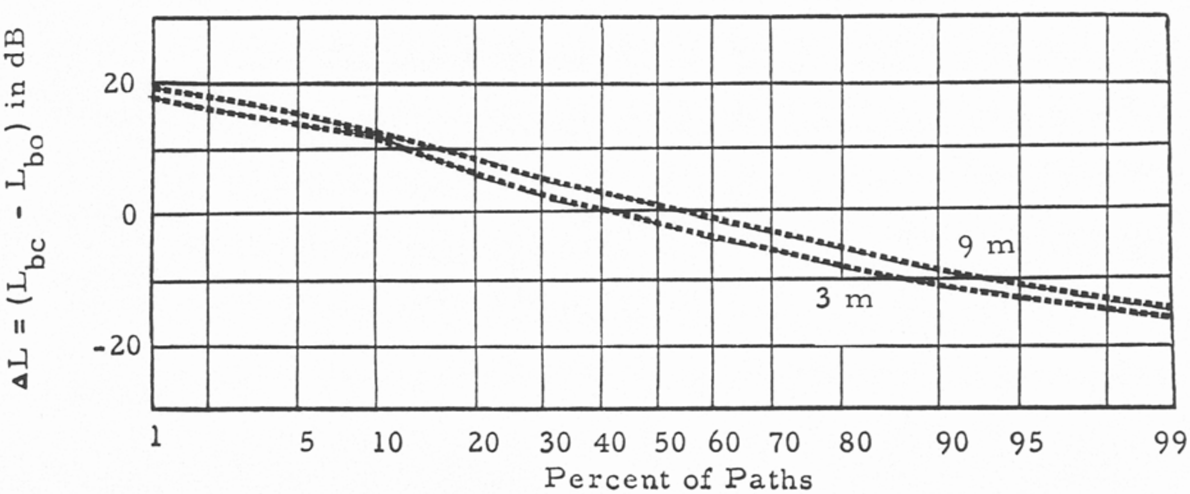
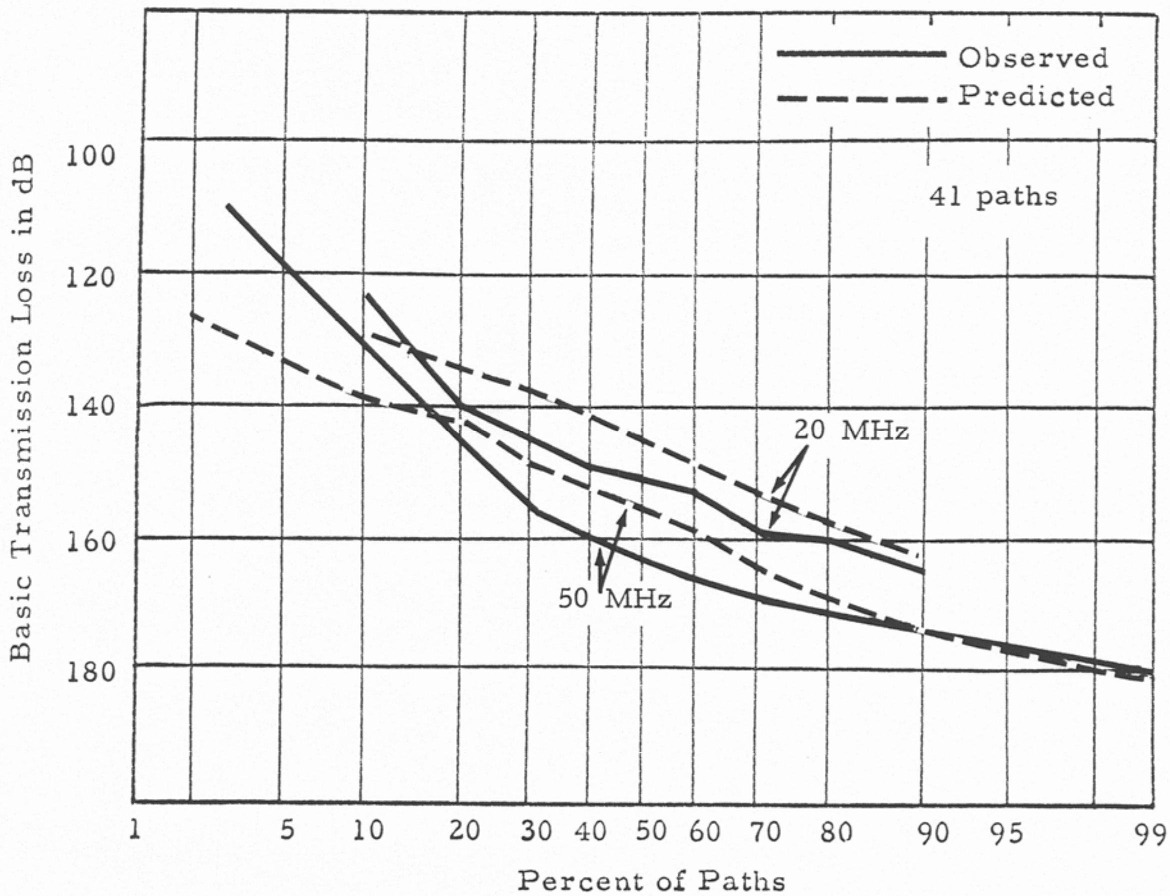


Figure 49. Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, Colorado plains, median Δh=95 m, f=100 MHz.



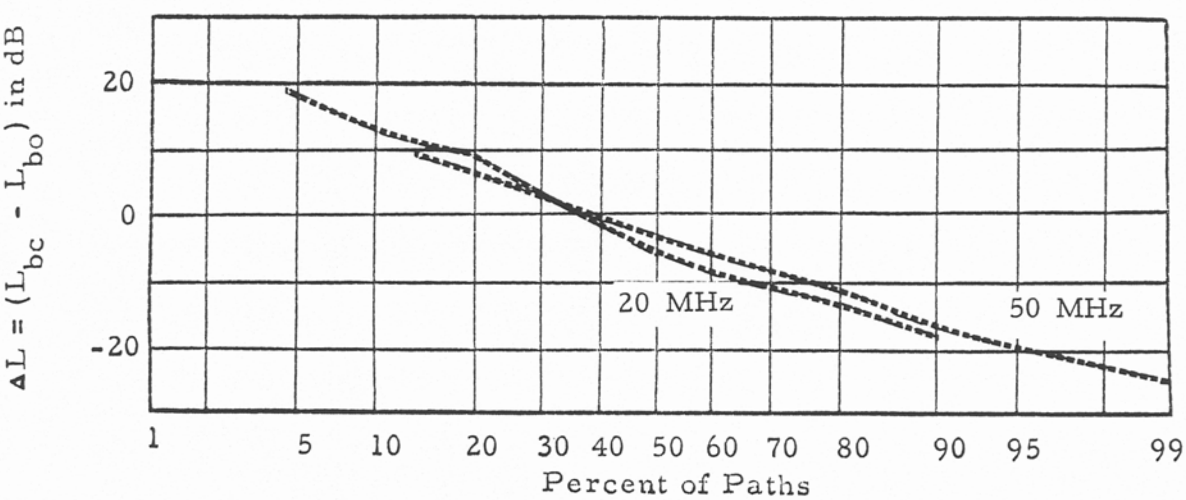
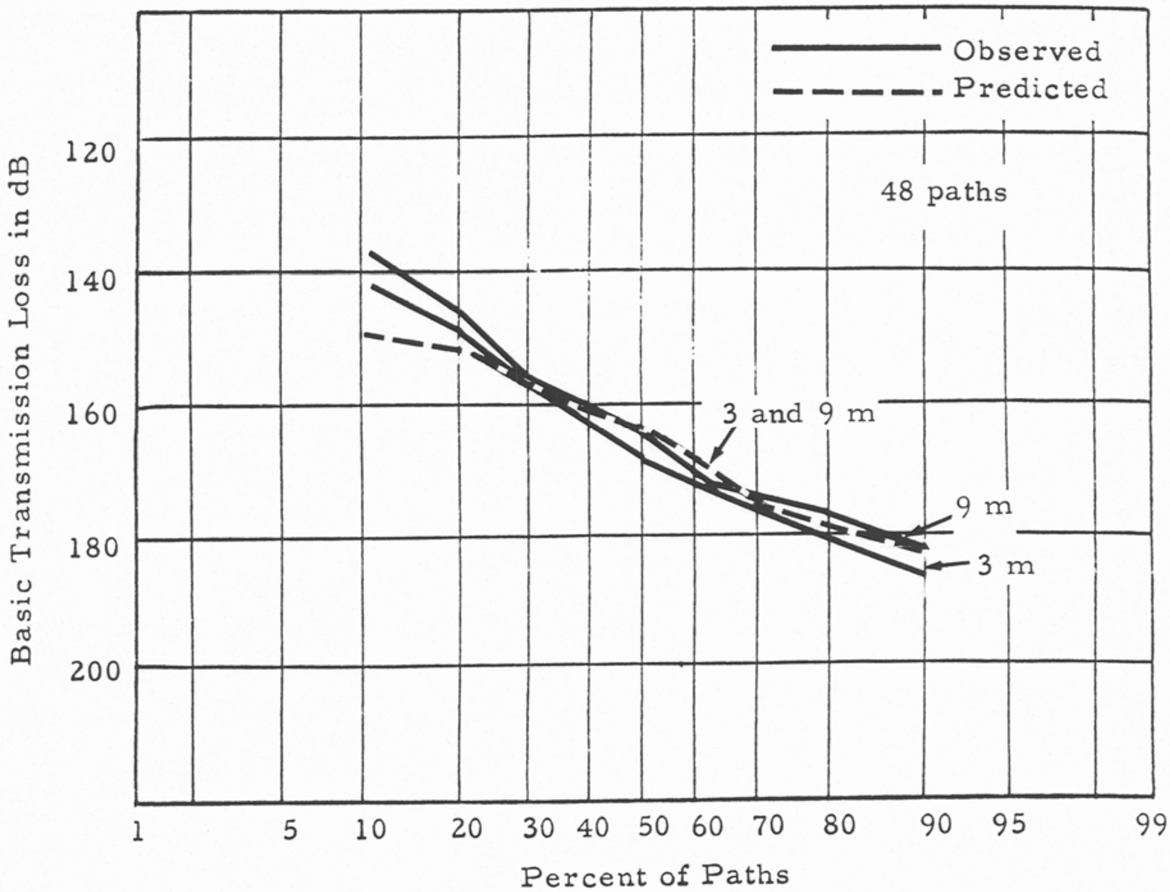


Figure 50. Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, Colorado mountains, median Δh=580 m, f=50 and 20 MHz.



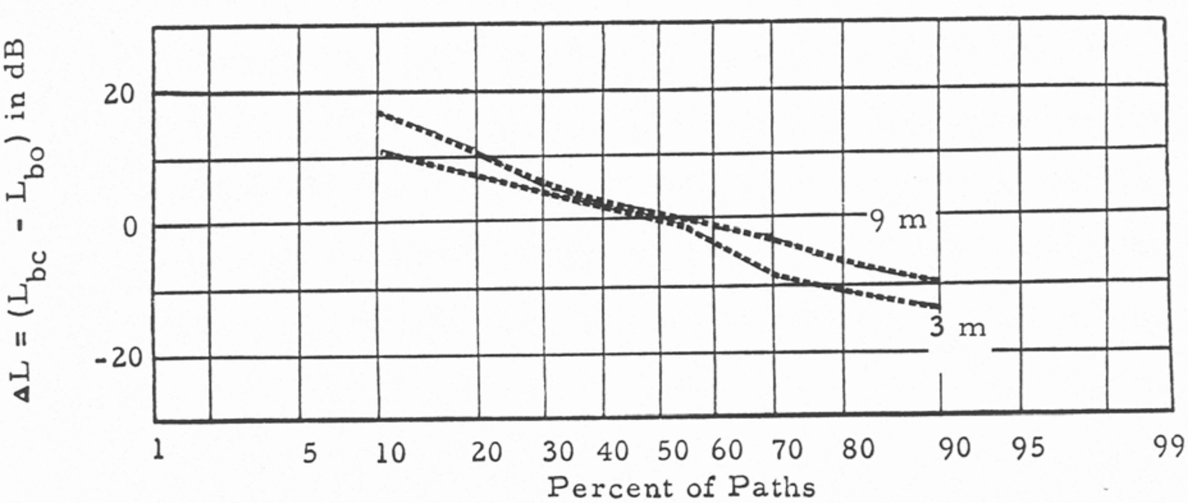


Figure 51. Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, Colorado mountains, median Δh=580 m, f=100 MHz.

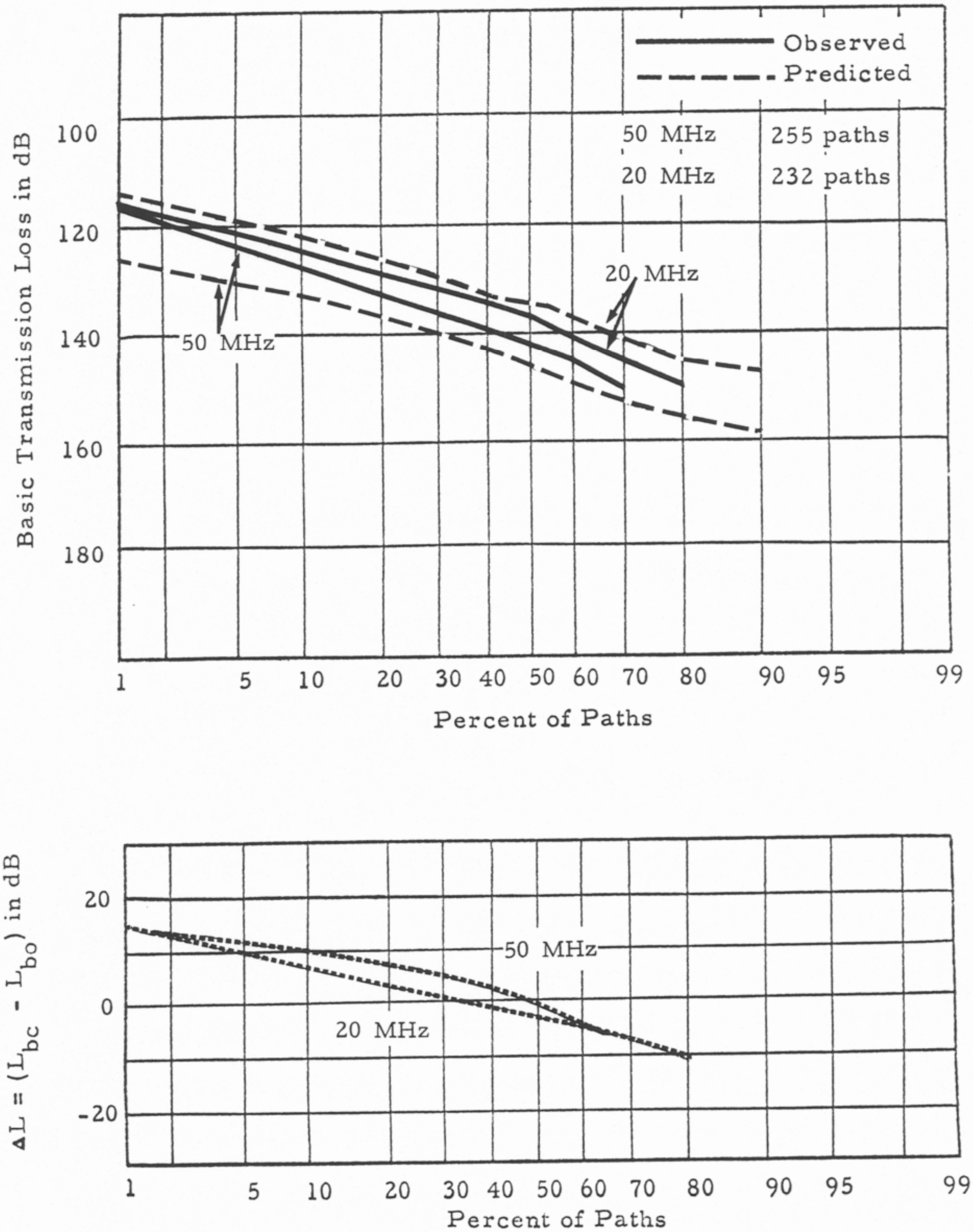


Figure 52. Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, northeastern Ohio, median Δh=95 m, f=20 and 50 MHz.

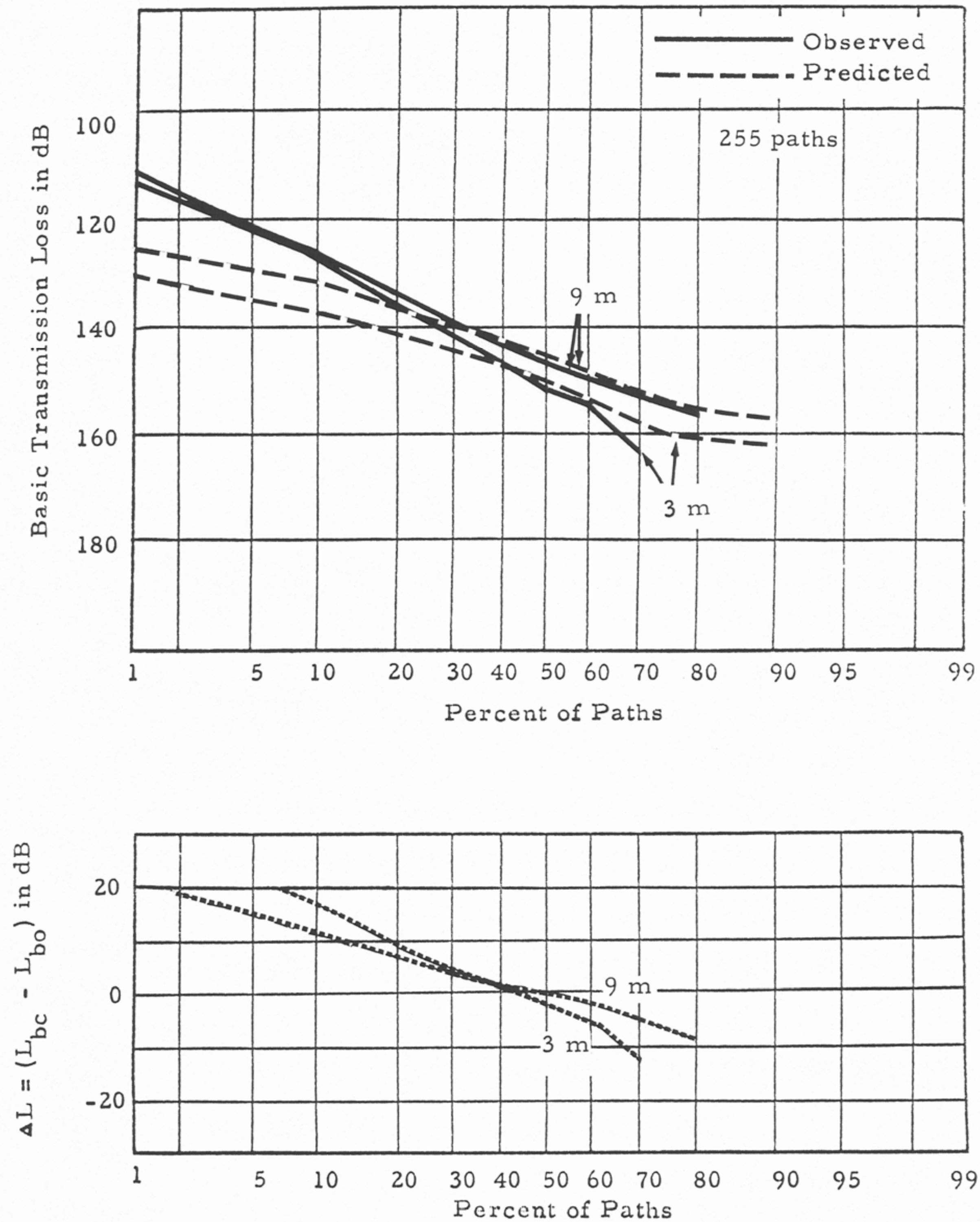


Figure 53. **Cumulative distributions of basic transmission loss, observed and predicted, and of ΔL, northeastern Ohio, median Δh=95 m, f=100 MHz.**

50 MHz are shown in a single distribution as the differences between measurements with receiver heights of 0.55 and 1.7 m were considered negligible. In figures 52 and 53 the distributions are curtailed because some of the measurement attempts failed with the signal "in the noise". In all cases good agreement between predicted and measured values is observed. The distributions of differences between predicted and observed values for individual paths show standard deviations of 8 to 10 dB, which represent the path-to-path or location variability caused by factors not considered in the prediction model.

Comparison of these figures with the area predictions shown in figures 23 through 29 show the improved agreement with measured values when individual path parameters are used in calculations rather than estimates of median values as a function of terrain irregularity and path length.

3.5 Established Communication Links

Comparisons between point-to-point predictions and the large amount of data recorded with low antennas over irregular terrain have suggested certain possible weaknesses in the prediction models described by Longley and Rice (1968). We, therefore, decided to test these models against a large amount of data collected over established propagation paths in various parts of the world. These recordings differ from those previously discussed as they represent actual established communication links that have been monitored for periods ranging from a few weeks to more than a year in some cases. This group of some 550 paths was studied, because they represent a wide range of frequencies, terrain types, path lengths, and antenna heights, and because they could be separated into large enough groups of line-of-sight, one-horizon diffraction, two-horizon diffraction, and forward-scatter paths to